

Guidance on the use of storage and access technologies impact assessment

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ico.

Information Commissioner's Office



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Executive summary

This impact assessment accompanies the ICO's updated guidance on the use of storage and access technologies (SATs). The guidance provides organisations with greater certainty on how the Privacy and Electronic Communications Regulations (PECR) and the UK GDPR apply to technologies that store or access information on user devices. Reflecting significant market, technological, and legislative developments, including changes introduced by the Data (Use and Access) Act (DUAA), the guidance aims to reduce data protection harms, support compliance, and promote responsible innovation.

As set out in the **problem definition** (Section 2), a broad range of storage and access technologies underpin many online services, from functional website features to sophisticated tools used for online advertising and analytics. Their extensive and evolving use introduces both opportunities and risks, with rapid development meaning that existing regulatory messaging may not fully reflect current technologies and practices, which has implications for regulatory clarity and certainty.

The **ICO's rationale for intervention** (Section 3) is grounded in addressing data protection harms, remedying market failures, and clarifying how regulation 6 PECR applies in a complex ecosystem. Intervention in this area aligns with the wider policy and legislative context; with the ICO well placed to provide this regulatory certainty and reduce the risk of harms materialising to users and wider society from the use of storage and access technologies.

Following an **options appraisal** (Section 4), the ICO's preferred option is a significant update to the previous 2019 'guidance on cookies and similar technologies'. This option scores highest against critical success factors and offers the greatest potential to enhance clarity, reduce uncertainty, and ensure guidance reflects current technologies. It also avoids the risks of maintaining outdated guidance in a rapidly changing environment.

The **updated guidance** as detailed within Section 5, expands the focus beyond cookies to a wider set of SATs and clarifies what organisations *must*, *should*, and *could* do to comply. It incorporates amendments to legislation brought in under the DUAA, provides new examples of compliant and non-compliant consent design, and uses clearer language throughout. These updates support the intended outcomes set out in the theory of change, including improved clarity, compliance, enhanced trust, and reduced harms.

The updated guidance is likely to have **impacts for a range of affected groups**, including online service providers, intermediaries, UK businesses that advertise online, and UK internet users. Wider societal impacts may also apply due to the pervasive use of SATs across the economy.

The core focus of Section 6 is the **assessment of costs and benefits attributable to the guidance**. Costs, primarily borne by online service providers and intermediaries, include familiarisation costs, potential implementation costs that may arise from changes to existing processes/practices, and the potential for a small number to shift toward alternative revenue models such as consent or pay. Benefits include improved clarity and understanding of the legislation, reduced long-term compliance and advisory costs, and enhanced reputational benefits through higher public trust. Users are expected to have a reduced exposure to data protection harms and increased ability to exercise their rights.

Overall, the guidance is assessed to deliver a moderate positive impact, with long-term benefits outweighing short-term costs. It clarifies the ICO's regulatory position, which should lead to improved compliance, and strengthens user trust while supporting responsible innovation. In line with Section 7, the ICO will monitor engagement with the guidance, and review feedback from organisations to ensure the guidance continues to support compliance and aligns with ongoing performance measures.

1. Introduction

This impact assessment accompanies the guidance on the use of storage and access technologies. The guidance is aimed at providers of online services, including web or app developers, who need a deeper understanding of how Privacy and Electronic Communications (PECR) regulations,¹ and data protection law (where it is relevant) apply to the use of storage and access technologies.

The ICO conducted a public consultation on the draft guidance, with an accompanying draft impact assessment, in winter 2024/25; and again, in summer 2025 following changes made to draft guidance reflecting the passage of the Data (Use and Access) Act (DUAA).^{2,3} Overall, 70 responses were received to the consultations, with 41 valid responses received through online tools and a further 29 responses received by email.⁴ Consultation feedback has been reflected throughout this impact assessment, most notably in our cost-benefit analysis in Section 6. Further detail on consultation responses can be found in Annex E.

We have made several updates to this impact assessment since the draft was published alongside the first consultation in December 2024. These revisions reflect the integration of feedback from both rounds of consultation, as well as updated evidence to account for developments in the policy landscape over this period, and in the data and statistics available both within and outside the ICO.

1.1. Our approach to impact assessment

The purpose of impact assessment is to improve regulatory interventions and policymaking by:

- informing decision-makers about potential economic, social, and (where relevant) environmental ramifications;
- providing a mechanism to consider the impact of interventions on a range of stakeholders, including different groups of citizens and organisations;

¹ UK Government (2003), *The Privacy and Electronic Communications (EC Directive) Regulations 2003*. Available at: <https://www.legislation.gov.uk/ukxi/2003/2426> (accessed April 2026).

² UK Government (2025), *Data (Use and Access) Act*. Available at: <https://www.legislation.gov.uk/ukpga/2025/18/contents> (accessed April 2026).

³ An overview of the guidance drafting process is provided in Annex A.

⁴ Six survey responses were excluded because they did not provide substantive answers to the consultation questions. For more detail see: ICO (2026), *Consultation on the updates to our storage and access technologies guidance*. Available at: <https://ico.org.uk/about-the-ico/responses-to-ico-consultations/updates-to-our-storage-and-access-technologies-guidance/> (accessed April 2026).

- improving the transparency of regulation, by explicitly setting out the intervention theory of change, and the quality of underlying evidence; and
- increasing public participation to reflect a range of considerations, improving the legitimacy of policies.

Impact assessment is also a key mechanism that helps the ICO to meet its principal objective and wider duties under Section 120A and Section 120B of the Data Protection Act (DPA) 2018.⁵

This document sets out our assessment of the anticipated impacts of the guidance on the use of storage and access technologies. We have assessed the potential impacts of the intervention using cost-benefit analysis. Our approach follows the principles set out in the ICO's Impact Assessment Framework,⁶ which in turn is aligned with HM Treasury's Green Book,⁷ and Regulatory Policy Committee guidance.⁸

1.2. Report structure

The remainder of this report is structured as follows:

- **Section 2: Problem definition** provides an overview of the problem in the context of storage and access technologies.
- **Section 3: Rationale for intervention** sets out the rationale for intervention and why the ICO is best placed to solve this problem.
- **Section 4: Options appraisal** provides a review of alternative policy options against critical success factors.
- **Section 5: Detail of proposed intervention** provides an overview of the guidance and the affected groups.
- **Section 6: Cost-benefit analysis** presents the findings of the cost benefit analysis for the guidance.
- **Section 7: Monitoring and review** outlines future monitoring considerations.
- **Annex A:** provides an overview of updates to guidance.
- **Annex B:** provides a definition of key storage and access technologies.
- **Annex C:** provides a summary of quantification of affected groups.

⁵ UK Government (2018), *Data Protection Act 2018*. Available at: <https://www.legislation.gov.uk/ukpga/2018/12/contents> (accessed April 2026).

⁶ ICO (2023) *The ICO's Impact Assessment Framework*. Available at: <https://ico.org.uk/about-the-ico/our-information/measuring-our-impact/> (accessed April 2026).

⁷ HM Treasury (2022), *The Green Book*. Available at: [The Green Book \(2022\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/the-green-book-2022) (accessed April 2026).

⁸ BEIS (2023), *Better Regulation Framework*. Available at: <https://www.gov.uk/government/publications/better-regulation-framework> (accessed April 2026).

- **Annex D:** provides more detail on how familiarisation costs are estimated to support the assessment of costs and benefits.
- **Annex E:** summarises the consultation responses.

2. Problem definition

This section defines the nature of the problem by considering developments in the technological, market, and regulatory landscape since the publication of the ICO's previous guidance. It examines how storage and access technologies are used in practice, the risks and challenges that can arise from their use, and the evidence on their prevalence and interaction within the UK. We set out how the evolved landscape and changing use have altered the scale, scope, or nature of issues, contributing to the need to reassess the existing regulatory approach.

2.1. An evolving landscape

Since publication of the 'Guidance on cookies and similar technologies' in 2019,⁹ the ICO has examined compliance issues with regulation 6 PECR and the UK GDPR in the online advertising sector, leading to a number of significant shifts in the wider regulatory landscape, these include:

- Our 2019 report on real time bidding set out a number of actions to enhance understanding around the processing of special category data without explicit consent and the complexity of the data supply chain.¹⁰
- Wider updates on positions such as on online advertising proposals,¹¹ and harmful design.¹²
- Our online tracking strategy,¹³ which has contributed to increased clarity around the use of storage and access technologies and the use of consent or pay models by online service providers, through provision of guidance and continued monitoring of the adoption of these models.¹⁴

⁹ ICO (2019), *Cookies and similar technologies*. Available at: <https://ico.org.uk/for-organisations/direct-marketing-and-privacy-and-electronic-communications/guide-to-pecr/cookies-and-similar-technologies/> (accessed April 2026).

¹⁰ ICO (2019), *Update report into adtech and real time bidding*. Available at: <https://ico.org.uk/media2/migrated/2615156/adtech-real-time-bidding-report-201906-dl191220.pdf> (accessed April 2026).

¹¹ ICO (2021) Data protection and privacy expectations for online advertising proposals. Available at: <https://ico.org.uk/about-the-ico/what-we-do/information-commissioners-opinions/> (accessed April 2026).

¹² ICO (2023), *It's time to end damaging website design practices that may harm your users*. Available at: <https://ico.org.uk/about-the-ico/media-centre/news-and-blogs/2023/08/it-s-time-to-end-damaging-website-design-practices-that-may-harm-your-users/> (accessed April 2026).

¹³ ICO (2024), *Online tracking strategy*. Available at: <https://ico.org.uk/about-the-ico/our-information/our-strategies-and-plans/online-tracking-strategy/> (accessed April 2026).

¹⁴ ICO (2025), *Our work on online tracking*. Available at: <https://ico.org.uk/about-the-ico/what-we-do/our-work-on-online-tracking/> (accessed April 2026).

- Our action on cookie compliance means that 95% of the top 1000 UK websites provide people with an option to reject non-essential cookies as easily as they can accept them.¹⁵
- A series of amendments to regulation 6 PECR brought it through the DUAA; which allow the use of SATs for certain purposes without having to obtain consent, such as those used to collect information for statistical purposes and improve the functionality of a website. DUAA also provides government with a new power to add to or change the regulation 6 PECR exceptions. This change enables the possibility that government may add further exceptions to PECR in the future.¹⁶
- We understand government is also currently exploring whether to create an exception(s) for some online advertising purposes, using secondary regulation-making powers under regulation 6A of PECR. We are engaging with industry and other stakeholders and considering responses to a 2025 call for views, to understand where the use of storage and access technologies for advertising in line with regulation 6 PECR, may currently prevent an industry-wide shift towards more privacy-friendly forms of online advertising, such as contextual models. This work will help inform government policy-making in this regard, with the outcomes of the review due to be published in spring 2026 within an upcoming letter of advice to government.

The wider market landscape around obtaining consent for the use of SATs for advertising purposes is further affected by the fragmentation of tracking technologies used by industry actors, as cookie match rates continue to decline.¹⁷ This is due to a range of factors that include the decision of some browsers to tighten or completely restrict the use of third party cookies citing privacy risks,¹⁸ and a shift toward the use of other tracking technologies by some organisations,¹⁹ with a range of increasingly sophisticated tools in widespread use.

Alternative business models have also been developed by publishers, with some adopting consent or pay models. This has in part been a response to the need to maintain revenue despite rejection of SATs, and also court proceedings in the

¹⁵ ICO (2025), *ICO action secures increased cookie compliance, giving millions stronger control over their personal information online*. Available at: <https://ico.org.uk/about-the-ico/media-centre/news-and-blogs/2025/12/ico-action-secures-increased-cookie-compliance/> (accessed April 2026).

¹⁶ UK Government (2025), *Data (Use and Access) Act*. Available at: <https://www.legislation.gov.uk/ukpga/2025/18/contents> (accessed April 2026).

¹⁷ Cookie matching is a technique used in online advertising to identify and synchronize user identities across different platforms or domains.

¹⁸ Privacy sandbox (2025), *Next steps for Privacy Sandbox and tracking protections in Chrome*. Available at: <https://privacysandbox.google.com/blog/privacy-sandbox-next-steps> (accessed April 2026).

¹⁹ IAPP (2023), *The half-baked future of cookies and other tracking technologies*. Available at: <https://iapp.org/resources/article/future-of-cookies-tracking-technologies/> (accessed April 2026).

EU²⁰ and the implementation of the Digital Markets Act.²¹ This issue has also attracted regulatory scrutiny in the UK,²² where adoption has been led by news publishers.²³

In this evolving technological and market landscape, there is a **risk that existing regulatory guidance no longer provides sufficient clarity or certainty**. Reduced regulatory certainty can make it harder for organisations to understand and meet their obligations, increasing the likelihood of inconsistent practices and potential harms. Maintaining regulatory clarity helps enable compliance and creates a more predictable environment in which organisations can plan, invest, and operate effectively. Against this backdrop, the **ICO has a role in assessing whether changes in the landscape have created gaps or ambiguities that warrant further regulatory consideration or intervention**.

2.2. Use of storage and access technologies within the UK

To further inform our understanding of the issues arising from the use of storage and access technologies we have carried out desk research looking at both the use of storage and access technologies by online service providers and interaction with these technologies by service users.

2.2.1. What are storage and access technologies?

The 2019 guidance on the use of 'cookies and similar technologies', was aimed at those who 'operate an online service, such as a website or a mobile app, and need a deeper understanding of how PECR applies to your use of cookies.' This guidance applied to a broad range of storage and access technologies that can be used to store information, or accesses information that is stored on a subscriber or user's 'terminal equipment' (for instance a smartphone or laptop). This includes, but is not limited to:²⁴

- cookies;
- tracking pixels;
- link decoration and navigational tracking;
- scripts and tags;

²⁰ ECJ (2023), *Meta Platforms Inc and Others v Bundeskartellamt*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62021CJ0252> (accessed April 2026).

²¹ EU Commission (2025), *Commission finds Apple and Meta in breach of the Digital Markets Act*. Available at: https://digital-markets-act.ec.europa.eu/commission-finds-apple-and-meta-breach-digital-markets-act-2025-04-23_en (accessed April 2026).

²² ICO (2024), *Consent or pay*. Available at: <https://cy.ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/online-tracking/consent-or-pay/> (accessed April 2026).

²³ ICO (2024), *Consent or pay impact assessment*. Available at: <https://ico.org.uk/media2/migrated/4032418/consent-or-pay-impact-assessment.pdf> (accessed April 2026).

²⁴ More detailed definitions of these technologies can be found in Annex B.

- web storage; and
- device fingerprinting.

2.2.2. Use of SATs by online service providers

Due to limitations in the data available and rapid developments in online tracking and technologies, it is difficult to state definitively how many online service providers use storage and access technologies. It should also be noted that the online service providers relevant to this analysis span a wide range of sectors, which in turn interact with a wide range of users. This means that it is not possible to provide a robust estimate of the size and scale of supply or demand. Given these evidence limitations the figures we have gathered are only intended to provide an approximation of the scale of storage and access technologies related activity in the UK. We summarise the evidence presented in this section in Annex C for clarity.

The 2019 guidance notes that 'if you are running an online service, it is likely that you are operating an information society service (ISS)' which is defined within EU legislation as 'any service normally provided for remuneration, at a distance, by electronic means and at the individual request of a recipient of services'.²⁵ Essentially this means that most online services are ISS, including apps, programs and many websites.

Recently commissioned ICO research estimates that the number of ISS providers in the UK economy ranges between 22,500 and 65,000. This is based on a range of 14 to 21% of UK businesses with a 'distinct Real-Time Industrial Classification' (RTIC).^{26,27}

Given the research noted above, we note that a mid-point of **around 43,700 online service providers are estimated to use cookies or other storage and access technologies.**

Use of storage and access technologies

A full breakdown of the numbers of online service providers using individual types of storage and access technology to track user information is not readily

²⁵ EU (2015), *Directive (EU) 2015/1535*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015L1535> (accessed April 2026).

²⁶ The research relied on the RTICs offered by Data City as the primary data source rather than the Standard Industrial Classification (SIC) codes to assess sectors with heavy technology focus and estimate the number of UK-based ISS providers. The total estimated number of active UK businesses with distinct RTIC classification noted within the research is 163,894 firms, which excludes sole traders and those under a certain threshold.

²⁷ ICO (2026), *Information Society Services (ISS) research*. Available at: <https://ico.org.uk/about-the-ico/research-reports-impact-and-evaluation/research-and-reports/information-society-services-iss-research/> (accessed April 2026).

available. However, there were approximately 66,500 separate detections of analytics and tracking (using storage and access technologies) among the top 10,000 websites in the UK as of March 2026.²⁸ A range of research sources illustrate that up to 73% of websites in the UK use link decoration,²⁹ while around 4% of websites in the UK use tags.³⁰ Evidence from the Business Data Survey (BDS)³¹ also suggests that 9.2% of organisations that gather personal data (approximately 2,500 online service providers) do so through the use of cookies placed on users' connected devices. However, this appears likely to be an underestimate because it is based on businesses' self-reporting and understanding of their use of storage and access technologies. It should also be noted that online services are likely to use more than one of these storage and access technologies and so these estimates are not mutually exclusive.

Figure 1 gives an illustration of the range of estimates found during our research for a number of key tracking technologies. When applied to the estimated number of online service providers the estimates illustrate that a range of between 2,500 and 32,000 online service providers could be using the various tracking technologies noted.

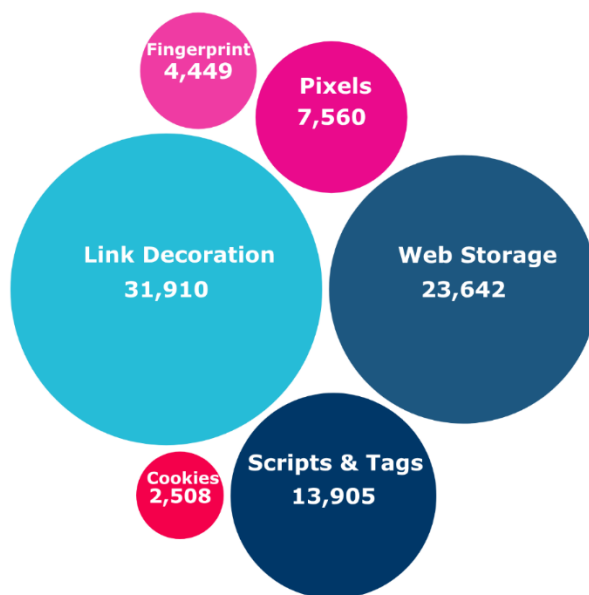
²⁸ Built with data (2024) *Analytics Usage Distribution in United Kingdom*. Available at: <https://trends.builtwith.com/analytics/country/United-Kingdom> (accessed April 2026).

²⁹ Munir et al. (2023), *PURL: Safe and Effective Sanitization of Link Decoration*. Available at: https://www.researchgate.net/publication/372961970_PURL_Safe_and_Effective_Sanitization_of_Link_Decoration (accessed April 2026).

³⁰ Built with data (2024), *Analytics Usage Distribution in United Kingdom*. Available at: <https://trends.builtwith.com/analytics/country/United-Kingdom> (accessed April 2026).

³¹ DSIT (2024), *UK Business Data Survey*. Available at: <https://www.gov.uk/government/statistics/uk-business-data-survey-2024/uk-business-data-survey-2024> (accessed April 2026).

Figure 1: Estimated number of online service providers using various tracking technologies



Source: ICO analysis using a number of sources.^{29,30,31,32,33,34}

Research illustrates an increase in the practice of 'relying on first-party cookies that are set by third-party intermediaries to implement user tracking and other potentially unwanted capabilities'.³⁴ While further research suggests that over 80 third parties, on average, have access to data within seconds of a user opening a web page.³⁵ This highlights the scale and complexity of third-party data access and the potential difficulty for users in understanding which parties are involved when they provide consent.

Intermediaries include businesses that provide services to either UK businesses that advertise or UK online service providers or both. This group includes a wide range of services, including analytics service providers, ad-servers, supply and demand side platforms, ad-verification services, data management platforms, consent management platforms, ad exchanges, and ad networks.

The numbers of external intermediaries operating within the UK is difficult to quantify. However, the IAB lists around 840 businesses on its register of vendors

³² Ahmad et al. (2023), *An Empirical Analysis of Web Storage and Its Applications to Web Tracking*. Available at: <https://dl.acm.org/doi/10.1145/3623382#sec-4-3> (accessed April 2026).

³³ Iqbal et al. (2021), *Fingerprinting the Fingerprinters*. Available at: <https://arxiv.org/abs/2008.04480> (accessed April 2026).

³⁴ Chen et al. (2021), *Cookie Swap Party: Abusing First-Party Cookies for Web Tracking*. Available at: <https://www3.cs.stonybrook.edu/~mikepo/papers/firstparty.www21.pdf> (accessed April 2026).

³⁵ Warwick Business School (2024), 'How websites deceive users on data sharing'. Available at: <https://www.wbs.ac.uk/news/websites-deceive-users-data-sharing/#:~:text=This%20pervasive%20surveillance%20raises%20significant,average%20have%20accessed%20your%20information> (accessed April 2026).

(noted to include ad servers, measurement providers, advertising agencies, consent management platforms and others).³⁶ We explore this estimate further in Section 5.4.

Wider use of storage and access technologies within the online advertising sector

While we know that organisations use information on how visitors use their website to inform service improvements, we also know that this information can be used to track users with a view to providing online advertising.

The online advertising market is based on the sale of advertising space by online service providers to other organisations wishing to target consumers of that online service. Advertising is increasingly being placed online, with online advertising accounting for around 80% of total advertising spend in 2022 (a 25% increase on the previous year).³⁷

According to industry research around 81% of SMEs that use paid-for online advertising say it is important to their business success, with around two thirds of UK SMEs having used some form of paid online advertising in the last year.³⁸ While this research doesn't analyse the use of online advertising by large businesses, it is likely that the proportion of businesses that advertise online increases with size, therefore we could assume 99% of large businesses currently operating the UK are likely to be active online advertisers.

There are approximately 2.7 million businesses currently considered 'live' in the UK,^{39,40} while applying the estimates of online advertising use above to the breakdown of SME and large firms gives an estimate of 1.8m of these businesses that are likely to advertise online.

This provides an estimate of **1.8m UK businesses that advertise online.**

³⁶ IAB (2025), *Vendors List*. Available at: <https://iabeurope.eu/vendor-list/> (accessed April 2026).

³⁷ Advertising Association (2022), *UK ad spend grew 8.8% in 2022 to reach £34.8bn*. Available at: <https://adassoc.org.uk/our-work/uk-ad-spend-grew-8-8-in-2022-to-reach-34-8bn-inflationary-pressures-persist-with-minimal-growth-forecast-for-2023/> (accessed April 2026).

³⁸ IAB (2025), *Powering up report*. Available at: https://www.iabuk.com/sites/default/files/public_files/IAB%20UK%20Powering%20Up%20Report%202025_0.pdf (accessed April 2026).

³⁹ *Live businesses are those that were paying Value Added Tax (VAT) and/or Pay As You Earn (PAYE) as of March 2026.*

⁴⁰ ONS (2025), *UK Business Counts*. Available at: <https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/bulletins/ukbusinessactivitysizeandlocation/2025> (accessed April 2026).

User interaction with storage and access technologies.

While it is not possible to obtain evidence on user interaction with individual storage and access technologies, research does suggest that around 95% of the population in the UK aged over 16 (around 57 million people) have access to the internet.^{41,42} Due to the high incidence of use of storage and access technologies across websites noted above, we can assume that all those that use the internet will, at some point, come across these technologies.

Research commissioned by the ICO in 2024 asked UK adults (aged 18+) whether they 'normally accept or reject the cookies when visiting a new website?'. Responses illustrated that just below half (48%) of UK adults accept the cookies, while about a fifth (21%) reject them, and 24% decide based on the website.⁴³ While this evidence could suggest that only a proportion of online service users may interact with SATs, consumer concerns around cookies (and other storage and access technologies) that have been reported to the ICO, as well as wider research studies,⁴⁴ suggest that non-compliance with the legislative requirements for valid consent remains an issue for some consumers. Issues noted include the lack of an option to decline tracking as required in legislation and lack of clarity on the specific scope of consent requested. We can therefore assume that all online service users in the UK are likely to engage with SATs at some point.

This provides an estimate of **57m people in the UK that are likely to engage with SATs.**

The ICO commissioned research also found that:

- **People often don't read privacy information:** 40% of adults never read 'cookie preferences, policies or settings' when visiting new websites, while 56% read them, indicating growing awareness of online privacy practices.
- **People often want privacy information to be clear and simple to understand:** 53% of adults would prefer a short and concise version

⁴¹ Ofcom (2025), *Online Nation 2025 Report*. Available at: <https://www.ofcom.org.uk/siteassets/resources/documents/research-and-data/online-research/online-nation/2025/online-nations-report-2025.pdf?v=409837> (accessed April 2026).

⁴² ONS (2025), *Estimates of the population for the UK*. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesandscotlandandnorthernireland> (accessed April 2026).

⁴³ ICO (2024), *Cookies and Online Privacy Omnibus*. Available at: <https://ico.org.uk/media2/warm3yrh/cookies-omnibus-summary-of-findings.pdf> (accessed April 2026).

⁴⁴ Paci, Pizzoli and Zannone (2023), *A Comprehensive Study on Third-Party User Tracking in Mobile Applications*. Available at: <https://dl.acm.org/doi/pdf/10.1145/3600160.3605079> (accessed April 2026).

of the information, with 46% preferring that simple, clear language is used.

- **People often care about their data being shared, but their actions don't always reflect this:** 44% of adults reported sharing more personal information than they would like at least once a week in the past month, while 21% reported doing so at least once a day.
- **People appreciate the relevance of personalised online advertising but also often want more data privacy:** 56% of adults surveyed wanted to 'give organisations less information about themselves and receive less advertising', 25% wanted to give more of their information for more relevant advertising and 18% had 'no opinion' on the subject.

These factors have the potential to lead to a loss of control for online service users, as they may prevent users from being offered a meaningful choice as to whether their personal information is used for non-exempt purposes, including personalised advertising.⁴⁵ According to the research, younger adults, men, and higher socio-economic groups tend to feel more informed and in control, though a significant share of people still feel they have little control and report giving more personal information than they would like in order to access websites. The ICO Data Lives research also found that both children and adults struggle to understand how companies use their personal information.⁴⁶ In addition, similar research carried out on children found that framing and language of privacy information/consent requests was often beyond what they could understand.⁴⁷

The analysis above shows the **complexities of how storage and access technologies are used in practice, the risks and challenges that can arise from their use**, and the evidence on their prevalence and interaction within the UK.

2.3. Summary of problem definition

We set out above how the evolved landscape and changing use of storage and access technologies have altered the scale, scope, and nature of issues set out in our 2019 intervention contributing to the need to reassess our existing regulatory approach.

Online service providers use storage and access technologies for a series of wide ranging purposes, from remembering what a user has added to their shopping

⁴⁵ ICO (2024), *Cookies and Online Privacy Omnibus*. Available at: <https://ico.org.uk/media2/wworm3yrh/cookies-omnibus-summary-of-findings.pdf> (accessed April 2026).

⁴⁶ ICO (2025), *Data Lives research* <https://ico.org.uk/about-the-ico/research-reports-impact-and-evaluation/research-and-reports/views-of-the-public/> (accessed April 2026).

⁴⁷ ICO (2025), *Children's Data Lives research*. Available at: <https://ico.org.uk/about-the-ico/research-reports-impact-and-evaluation/research-and-reports/views-of-the-public/> (accessed April 2026).

basket to complying with the security requirements of data protection law (eg for online banking services). They are also widely used for online advertising purposes.

The use of storage and access technologies has the potential to provide benefits for both the user and the online service provider.⁴⁸ However, the use of these technologies, and subsequent processing of personal data, has the potential to result in data protection harms such as the loss of control of personal information, as well as the potential for financial and psychological harms. These harms are discussed in more detail in Section 3.

Problem statement: Since the publication of the ICO's 2019 guidance on cookies and similar technologies, the storage and access technologies market and the wider ecosystem have continued to evolve, including legislative change linked to DUAA. Technological innovation, changes in business practices, and shifts in the broader market mean that existing regulatory messaging may not fully reflect how these technologies are currently deployed in practice. This creates a risk of reduced regulatory clarity and certainty, both for organisations seeking to comply and for individuals affected by the use of such technologies.

⁴⁸ These are providers of online services, including web or app developers.

3. Rationale for intervention

This section sets out the rationale for intervention. We illustrate the potential data protection harms and market failures that this intervention seeks to address and provide an overview of the wider political and legislative context around the use of storage and access technologies.

3.1. Data protection harms

This section provides some illustrative examples of data protection harms that can result from the use of storage and access technologies.^{49,50}

3.1.1. Financial, bodily and psychological harm

The use of storage and access technologies can increase the risk of data protection harm to consumers. Where data is subject to hacking or a breach, personal user information could be made public that has the potential to cause financial harm, as well as psychological distress and or bodily harm.

Financial harm could be experienced where personal information obtained through storage and access technologies is used to target advertising at users, through encouraging negative purchasing habits or exploiting financial vulnerabilities through marketing of high interest loans. Psychological harm could range from fatigue and irritation about consent banners to fears of social exposure where sensitive information has been used to target someone with adverts. There could be risk of bodily harm where users' are subjected to medical misinformation or the misuse of personal information to cause bodily harm.

Example: Disclosure of private health information causes psychological distress and financial harm

Following a new diagnosis of a medical condition, a user visits the website of a charity dedicated to that condition. The charity uses a third-party tag provided by a social media platform to track user activity on their site which will be used to improve the performance of advertising campaigns on the social media platform.

When the user visits a page on the website containing resources for people who have just been diagnosed with the condition, the page visit is captured by the tag; and later when using a social media platform, they see an advert for

⁴⁹ ICO (2022), *Overview of DP Harms and the ICO's Taxonomy*. Available at: <https://ico.org.uk/about-the-ico/research-reports-impact-and-evaluation/research-and-reports/data-protection-harms/> (accessed April 2026).

⁵⁰ This is a non-exhaustive list for illustrative purposes.

another charity relating to the same health condition.

This causes psychological stress and a fear of exposure to their friends and family. In addition, they are later marketed for wellness products that help with symptoms associated with their condition, which they consider purchasing. This could lead to financial or physical harms if the person chooses to take products that they don't need, or which could interfere with their prescribed treatment.

3.1.2. Unwanted intrusion and loss of control of personal information

The use of storage and access technologies to track users, such as for online advertising purposes, can lead to unwanted intrusions for users. This can include unwanted communications that disturb tranquillity, interrupt activities, sap time or increase the risk of other harms occurring, for instance unwanted targeted advertising, nuisance calls or spam or unwarranted surveillance. Loss of control of personal information can lead to harms stemming from the misuse, repurposing, unwanted retention or continued use and sharing of personal information, including a lack of commitment to the accuracy of information or lack of transparency. Restrictions on ability to access or review use of personal information or incompatible repurposing can lead to users experiencing emotional and psychological distress as well as increasing the risk of additional harms such as financial harms depending on the repurposed use of information.

Example: Alcohol addiction treatment firm disclosed user's personal health information to third-party advertising platforms.

In 2024 the Federal Trade Commission (FTC) acted against an alcohol addiction treatment service for allegedly disclosing users' personal health information to third-party advertising platforms, including Meta and Google, for advertising without consumer consent; after promising to keep such information confidential.⁵¹

Monument specified that it disclosed Custom Events containing health information to third-party advertising platforms for as many as 84,000 people, although this number was an estimate as it did not adequately track the information collected and disclosed.

Disclosure of this information had the potential to cause psychological harms including stigma, embarrassment, and emotional distress to the users. It could also have led to financial harms through the ability to obtain and/or retain

⁵¹ FTC (2024), *Alcohol Addiction Treatment Firm will be Banned from Disclosing Health Data for Advertising to Settle FTC Charges that It Shared Data Without Consent*. Available at: <https://www.ftc.gov/news-events/news/press-releases/2024/04/alcohol-addiction-treatment-firm-will-be-banned-disclosing-health-data-advertising-settle-ftc> (accessed April 2026).

employment, housing, health insurance, or disability insurance.

3.2. Market failures

The use of storage and access technologies has the potential to create several market failures. A lack of clarity about how to meet regulation 6 PECR and UK GDPR requirements leads to **imperfect information**, driving up organisational costs through legal advice, compliance efforts, or potential regulatory penalties. Consumers may also face information overload, resulting in disengagement and poorer decision-making. Uncertainty about what privacy information should be provided can weaken user's understanding of how their data is used, eroding trust and discouraging them from sharing information or using services. This, in turn, reduces the perceived effectiveness and value of personal data-driven online advertising models.

The widespread use of these technologies for advertising also contributes to **information asymmetry** and **principal-agent problems**, where advertisers or processors hold more knowledge about user behaviour than users themselves. This imbalance can expose users to exploitation and harm. Additionally, unclear responsibility across the ecosystem, particularly where data is shared with third parties or consent processes are outsourced, can generate negative externalities. Organisations may overlook the broader impacts of non-compliance, including insufficient security measures, which increase the likelihood of data protection breaches and impose wider societal costs.

As the UK's data protection regulator, the ICO is well placed to provide regulatory certainty and address these market failures.

3.3. Policy and legislative context

It is important to consider the wider policy context surrounding our problem definition to assess alignment with the rationale for intervention. This includes both internal ICO policy but also wider initiatives such as government policy.

3.3.1. Policy context internal and external

The online tracking strategy⁵² sets out the ways in which the ICO will promote compliance with the law to obtain a fairer online tracking ecosystem for people and business, including:

- clarifying how the law applies and our expectations in guidance and other publications;

⁵² ICO (2024), *Online tracking strategy*. Available at: <https://ico.org.uk/about-the-ico/our-information/our-strategies-and-plans/online-tracking-strategy/> (accessed April 2026).

- engaging with industry to shape a more compliant and privacy-oriented ecosystem;
- scrutinising the compliance of organisations across the online tracking ecosystem; and
- investigating and enforcing against organisations that do not comply.

Intervention in this space also aligns with the ICO strategy in helping to safeguard and empower consumers while also providing the regulatory certainty needed to help those we regulate plan, invest and innovate confidently.⁵³

In a wider global context, the European Commission's recent Digital Omnibus proposals also suggested changes to how the use of storage and access technologies is regulated in the EU.⁵⁴

3.3.2. Legislative context

Relevant legislation on the use of SATs includes regulation 6 PECR,⁵⁵ UK GDPR,⁵⁶ and the Data Protection Act 2018 (DPA 2018),⁵⁷ including recent amendments brought in through the DUAA.⁵⁸ These laws control how organisations, businesses or the government use personal information.

3.4. Summary of rationale for intervention

In summary, a lack of regulatory certainty has the potential to contribute to a number of data protection harms and market failures, such as the loss of control of personal information. Intervention in this area aligns with the wider policy and legislative context, with the ICO well placed to provide this regulatory certainty and reduce the risk of harms materialising to users and wider society from the use of storage and access technologies.

⁵³ ICO (2026), [Our strategies and plans | ICO](#).

⁵⁴ EU (2025), *Digital Omnibus Regulation Proposal*. Available at: <https://digital-strategy.ec.europa.eu/en/library/digital-omnibus-regulation-proposal> (accessed April 2026).

⁵⁵ UK Government (2003), *The Privacy and Electronic Communications (EC Directive) Regulations 2003*. Available at: <https://www.legislation.gov.uk/ukxi/2003/2426> (accessed April 2026).

⁵⁶ UK Government (2016), *UK General Data Protection Regulation*. Available at: <https://www.legislation.gov.uk/eur/2016/679/contents> (accessed April 2026).

⁵⁷ Data Protection Act 2018. Available at: <https://www.legislation.gov.uk/ukpga/2018/12/contents/enacted> (accessed April 2026).

⁵⁸ UK Government (2025), *Data (Use and Access) Act*. Available at: <https://www.legislation.gov.uk/ukpga/2025/18/contents> (accessed April 2026).

4. Options appraisal

This section provides an overview of the options considered in response to the problem defined in Section 2 and the rationale for intervention identified in Section 3. In doing so the ICO has a range of regulatory tools that can be deployed where appropriate, including:

- Guidance and regulatory expectations;
- Codes of practice;
- Supervisory engagement;
- Audits and upstream monitoring;
- Advice and sandbox functions; and
- Enforcement powers.

Identifying appropriate regulatory tools formed part of the Online Tracking Strategy, which committed the ICO to enhancing regulatory certainty by publishing final guidance on storage and access technologies. Accordingly, the options presented below focus on guidance-based intervention as a means of addressing the lack of regulatory certainty described in Section 2, and the related harms and market failures discussed in Section 3.

4.1. Options for consideration

We have considered the following options for intervention:

- **Option 1: Business as usual (BAU):** Do not update the previous version of the detailed cookies guidance, published in 2019.
- **Option 2: Provide a significant update to guidance (preferred option):** Provide a significant update to the detailed cookies guidance, that will:
 - Clarify and expand on established policy positions where we can provide further regulatory certainty.
 - Provide equal weight to “similar technologies” (such as web storage and scripts and tags) alongside cookies by renaming the guidance products and providing new examples.
 - Provide clarity by incorporating stylistic best practice and must / should / could framework.
- **Option 3: Provide a light update to guidance (do less):** Provide a light update to the detailed cookies guidance, that will:
 - Provide clarity by using the new style guide and must / should / could framework.
- **Option 4: Provide sector specific guidance (do more):** Provide sector specific guidance and/ or detailed device-specific guidance (ie a portfolio of multiple guidance products).

4.2. Assessment of options

In line with HM Treasury guidance,⁵⁹ we assessed the options against the following critical success factors (CSFs):

- **Strategic alignment:** considers how options fit with ICO objectives, strategy, and the wider policy landscape.
- **Affordability:** covers the financial impacts of options, including the cost for the ICO of delivering and maintaining these (e.g. staff time and other resources).
- **Achievability:** considers the viability of options as long-term solutions, and whether further action is likely to be required in the future.
- **Risks:** reflects the risks posed to the ICO, including legal and reputational risks.
- **Impacts:** considers whether options have a positive or negative impact on affected groups (including whether options reduce regulatory uncertainty or impose additional costs).

A degree of judgement is used to score options against each of these factors. Accordingly, the assessment should be viewed as indicative. Options have been assigned a red, amber, green (RAG) rating for each CSF.

Table 1: Assessment of options

Option	Strategic alignment	Affordability	Achievability	Risks	Impacts
Option 1 (BAU)	Low (-)	High (+)	High (+)	High (-)	Medium
Option 2 (preferred option)	High (+)	Medium	Medium	Medium	High (+)
Option 3 (do less)	Medium	Medium	Medium	High (-)	Medium
Option 4 (do more)	High (+)	Low (-)	Low (-)	Low (+)	High (+)

Source: ICO analysis.

The preferred option of **a significant update to guidance** has no red ratings, and two out of five criteria are assessed as green. This option rates highly in relation to strategic alignment and potential impact; while having a medium rating across affordability, achievability and risk factors. This is the highest

⁵⁹ HM Treasury (2026), *The Green Book*. Available at: <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government/the-green-book-2020> (accessed April 2026).

scoring option with all others either having red ratings or no greens and, as such, this is deemed the most appropriate option to progress.

The preferred option aligns with ICO objectives and the external policy environment. The upfront cost to the ICO of producing guidance is expected to be offset by the impact of increased regulatory certainty for organisations and the reduced potential for data protection harms. The preferred option ensures that guidance on storage and access technologies reflects the current use of technology and reduces legal and reputational risks.

5. Detail of proposed intervention

This section provides an overview of the preferred option for the guidance intervention identified in Section 4 and its objectives. It also sets out a theory of change for the guidance, which covers:

- the change the guidance is expected to bring about; and
- the causal chain of events that are expected to bring about that change.

The section concludes by providing an overview of the main groups expected to be impacted by the guidance.

5.1. The guidance

The guidance is a significant update to the previous 2019 'guidance on the use of cookies and similar technologies'. It is aimed at providers of online services, including web or app developers, who need a deeper understanding of how PECR applies to the use of storage and access technologies. The guidance also covers UK GDPR, where the use of these technologies involves the processing of personal data. It provides greater regulatory certainty by setting out what organisations must, should, and could do to comply with legislative requirements within the ICO's remit or relevant established case law.

Specifically, in order to address the issues outlined in Sections 2 and 3 the guidance aims to:

- Provide equal weight to storage and access technologies other than cookies (such as web storage and scripts and tags), to reflect current practices and legislation. This includes renaming the guidance and adding new sub-sections and examples.
- Clarify and expand on established policy positions where the ICO can provide further clarity. For example, our expectations around withdrawal of consent.
- Reflect changes to PECR following the DUAA, including addition of a new chapter on 'what are the exceptions', along with minor changes throughout the guidance to reflect the updated rules.
- Include new examples of 'good' and 'bad' practice consent mechanism designs, building on the harmful design practices work with the CMA, our observations of common practice, and feedback from stakeholder consultations.

- Provide regulatory clarity to readers through the use of 'must', 'should', or 'could' language.⁶⁰

The following topics are covered within the guidance:

- About this guidance
- What are storage and access technologies?
- What are the PECR rules?
- What are the exceptions?
- How do the PECR rules relate to the UK GDPR?
- How do we comply with the PECR rules?
- How do we manage consent in practice?
- How do the rules apply to online advertising?
- What happens if we don't comply?
- Glossary

5.1.1. Overarching objectives

The overarching objective of the guidance is the provision of **regulatory certainty**:

- on compliant practices for using SATs on a device;
- in the application and use of consent mechanisms where required; and
- regarding ICO expectations when organisations are using SATs.

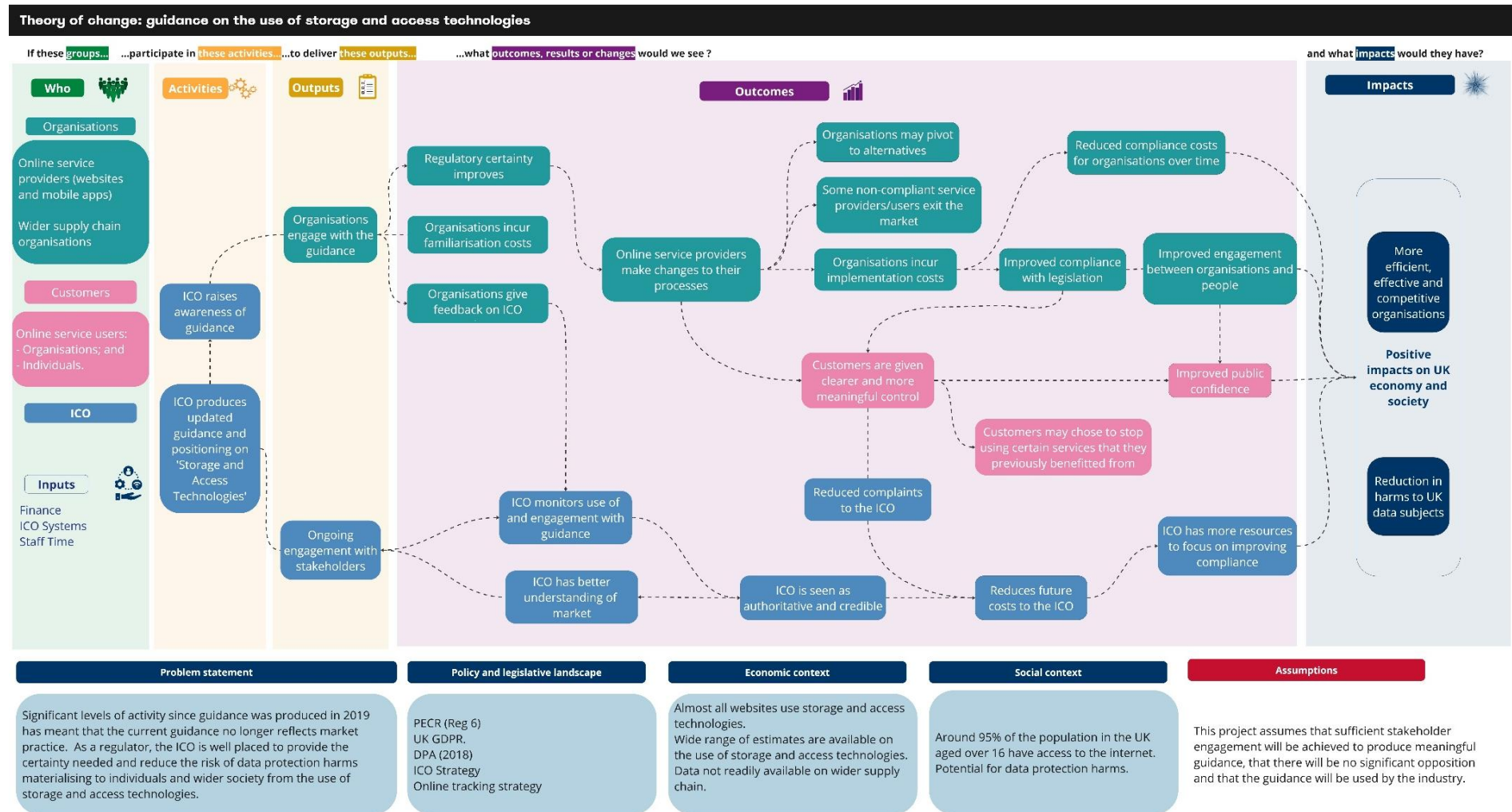
These objectives align with the problem identified and the rationale for intervention outlined earlier in this document.

5.1.2. Theory of change

Our impact assessment is underpinned by an 'output to outcome to impact' methodology, called a theory of change. This shows how guidance can link to a chain of results that lead to the intended impacts. Our theory of change is shown in Figure 1 overleaf.

⁶⁰ The ICO's 'must, should and could' approach makes a clear distinction between legislative requirements (must), what ICO expects organisations to do to comply with the law (should), and options or examples that organisations could consider, to help them comply with the law (could).

Figure 1: Guidance on the use of storage and access technology – theory of change



Source: ICO analysis.

5.2. Scope of guidance

The guidance is primarily aimed at online service providers that use storage and access technologies, as well as web or app developers who need a deeper understanding of how PECR applies to the use of storage and access technologies.

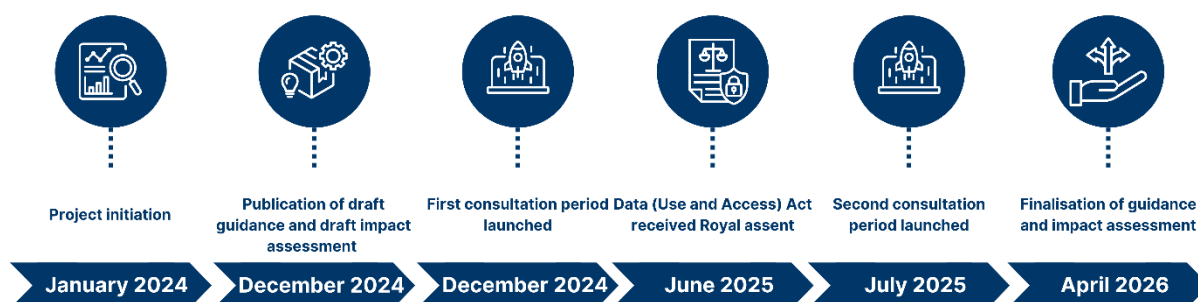
The guidance explains how PECR and UK GDPR (where the use of these technologies involves the processing of personal data), apply when you use technologies that store information, or access information stored, on someone's device. The guidance gives an overview of the changes so that readers can easily navigate the updates made and also provides a definition of storage and access technologies; outlines the rules of PECR and how they relate to UK GDPR; illustrates how online service providers can comply with the rules and management of consent; and provides some 'good' and 'bad' practice examples.

The guidance does not cover requirements of the PECR outside of regulation 6, except where relevant to the use of storage and access technologies. Nor does it cover wider compliance obligations with the Data Protection Act (DPA) and UK GDPR when using storage and access technologies, except for where they are relevant to regulation 6 PECR requirements.

5.3. Guidance timeline

Figure 2 shows some of the key milestones in the development of the guidance.

Figure 2: Timeline of key milestones linked to the guidance



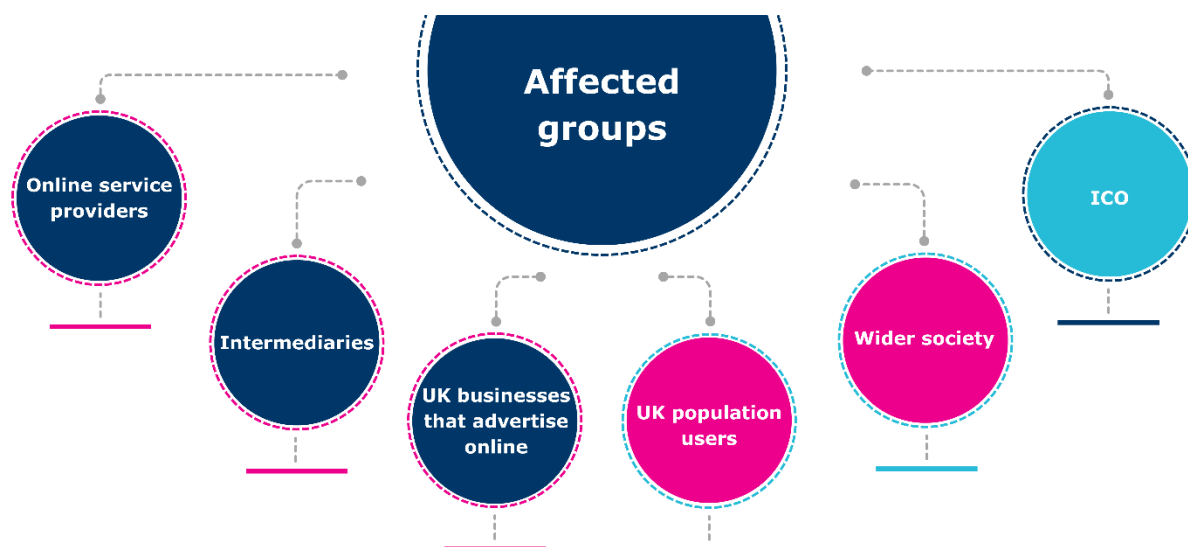
Source: ICO analysis.

5.4. Affected groups

The main groups we expect to be affected by the guidance are outlined in Figure 3 below. There are a number of challenges with quantifying the scale of affected groups, including a lack of robust data and evidence as noted in Section 2.2. This section also reflects feedback gathered in the consultation process. For a summary of the consultation and our response see Annex E.

The use of storage and access technologies spans across all sectors with an online presence. This has meant that it is difficult to use official UK statistics and data on businesses and other groupings (such as industry classification codes which can be used to identify market size) to inform our understanding of likely affected groups, therefore we have had to rely on other sources such as external research and surveys, as noted in Section 2.2 and summarised in Annex C.

Figure 3: Key groups with the potential to be affected by guidance on the use of storage and access technologies.



Source: ICO analysis.⁶¹

5.4.1. Online service providers: that use storage and access technologies

The guidance is expected to primarily affect all online service providers (as defined in Section 2.2) and who use these technologies; as well as web or app developers, who need a deeper understanding of how PECR applies to the use of storage and access technologies.

According to the guidance, 'if you are running an online service, it is likely that the service is an Information society service (ISS)'.^{62,63} This includes providers of apps, programs and many websites including search engines, social media platforms, online marketplaces, content streaming services (eg video, music or gaming services), online games, news or educational websites, and any websites offering other goods or services to users over the internet.

⁶¹ It should be noted that some businesses are likely to fall under more than one category of affected group.

⁶² According to EU the definition of an ISS: 'Information Society service, that is to say, any service normally provided for remuneration, at a distance, by electronic means and at the individual request of a recipient of services.'

⁶³ EU (2015), Directive - 2015/1535. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015L1535> (accessed April 2026).

As noted in Section 2.2 and further illustrated in Annex C, while it is difficult to accurately measure the number of online service providers operating within the UK that use storage and access technologies, we can provide estimates using a range of sources. Recently commissioned ICO research estimates that the number of ISS providers in the UK economy ranges between 22,500 and 65,000.⁶⁴

With around 98% of all websites estimated to use cookies, we can assume that almost all of these online service providers (43,000) are using cookies (or another type of storage and access technology).⁶⁵ A review of available evidence on the usage of other types of storage and access technologies indicates that this could be taken as a conservative estimate of usage as a whole.

This provides a mid-point estimate of **43,000 online service providers** operating in the UK that are using cookies or another storage and access technology.

5.4.2. Intermediaries: businesses within the supply chain of online service providers

This group includes businesses within the supply chain of online service providers and interact with or assist in the collection and processing of information stored and/or accessed by online services that use storage and access technologies. Intermediaries include businesses that provide services to either UK businesses that advertise or UK online service providers or both. This group includes a wide range of services, including ad-servers, supply and demand side platforms, ad-verification services, data management platforms, consent management platforms, ad exchanges, and ad networks.

The numbers of external intermediaries operating within the UK is difficult to quantify. However, the IAB lists around 840 businesses on its register of vendors (noted to include ad servers, measurement providers, advertising agencies, consent management platforms and others).⁶⁶ This could be considered to illustrate the upper end of this scale, while the impact assessment accompanying DSIT's consultation on the Online Advertising Programme⁶⁷ estimated that the

⁶⁴ ICO (2026), *Information Society Services (ISS) research*. Available at: <https://ico.org.uk/about-the-ico/research-reports-impact-and-evaluation/research-and-reports/information-society-services-iss-research/> (accessed April 2026).

⁶⁵ Chen et al. (2021), *Cookie Swap Party: Abusing First-Party Cookies for Web Tracking*. Available at: <https://www3.cs.stonybrook.edu/~mikepo/papers/firstparty.www21.pdf> (accessed April 2026).

⁶⁶ IAB (2025), *Vendors List*. Available at: <https://iab europe.eu/vendor-list/> (accessed April 2026).

⁶⁷ DSIT (then DCMS) (2022), *Impact assessment: Consultation on reviewing the regulatory framework for online advertising in the UK: The Online Advertising*

number of key market players considered to be intermediaries is around 70 businesses. We also engaged with industry experts through both the consultation process and in additional evidence gathering activities to test these figures, with many advising that around 500 businesses currently operate as intermediaries within the UK. On the basis of all available evidence, we have taken a central estimate of around 500 businesses operating in the UK that are likely to be considered intermediaries.

This provides a central estimate of **around 500 intermediaries** operating in the UK.

5.4.3. UK businesses that advertise online

The guidance is likely to have an effect on almost all UK businesses as most are presumed to use online advertising to some degree. Considering the size and prominence of the UK online advertising market as noted in Section 2.2, and in the absence of further evidence, as a simplifying assumption it could be assumed in the absence of further evidence that the majority of UK businesses now advertise online, with online advertising accounting for 80% of all advertising spend in 2022 according to industry reports.⁶⁸

According to industry research around two thirds of UK SMEs having used some form of paid online advertising in the last year.⁶⁹ There are approximately 2,734,600 businesses currently considered 'live' in the UK,^{70,71} with the majority of these registered as SMEs (2,723,200) and the remainder (11,415) registered as large businesses. Applying the likely proportions of these businesses that advertise online noted above to these figures, gives an estimate of 1.8m 'live' businesses in the UK that are likely to advertise online.

This provides an estimate of **1.8m UK businesses that advertise online.**

Programme. Available at:

https://assets.publishing.service.gov.uk/media/6329a9abe90e07371b968cff/20220601_Online_Advertising_Programme_Impact_Assessment_PUB_v2.docx.pdf (accessed April 2026).

⁶⁸ Advertising Association (2022), *UK ad spend grew 8.8% in 2022 to reach £34.8bn*.

Available at: <https://adassoc.org.uk/our-work/uk-ad-spend-grew-8-8-in-2022-to-reach-34-8bn-inflationary-pressures-persist-with-minimal-growth-forecast-for-2023/> (accessed April 2026).

⁶⁹ IAB (2025), *Powering up report*. Available at:

https://www.iabuk.com/sites/default/files/public_files/IAB%20UK%20Powering%20Up%20Report%202025_0.pdf (accessed April 2026).

⁷⁰ *Live businesses are those that were paying Value Added Tax (VAT) and/or Pay As You Earn (PAYE) as of March 2026.*

⁷¹ ONS (2025), *UK Business Counts*. Available at:

<https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/bulletins/ukbusinessactivitysizeandlocation/2025> (accessed April 2026).

5.4.4. UK population users: who interact with online services that use storage and access technologies.

Given that online service providers across a broad range of sectors are expected to engage with this guidance, it is anticipated that all UK internet users will be included within affected groups also. Recent figures from Ofcom suggest that around 95% of people in the UK aged 16+ have access to the internet at home (via any device, e.g. PC, mobile phone etc),⁷² accounting for around 54 million people in the UK.⁷³ As highlighted in the previous sections, the most visited online services in the UK have current audience reach figures of around 95%,⁷⁴ and so we can apply this proportion to the estimated number of internet users.

Online service users that engage with online service providers are estimated to include up to **51 million people in the UK.**

5.4.5. Wider society

The guidance also has the potential to impact on other groups and may have indirect impacts on wider society. This might include

- civil society groups;
- organisations not already included in previous estimates; and
- the wider population not already included in previous estimates.

It is difficult to estimate who the guidance would and wouldn't affect indirectly. As such, all those within the UK population (69 million people) could be included as an upper end approximation of the number of people that could be affected by societal impacts. However the majority of these will already have been accounted for in the estimate above of 51m online service users that engage with online service providers, so we estimate the wider society affected group as the difference between these two figures.

Wider society includes the remaining UK population of **19 million people.**⁷⁵

⁷² Ofcom (2025), *Online Nation 2025 Report*. Available at: <https://www.ofcom.org.uk/media-use-and-attitudes/online-habits/online-nation> (accessed April 2026).

⁷³ ONS (2025), *Estimates of the population for the UK*. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland> (accessed April 2026).

⁷⁴ Ipsos iris (2025), *November reporting*. Available at: <https://ui2.dotmetrics.net/report/ranking?stepIndex=4> (accessed December 2025).

⁷⁵ May not sum to total due to rounding.

5.4.6. ICO

The ICO is the data protection regulator with regulatory responsibility for PECR as well as the UK GDPR, and the Data Protection Act 2018 (DPA).

This group is **wholly represented by the ICO.**

6. Cost-benefit analysis

In this section we assess the potential costs and benefits of the guidance on the affected groups. This section incorporates evidence and feedback gathered via the consultation process. For a summary of the consultation and our response see Annex E.

6.1. Approach to identifying impacts

In identifying the potential impacts of the guidance, it is important to distinguish between:

- Additional impacts that can be attributed to the guidance – these are affected by how the ICO chooses to develop the guidance.
- Impacts that are not attributable to the guidance – these are impacts that simply arise from the existing legislative requirements that controllers are already expected to comply with.^{76,77}

For the purposes of the impact assessment, we are interested in impacts that are attributable to the guidance, rather than those that would have happened in the absence of regulatory intervention – a concept known as ‘additionality’. Additionality can take a number of forms and may include the realisation of impacts at an earlier stage or to a higher scale or standard than would have been the case without intervention. Impacts can also be direct or indirect:

- **Direct impacts:** these are ‘first round’ impacts that are generally immediate and unavoidable, with relatively few steps in the theory of change between the introduction of the measure and the impact taking place.
- **Indirect impacts:** these are ‘second round’ impacts that are often the result of changes in behaviour or reallocations of resources following the immediate impact of the introduction of the measure. These impacts tend to be at the latter stages of a theory of change.

While it is not always feasible to categorise impacts distinctly, we have identified those that are attributable to guidance as far as possible. Our impact assessment draws on a mixture of quantitative and qualitative evidence where available, including responses received to the public consultation. However, as

⁷⁶ The impacts related to legislative requirements are already subject to impact assessments by the sponsoring government department. This includes the recent impact assessment which accompanied the DUAA, which we have reviewed this impact assessment and incorporated in our thinking throughout this report where relevant.

⁷⁷ DSIT (2025), *Data (Use and Access) Act: enactment impact assessment*. Available at: https://assets.publishing.service.gov.uk/media/690dd03447ad122f854627a8/data_use_and_access_act_enactment_impact_assessment.pdf (accessed April 2026).

discussed in more detail within Section 2, our analysis is limited by the lack of robust and specific evidence available.

6.1.1. Counterfactual

The counterfactual is a term used to describe the baseline activity that provides our point of comparison relative to the proposed intervention. The standard counterfactual in cost-benefit analysis is business as usual (BAU) is the outcome that is expected if current arrangements continue and the proposed intervention under consideration is not implemented⁷⁸. As outlined in Section 2, the 'guidance on the use of cookies and similar technologies' was in place since 2019 and provided an overview of the key considerations for organisations in ensuring compliance with regulation 6 PECR and UK GDPR (where the use of these technologies involves the processing of personal data) legislation.

If the updated guidance on the use of storage and access technologies was not introduced, then the 'guidance on the use of cookies and similar technologies' would continue to apply and would form the counterfactual in this case.

6.1.2. Monetising impact

Providing a quantification of the impacts of the guidance is challenging, given its wide-ranging scope and the limited evidence available to provide a monetised illustration on potential impacts on affected groups. Our analysis therefore focuses primarily on non-monetised impacts. However, where possible, we have provided high level quantitative analysis to indicate scale.

6.1.3. Uncertainty, risk and optimism bias

As set out in the Green Book,⁷⁹ it is necessary to consider the significant levels of uncertainty surrounding the evidential assumptions used to estimate the potential impacts of this guidance on the use of storage and access technologies. Although optimism bias is typically only considered in capital projects, we understand that there can be a tendency to overestimate aspects within non-capital project also, such as in the measurement of engagement with guidance.

To account for and demonstrate the implications of any potential bias, we have provided sensitivity analysis for the impacts we have been able to quantify.⁸⁰

⁷⁸ BAU does not mean doing nothing and it reflects the fact that continuing with current arrangements carries its own costs, benefits and risks.

⁷⁹ HM Treasury (2026), *The Green Book*. Available at: <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government> (accessed April 2026).

⁸⁰ See para 5.59 of HM Treasury's Green Book for more information on sensitivity analysis. HM Treasury (2026) *The Green Book*. Available at: <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government> (accessed April 2026).

This tests the sensitivity of impact estimates to changes in assumptions and is provided in Section 6.3.3.

6.2. Benefits

Affected groups: Online service providers; intermediaries; UK businesses that advertise; UK population users and wider society.

A number of benefits are expected from the implementation of updated guidance. While the assessment of the benefits that follows is mainly qualitative, we will continue to seek more information throughout monitoring and review processes discussed in Section 7.

The updated guidance is anticipated to **improve clarity and reduce regulatory uncertainty** across all affected groups, particularly online service providers and intermediaries. The updated guidance provides clarity on the range of SATs in scope of the guidance, changes to PECR following the DUAA, and wider updates to case law and ICO positions on key topics.

The use of the ICO's 'must', 'should' and 'could' approach helps to further improve this clarity, while simplification and minor changes throughout the guidance post consultation have also led to an increase in the Fleisch Reading Ease (FRE) test score; from 36.5 at draft stage to 45.7 at final (the higher the score, the more readable the text is).⁸¹ This indicates an improvement in overall guidance clarity and simplicity from draft to final stage.

Improved clarity will enable online service providers and intermediaries to **allocate resources more efficiently** and embed compliant practices more effectively, supporting longer-term operational stability. One respondent noted that clearer expectations help them to interpret obligations consistently:

'Members raise that the guidance should reduce compliance burdens by clarifying the rules and reducing the need for repeated consent requests for low-risk functions, which leads to compliance fatigue and users making less active choice as a result.'

Source: Consultation respondent.

⁸¹ BEIS (2017), *Business Impact Target: Appraisal of guidance: assessments for regulator-issued guidance*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/609201/business-impact-target-guidance-appraisal.pdf (accessed April 2026).

The embedding of compliant practices due to increased clarity is anticipated to reduce the risk of future intervention or penalties and **lowering potential long-term compliance costs**.

Online service providers and intermediaries may also experience cost reductions over time, as the improved clarity and reduced uncertainty around compliance will reduce the need for external advice (including legal advice), which according to the impact assessment accompanying the DUAA could be estimated at £1,278/year (equivalent to 4 hours of legal professional advice and 2 hours of clerical worker support).⁸²

Where online services providers embed new compliant practices, they may also see reputational benefits, with **greater public trust and confidence in their handling of personal data**. Increased trust may in turn support improved engagement with users. Clearer, more consistently compliant practices may enhance users' ability to exercise their data protection rights, through provision of **clearer and more meaningful control**.

'Of benefit will be increased clarity both to advise our customers on how to configure their consent management solutions in the UK (bearing in mind many have a global web footprint), and to inform the way that we develop our own product to better serve customers and data subjects.'

Source: Consultation respondent.

Users of compliant online services are also likely to be at a **lower risk of experiencing potential harms** outlined in Section 3.1. While wider society may benefit from a lower risk of the potential broader impacts of non-compliance outlined in Section 3.2, such as insufficient security measures which can increase the likelihood of data protection breaches and impose wider societal costs.

6.3. Costs

Affected groups: Online service providers; intermediaries; UK businesses that advertise online; and UK population users.

The updates to the guidance are likely to result in a range of direct and indirect costs. The ICO's guidance update does not itself create new legal obligations; it

⁸² This estimate relates to general external legal advice in order to maintain compliance with regulations amended through DUAA, rather than advice sought specifically in relation to regulation 6 PECR requirements. For further detail see: DSIT (2025), *Data (Use and Access) Act: enactment impact assessment*. Available at: https://assets.publishing.service.gov.uk/media/690dd03447ad122f854627a8/data_use_and_access_act_enactment_impact_assessment.pdf (accessed April 2026).

clarifies how to comply with existing law. Consequently, we do not identify any additional administrative costs caused by the guidance update.⁸³ This treatment aligns with recent cross-government practice to distinguish administrative burdens (information obligations) from wider compliance costs, and with HM Treasury's current methodology for reporting administrative burdens at the aggregate level.⁸⁴

Familiarisation costs represent one-off expenses incurred by organisations to understand and apply the updated guidance.⁸⁵ While respondents to our consultations agreed that there would be some costs associated with familiarisation,⁸⁶ feedback also suggested that the estimates provided in our draft impact assessment could be too low as the **topic is complex and businesses may need to revisit the guidance** numerous times.

'Each time guidance changes, there is work required to read and communicate these changes to our teams internally. Where a topic is complex businesses may need to revisit the guidance numerous times.'

Source: Consultation respondent.

While we acknowledge this feedback, we don't yet have evidence on the likely number of times an individual may read the guidance or the likely number of individuals within an organisation that may engage with guidance. However, we will seek to address this evidence gap within future research and stakeholder consultation. Based on estimates (see Annex D), we note that familiarisation costs are expected to be £176 for each read of guidance by one DPO level member of staff within an organisation.^{87, 88} In the absence of evidence, an

⁸³ Under the UK Standard Cost Model, administrative costs are the costs to businesses of meeting information obligations arising from regulation (e.g., collecting, processing, storing and providing information to a public authority or to third parties when required by law). This category is narrow and excludes policy/compliance costs such as process redesign, training, system changes or capital outlays. See: Cabinet Office (2005) *Measuring Administrative Costs: UK Standard Cost Model*. Available at: <https://regulatoryreform.com/wp-content/uploads/2015/02/UK-Standard-Cost-Model-handbook.pdf> (Accessed Feb 2026).

⁸⁴ HMT (2025) *Technical Annex – 25% Target Methodology (Annex A)*. Available at: https://regulation.org.uk/library/2025-HMT-admin_costs.pdf (accessed April 2026)

⁸⁵ Familiarisation costs are the costs associated with reading and becoming familiar with new or revised guidance. We calculate these as costs associated with an individual at manager, director or senior official level reading the document. See Annex C for further detail on our approach.

⁸⁶ The draft impact assessment estimated familiarisation costs at £124 per organisation based on a wordcount of 17,879 and a readability score of 36.5.

⁸⁷ The final impact assessment estimates familiarisation costs at £176 per read of guidance based on a wordcount of 22,564 and a readability score of 45.7.

⁸⁸ While the familiarisation cost figure is higher than that set out within the draft impact assessment, this is primarily due to the higher wordcount and the difference between the 2024 and 2025 median hourly earnings rate.

indicative estimate of three reads of the guidance by one DPO level member of staff within an organisation would equate to a familiarisation cost of £528. These costs apply across the population of online service providers, intermediaries and other organisations affected by the changes.

Where online service providers and intermediaries currently use storage and access technologies, some may also face **implementation (an ongoing maintenance) costs associated with any changes to practices/processes required to ensure compliance**. These costs could include the need to update user interfaces, reconfigure backend systems, or alter existing workflows. We acknowledge that these costs are likely to differ across businesses, with one consultation respondent stating that for them 'the practical compliance requirements would remain largely unchanged for advertising activities'.

'...If certain features are missing, these platforms may also face implementation costs to develop and integrate the necessary functionalities.'

Source: Consultation respondent.

Feedback to consultations noted that for some online service providers, introducing a 'reject all' option could negatively affect advertising performance, resulting in some shifting to alternative advertising methods with similar costs but reduced returns. In cases where advertising-funded models become less sustainable, some online service providers may **pivot to alternative revenue raising models**, such as consent or pay models. One response highlighted additional costs, such as higher bounce rates for services using consent or pay models, as well as the potential for **increased costs to be passed on to consumers** if these models become more common:

Additional indirect costs are also noted that may result from any updated practices that limit the amount of personal data available for targeting or where users exercise greater choice (e.g. higher 'reject all' rates). However, according to consultation responses these second-round indirect costs appear to be relatively minor:

- A small number of online service providers and intermediaries may see a reduction in revenue from the cessation of previously non-compliant practices and a potential narrowing of service offerings where profitability decreases.
- Businesses that generate income through online advertising; or use/rely heavily on online advertising markets may notice reductions in market potential over time which could impact their long-run profitability.
- Reduced service offerings could also impact the users who interact with online services and may further impact the profitability of businesses that use/rely on online advertising markets.

6.3.1. Summary

Table 2 gives an overview of the impacts on affected groups and provides estimates of the scale of each of the affected groups.

Table 2: Summary of potential impacts of guidance on the use of storage and access technologies

Affected groups	Benefits	Costs
<p>Online service providers: that use storage and access technologies.</p> <p>Scale: 43,000 online service providers</p>	<ul style="list-style-type: none"> • Improved understanding of relevant legislation. • Reduction in costs of obtaining advice and support (eg legal advice of approximately £1,278 per year). • Reduction in potential future compliance costs of relevant legislation (eg avoidance of future intervention including penalties). • Improved reputation through increased public confidence in compliance with relevant legislation. 	<ul style="list-style-type: none"> • Familiarisation costs of engagement with the updated guidance (£176 per single read of guidance).⁸⁹ • Potential costs (implementation and maintenance) of any changes to employ compliant practices/processes where necessary. • Potential reduction in revenue from cessation of non-compliant practices. • Potential reduction in how organisations view the effectiveness of insights and consumer targeting, due to a reduction in the amount of personal data available (for instance due to consumers selecting 'reject' or 'reject all'). • Potential reduction in revenue for organisations that generate income through personalised advertising.

⁸⁹ Familiarisation costs are the costs associated with reading and becoming familiar with new or revised guidance. We calculate these as costs associated with an individual at manager, director or senior official level reading the document. See Annex C for further detail on our approach.

<p>Intermediaries: businesses within the supply chain of online service providers</p> <p>Scale: 500 intermediaries</p>	<ul style="list-style-type: none"> • Improved understanding of relevant legislation. • Reduction in compliance costs of relevant legislation (eg avoidance of future intervention including penalties). • Improved reputation through increased public confidence in compliance with relevant legislation. 	<ul style="list-style-type: none"> • Online service providers may pivot to other models of revenue raising, for instance consent or pay models. • Familiarisation costs of engagement with the updated guidance (£176 per single read of guidance and £528 per three reads). • Potential implementation costs of employing compliant practices where necessary. • Potential perceived reduction in effectiveness of insights and consumer targeting for third parties, due to a reduction in acceptance rates of storage and access technologies for online advertising purposes. • Potential reduction in revenue due to reduction in the ability to sell or promote services to organisations. • Potential reduction in market size and potential due to impacts on organisations that generate income through online advertising; or use/rely heavily on online advertising markets.
<p>UK businesses that advertise online.</p> <p>Scale: 1.8m UK businesses</p>	<ul style="list-style-type: none"> • Improved understanding of relevant legislation. • Improved reputation through increased public confidence in compliance with relevant legislation. 	<ul style="list-style-type: none"> • Potential time costs Potential reduction in how organisations view the effectiveness of insights and consumer targeting, due to a reduction in the amount of personal data available (due to consumers for instance selecting 'reject' or 'reject all').

		<ul style="list-style-type: none"> • Potential reduction in revenue potential from buying advertising space due to lower return from targeted audience interaction rates. • Potential for increased marketing spend by organisations reliant on online advertising (particularly SMEs) of engaging with and understanding updated guidance.
<p>UK population users: People who interact with online services that use storage and access technologies.</p> <p>Scale: 51 million people</p>	<ul style="list-style-type: none"> • Access to better and more compliant online services. • Improved confidence and control around ability to exercise data protection rights from access to more compliant online services. • Reduction in potential data protection harms. 	<ul style="list-style-type: none"> • Potential for increased friction due to potential changes in consent management practices by organisations. • Potential reduction in service offerings due to reduced profitability of organisations that use/rely on online advertising markets.
<p>Wider society.</p> <p>Scale: 19 million people</p>	<ul style="list-style-type: none"> • Reduction in societal costs of data protection harms associated with organisational non-compliance. 	<ul style="list-style-type: none"> • Potentially reduced wider organisational service offerings or the removal of a service altogether.
<p>ICO.</p>	<ul style="list-style-type: none"> • Improved engagement with organisations. • Ability to allocate resources efficiently. 	<ul style="list-style-type: none"> • Upfront resource costs.

Source: ICO analysis.

6.3.2. Distributional impacts

No significant distributional impacts have been identified through our work. However, we note that the guidance may benefit those with protected characteristics through the reduced potential for data protection harms.⁹⁰ Where organisations need to make system changes in order to comply, the associated costs may fall disproportionately on SMEs. However, the compliant use of these technologies remains a statutory requirement for all organisations.

6.3.3. Key assumptions

The impacts identified from the guidance are contingent on the following assumptions:

- awareness of the guidance;
- the extent of engagement with the guidance; and
- changes that are made to business practices as a result of engaging with the guidance.

While we are unable to quantify the likelihood of a change in these assumptions, Table 3 provides an indication of the sensitivity of key impacts to any potential change.

Table 3: Sensitivity of key impacts to assumptions

Impacts	Sensitivity
Improved understanding of relevant legislation.	High
Improved compliance with relevant legislation.	Medium
Familiarisation costs.	High
Potential cost of changes to practices/processes.	Medium
Increased public trust and confidence.	High
Reduction in harms to UK data subjects.	Medium

Source: ICO analysis.

6.3.4. Overall Assessment

As summarised in Table 4, our analysis has identified a number of impacts of the guidance including the reduced potential for data protection harms. The guidance is expected to increase regulatory certainty for online service

⁹⁰ Refers to characteristics protected by the Equality Act 2010 (England, Scotland and Wales) and Section 75 of the Northern Ireland Act 1998. These include age, disability, sex, sexual orientation, gender reassignment, marriage or civil partnership (in employment only), pregnancy and maternity, race, religion or belief and political belief.

providers, their supply chain, and wider UK businesses that use online advertising.

Although there will be costs to businesses from reading, understanding and implementing the guidance, this is expected to be outweighed by increased confidence and control among users and the wider societal benefits of reduced data protection harms. On balance we expect the guidance to have a **net positive impact**. Table 4 presents a summary of the main impacts we expect to see from the guidance.

Table 4: Overall impacts of guidance on the use of storage and access technologies

Impacts	Attribution to the ICO	Direct or Indirect	Assessment
Benefits			
Improved understanding of relevant legislation.	Fully attributable	Direct	Moderate/major positive
Improved compliance with relevant legislation.	Fully attributable	Direct	Moderate/major positive
Increased public trust and confidence.	Partly Attributable	Direct	Moderate/major positive
Reduction in harms to UK data subjects.	Partly Attributable	Direct	Moderate/major positive
Costs			
Familiarisation costs of engaging with guidance.	Fully attributable	Direct	Minor/moderate negative
Potential cost of changes to practices/processes.	Partly Attributable	Direct	Minor/moderate negative
Overall impact: moderate positive			

Source: ICO analysis.

7. Monitoring and review

In line with the standards set out in our Ex-Post Impact Framework,⁹¹ we will look to put in place an appropriate and proportionate review structure. This will follow best practice and align with our organisational reporting and measurement against ICO objectives. For example, this could include:

- feedback from online service providers and other affected groups on the updated guidance on the use of storage and access technologies;
- internal monitoring of complaints related to the use of SATs;
- engagement figures with the guidance; and
- review of performance and regular reporting, to understand whether the updated guidance is enabling any improvements.

This intervention also forms part of the ICO's Online Tracking Strategy, which sets out wider objectives for promoting compliance with the law to obtain a fairer online tracking ecosystem for people and businesses. As such, monitoring of this guidance will directly feed into the ex-post impact measurement of the Strategy, helping the ICO understand how regulatory guidance contributes to the strategy's broader aims.

⁹¹ ICO (2024) *Ex-post Impact Framework*. Available at: https://ico.org.uk/media2/migrated/4031030/ex-post-impact-framework_sept24_v1.pdf (accessed April 2026).

Annex A: Updates to guidance

A series of updates have been made to the 2019 'guidance on cookies and similar technologies' in line with regulation 6 PECR⁹² and UK GDPR⁹³ (where the use of these technologies involves the processing of personal data), as well as the DUAA.⁹⁴

A series of updates have been carried out on the 2019 'guidance on cookies and similar technologies', including:

- Updates in December 2024, including:
 - updates throughout to clarify and reference the range of storage and access technologies that are widespread today alongside cookies, using examples throughout;
 - use of "must", "should", or "could" language to provide regulatory clarity to readers; and
 - reflection of recent case law and ICO positions on key topics, including on our expectations for online advertising.
- Updates in July 2025 on the basis of the DUAA, including:
 - updates to reflect changes to PECR following the DUAA;
 - additional chapter: "what are the exceptions?" to explain the exceptions to the prohibition on storing or accessing information on people's devices; and
 - minor changes throughout the guidance to reflect the updated rules.
- Updates in April 2026 to reflect requests in consultations on previous updates, including:
 - additional sections: "what does a 'simple means of objecting' mean?" and "can we use the same storage and access technology for multiple purposes?"; and
 - minor changes to the content where we have sought to provide further clarity where requested in the consultation.

⁹² UK Government (2003), *The Privacy and Electronic Communications (EC Directive) Regulations 2003*. Available at: <https://www.legislation.gov.uk/ukxi/2003/2426> (accessed April 2026).

⁹³ UK Government (2016), *Regulation (EU) 2016/679 of the European Parliament and of the Council*. Available at: <https://www.legislation.gov.uk/eur/2016/679/contents> (accessed April 2026).

⁹⁴ UK Government (2025), *Data (Use and Access) Act*. Available at: <https://www.legislation.gov.uk/ukpga/2025/18/contents> (accessed April 2026).

Annex B: Overview of storage and access technologies

This annex provides an overview of some of the key storage and access technologies.

Table 5: What are storage and access technologies?

Technology	Description
Cookies	<p>Cookies are small text files generated by a web server responding to a request from a website. The user's device can store cookies (for example, via their web browser) and send the information back when they next make a request to the same web server.</p> <p>Cookies are widely used to make websites work, or work more efficiently, and to provide information to the website operator. For example, they can be used for:</p> <ul style="list-style-type: none"> • recognising a user's device; • remembering what's in a shopping basket when shopping for goods online; • supporting users to log in to a website or remembering they are logged in; or • analysing traffic to a website and how users interact with the website. <p>They can also be used for other purposes, such as tracking users' browsing behaviour.</p>
Tracking pixels	<p>Tracking pixels are small pieces of code, usually an image file, embedded into a piece of content like a website or an email. Their purpose is to create a communication between the user's client and a server. The server can then identify information, such as when a user has viewed a webpage or opened an email.</p>
Link decoration and Navigational tracking	<p>Link decoration refers to the practice of adding extra information to the URL in a link that someone clicks on. This doesn't change the destination of the link but provides a way to pass additional information to the destination site beyond what is essential to navigate to the page that the user wants to visit.</p> <p>This extra information is generated:</p> <ul style="list-style-type: none"> • statically, eg by being attached to a URL when a link is created; or

- dynamically, eg through the use of JavaScript code.

When a user navigates to the webpage via the URL, the browser loads the requested resource. It may also involve storage or access of other information.

Scripts and Tags	Online services can add pieces of JavaScript code, often referred to as 'scripts' or 'tags', to web pages to collect additional information about visitors to their service. When a user accesses a web page, their browser interprets the instructions included in the script and executes them. While scripts can be used for many purposes, 'tags' often refers to a JavaScript 'snippet' included specifically to gather data about a website's visitors.
Device fingerprinting	Device fingerprinting, such as browser fingerprinting techniques, involves the collection of pieces of information about a device's software or hardware. These can be combined to uniquely identify a particular device.
Web storage	Web storage is another way in which online services can store information, or access information stored, on someone's device. It involves websites storing data in someone's browser. It's also known as "local storage", "HTML5 storage" or "DOM storage".

Source: ICO analysis.

Annex C: Measurement of affected groups

This annex sets out the calculations made to estimate and quantify groups that have the potential to be affected by the guidance.

Table 6: Measurement of UK organisations within affected groups

Assumption	Detail
Number of UK businesses ⁹⁵	5,690,265
Number of businesses currently considered 'live' ^{96,97}	2,734,615
Information Society Service (ISS) providers ⁹⁸	14%-21% (22,500–65,000)
Businesses that acquire personal data through the use of cookies placed on people's connected devices ⁹⁹	9.2% (2,508)
Link decoration ¹⁰⁰	73.0% (31,910)
Web Storage ¹⁰¹	54.1% (23,642)
Scripts ¹⁰²	27.8% (12,127)
Tracking pixels ¹⁰²	17.3% (7,560)
Device fingerprinting ¹⁰³	10.2% (4,449)
Tags ¹⁰²	4.1% (1,779)

⁹⁵ Department for Business and Trade (2025) *Business Population Estimates*. Available at: <https://www.gov.uk/government/statistics/business-population-estimates-2025> (accessed April 2026).

⁹⁶ *Live businesses are those that were paying Value Added Tax (VAT) and/or Pay As You Earn (PAYE) as of March 2026.*

⁹⁷ ONS (2025), *UK Business Counts*. Available at: <https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/bulletins/ukbusinessactivitysizeandlocation/2025> (accessed April 2026).

⁹⁸ ICO (2026), *Information Society Services (ISS) research*. Available at: <https://ico.org.uk/about-the-ico/research-reports-impact-and-evaluation/research-and-reports/information-society-services-iss-research/> (accessed April 2026).

⁹⁹ DSIT (2024), *UK Business Data Survey*. Available at: <https://www.gov.uk/government/statistics/uk-business-data-survey-2024/uk-business-data-survey-2024> (accessed April 2026).

¹⁰⁰ Munir, Lee, Iqbal and Shafiq (2023) *PURL: Safe and Effective Sanitization of Link Decoration*. Available at: https://www.researchgate.net/publication/372961970_PURL_Safe_and_Effective_Sanitization_of_Link_Decoration (accessed April 2026).

¹⁰¹ Ahmad, Casarin and Calzavara (2023). *An Empirical Analysis of Web Storage and Its Applications to Web Tracking*. Available at: <https://dl.acm.org/doi/10.1145/3623382#sec-4-3> (accessed April 2026).

¹⁰² Built with data (2024) *Analytics Usage Distribution in United Kingdom*. Available at: <https://trends.builtwith.com/analytics/country/United-Kingdom> (accessed April 2026).

¹⁰³ Iqbal, Englehart and Shafiq (2021) '*Fingerprinting the Fingerprinters: Learning to Detect Browser Fingerprinting Behaviors*'. Available at: <https://arxiv.org/abs/2008.04480> (accessed April 2026).

Annex D: Familiarisation costs

This annex sets out the approach taken to estimate familiarisation costs for the guidance. We have estimated the total time for reading the guidance at 3 hours and 58 minutes. This is based on a word count of around 22,564 words and a Fleisch reading ease score of 45.7.

Table 7: Estimate of the average time taken to read the guidance

Document	Word Count	Fleisch reading ease score	Assumed words per minute	Estimated reading time (hr:mn)
Guidance	22,564	45.7	75	5h

Source: ICO, BEIS (2019).¹⁰⁴

The impact of familiarisation on organisations can be monetised using data on wages from the ONS Annual Survey of Hours and Earnings.¹⁰⁵

Making the conservative assumption that the relevant occupational group is 'Managers, Directors and Senior Officials', the 2025 median hourly earnings (excluding overtime) for this group is £29. This hourly cost is uprated for non-wage costs using the latest figures from the Regulatory Policy Committee guidance,¹⁰⁶ resulting in an uplift of 22% and an hourly cost of £35. We therefore assume the cost of reading the guidance once to be approximately £175.87.

It is important to acknowledge that the number of individuals required to read and familiarise themselves with the guidance will vary across organisations, depending on their size, structure and governance arrangements. For the purposes of this impact assessment, we therefore illustrate the costs associated with both a single-read (£175.87) and three reads (£527.62) to present a pragmatic estimate of familiarisation cost per organisation.

- This approach provides a transparent and proportionate baseline that can be readily scaled to reflect organisational needs where multiple teams or functions are required to engage with the guidance.
- More granular modelling of familiarisation costs by firm size or organisational structure was not considered proportionate given the

¹⁰⁴ BEIS (2017), *Business Impact Target: Appraisal of guidance: assessments for regulator-issued guidance*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/609201/business-impact-target-guidance-appraisal.pdf (accessed April 2026).

¹⁰⁵ ONS (2025), *Annual Survey of Hours and Earnings*. Available at: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurveyofhoursandearnings/2025> (accessed April 2026).

¹⁰⁶ RPC (2019), *RPC guidance note on 'implementation costs'*. Available at: <https://www.gov.uk/government/publications/rpc-short-guidance-note-implementation-costs-august-2019> (accessed April 2026).

limited available evidence on internal dissemination practices and the risk of introducing spurious precision.

Stakeholder feedback and experience from consultations indicate that this assumption is likely to understate real-world familiarisation costs for larger organisations, where guidance is typically reviewed and disseminated across several teams, and the estimates should be interpreted accordingly.

Annex E: Summary of consultation responses

In December 2024, the ICO launched a consultation on its draft SATs guidance and accompanying draft Impact Assessment (IA). The consultation was open for 12 weeks, receiving 40 valid responses (23 received through the online survey tool and 17 email responses).

Following the passage of the Data (Use and Access) Act (DUAA), a second consultation focussed on a new chapter in the guidance titled 'What are the exceptions?', which addressed the addition of new exceptions to Regulation 6 of the Privacy and Electronic Communications Regulations (PECR) under DUAA. This consultation ran for a further 12 weeks from July to September 2025, receiving 30 valid responses (18 through the online survey tool and 12 email responses).

Technical points to note on the responses:

- In line with the wider policy summary of responses to the consultation,¹⁰⁷ six survey responses were excluded in the data cleaning process.¹⁰⁸
- Some respondents did not respond via the online platform and instead provided email responses that did not follow the consultation formats, so it was not possible to include these in the quantitative analysis. However, qualitative insights provided have been included in analysis where appropriate.

Breakdown of responses

An overview of respondents is provided in Table 8.

- Of the 23 valid responses received in the first round of consultation, 20 were on behalf of organisations, while the remaining three were from individuals; one from an individual acting in a private capacity, one from an individual acting in a professional capacity and one from an academic.
- Of the 18 valid responses received in the second-round of consultation, the majority (14 responses) were from organisations, two were from individuals acting in a private capacity, one was from an academic, and one was from a charity or third sector organisation.

¹⁰⁷ ICO (2026), *Consultation on the updates to our storage and access technologies guidance*. Available at: <https://ico.org.uk/about-the-ico/responses-to-ico-consultations/updates-to-our-storage-and-access-technologies-guidance/> (accessed April 2026).

¹⁰⁸ This was because they did not provide substantive answers to the consultation questions.

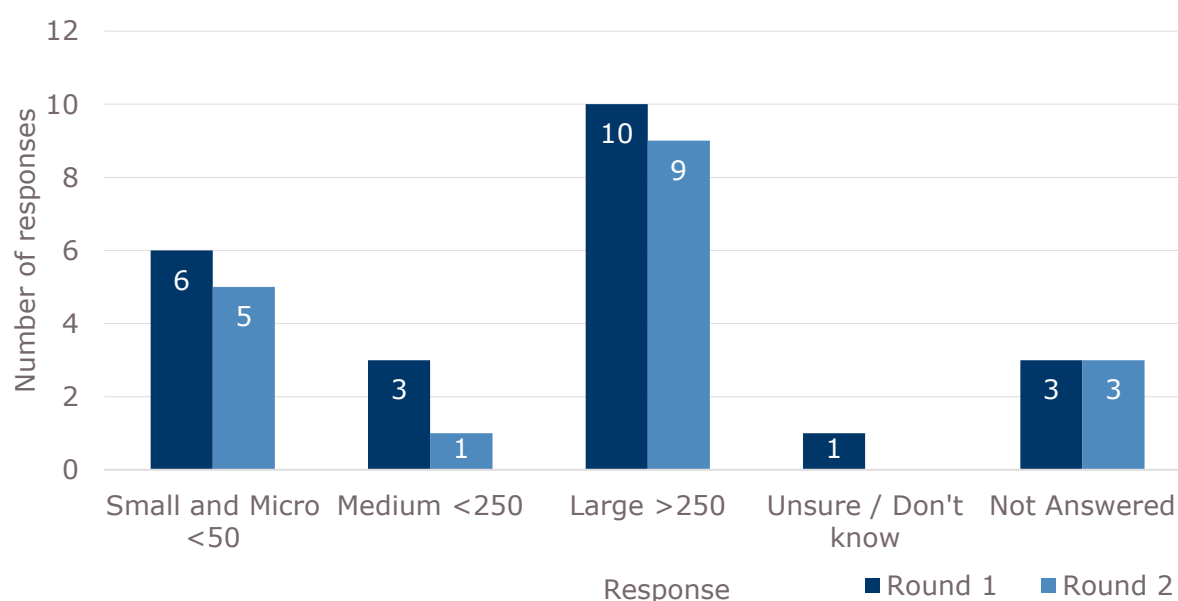
Table 8: Breakdown of respondents

Respondents	First-round	Second-round	Total
An organisation	20	14	34
An individual acting in a professional capacity	1	2	3
An individual acting in a private capacity	1		1
An academic	1	1	2
A charity or third sector organisation		1	1
Total	23	18	41

Source: ICO analysis, 41 respondents.

The organisations who responded to both the first and second round of consultations have been classified into small, medium and large organisations, based on the number of staff they employ. As shown in Figure 4, the organisations that responded were most commonly large organisations employing over 250 staff.

Figure 4: Size of organisations



Source: ICO analysis, 41 respondents.

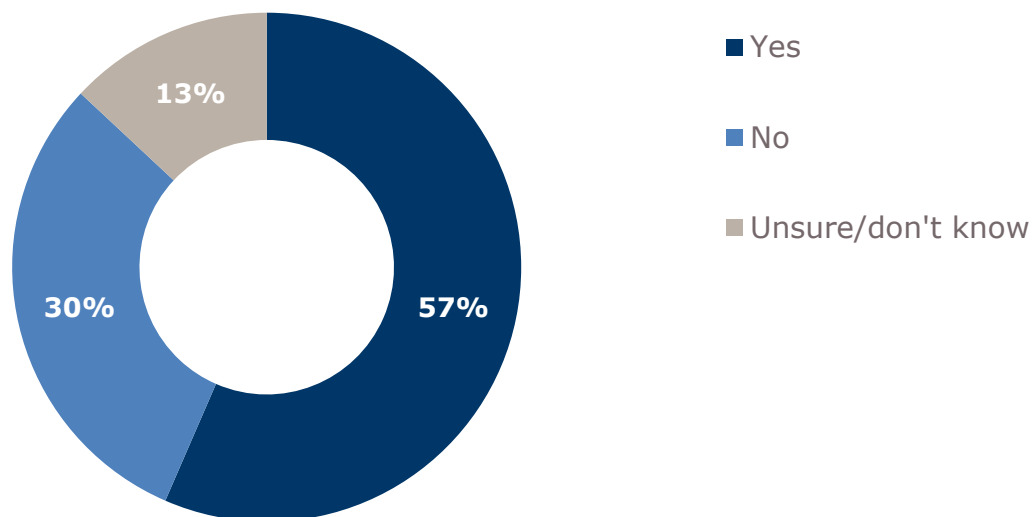
Consultation responses

Affected groups

Over half of respondents to the first-round consultation (13 responses / 57%) agreed that the draft impact assessment adequately covered the main affected

groups.¹⁰⁹ However, almost a third (7 responses / 30%) felt that this was not adequately covered as illustrated in Figure 5.

Figure 5: Adequately covers the main affected groups



Source: ICO analysis. 23 respondents.

The following examples were provided of affected groups not adequately covered:

- Users and providers of privacy-focused website analytics.
- People searching for housing (due to difficulties detecting and measuring discriminatory housing advertising placements).
- Users who recognise that they have a gambling problem and choose not to be targeted for gambling-related advertising.
- Small and medium size publishers.
- Consent management platforms.

Anticipated impacts of updated guidance on storage and access technologies

Respondents to the first-round consultation were also asked if they thought the draft impact assessment adequately outlined the main impacts.¹¹⁰ Of the 23 valid responses received:

- Ten respondents (43%) agreed that the draft impact assessment adequately outlined the main impacts.
- Seven respondents (30%) disagreed and three respondents (13%) strongly disagreed.

¹⁰⁹ This question was not asked in the second-round consultation, as due to proportionality there was no draft impact assessment directly linked.

¹¹⁰ This question was not asked in the second-round consultation, as due to proportionality there was no draft impact assessment directly linked.

- Three respondents (13%) said they were unsure or didn't know.
- One respondent who disagreed, provided further explanation of potential additional costs, which will be discussed in the following section.

Many of the comments on impacts related to the wider context of online advertising. Some respondents expressed concerns that the risks to consumers from online advertising may be overstated, with some suggesting that consumers often prefer targeted ads.

Feedback also indicated that introducing a 'reject all' option could negatively affect advertising performance, resulting in some businesses shifting to alternative advertising methods with similar costs but reduced returns. One response highlighted additional costs, such as higher bounce rates for services using consent or pay models, as well as potential increased costs for consumers if these models become more common.

It was noted by some respondents that the updated legislation (and corresponding update to guidance) did not make exemptions around 'digital advertising-related activities' that could be considered 'essential', Feedback notes:

'... [this is a missed] opportunity to unlock growth for news publishers that adopt low privacy risk advertising, which does not process personal data or involve contextual advertising'.

Source: Consultation respondent.

Costs and Benefits

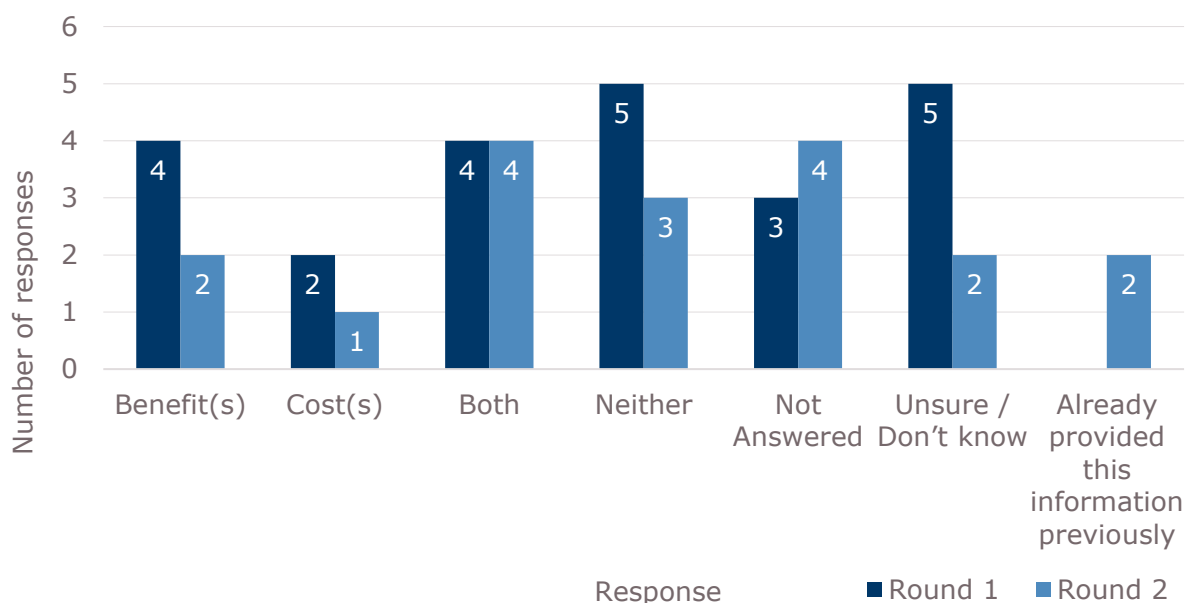
Respondents to both the first and second round consultation were asked whether they thought the updates to the draft guidance for storage and access technologies would result in additional costs or benefits.

In both consultations, we asked respondents whether they thought the updates to the draft storage and access technologies guidance would result in additional costs or benefits. Responses were as follows:

- Eight respondents (20%) expected both additional costs and benefits.
- Eight respondents (20%) expected neither costs nor benefits.
- Six respondents (15%) expected only benefits.
- Three respondents (7%) expected only costs.
- The remaining respondents either did not answer (seven respondents / 17%), were unsure (seven respondents / 17%), or had already provided this information in the first consultation (two respondents / 5%).

These responses are illustrated in Figure 6.

Figure 6: Benefits and costs of the updated guidance



Source: ICO analysis, 41 respondents.

Costs

Organisations who reported that the updated guidance would result in costs, identified the following:

- familiarisation costs;
- compliance costs;
- engineering and legal costs to design new systems;
- loss of productivity while guidance was in draft format due to potential for lack of clarity; and
- increased consumer friction.

Organisations who identified costs as a result of the guidance discussed the **costs associated with familiarisation**:¹¹¹

'While there would be some familiarisation costs to understand the new framework, the practical compliance requirements would remain largely unchanged for advertising activities.'

Source: Consultation respondent.

Feedback also suggested that the current estimated costs are too low as the topic is complex and **businesses may need to revisit the guidance** numerous times.

¹¹¹ The draft IA estimated familiarisation costs at £124.28 per organisation based on a wordcount of 17,879 words and a Fleisch reading ease score of 36.5. See Annex C for more information on calculation of familiarisation costs.

Two of the email respondents also reflected familiarisation and implementation costs like those noted above and explicitly discussed **updating internal guidance and training staff** across certain teams to apply the guidance consistently.

'There will likely be increased Staff Time required to assess and categorise cookies and update associated policies.'

Source: Consultation respondent.

One respondent provided quantitative information related to **compliance costs**:

'We estimate additional costs in the region of £150,000–£275,000 over the next 12–18 months, primarily driven by internal resource allocation (FTE focus) and compliance adoption.'

Source: Consultation respondent.

This respondent continued to explain that this cost was composed of:

- **Legal and governance review** of the updated exceptions framework.
- **Technical reconfiguration** of consent management platforms and tagging.
- **Staff training** across digital, data, engagement, marketing, operational and compliance teams.
- Documentation and **audit trail development** to evidence lawful reliance on exceptions.

One respondent also noted that some **organisations within the supply chain may also incur familiarisation and implementation costs**:

'These platforms are likely to incur familiarisation costs as they engage with the guidance, ensuring they understand the requirements and assess whether their services include all the features outlined by the ICO. Additionally, CMP providers may need to invest in updating consent interfaces and controls to align with the updated guidance, as well as in documenting these updates and enabling internal teams to engage with clients by providing clarity on available functionalities and potential implementation approaches. If certain features are missing, these platforms may also face implementation costs to develop and integrate the necessary functionalities.'

Source: Consultation respondent.

Respondents also noted that changes in the compliance landscape and implementation of new guidance **may lead to productivity drag** as stakeholders adjust to the new requirements.

Any change in the compliance landscape results in our small and medium [sized] publishers asking lots of questions and getting worried. This creates overhead and a productivity drag.'

Source: Consultation respondent.

'We expect the Draft Guidance will result in additional delays to client onboarding, or lost business, due to confusion amongst advertisers. This will therefore lead to loss of revenue and staff time.'

Source: Consultation respondent.

Benefits

Organisations who reported that the updated guidance would result in benefits, identified the following potential impacts:

- improved understanding of the relevant legislation;
- reduction in costs related to third party providers;
- provision of more transparent information to customers; and
- building trust and organisational reputation.

One respondent stated:

'Of benefit will be increased clarity both to advise our customers on how to configure their consent management solutions in the UK (bearing in mind many have a global web footprint), and to inform the way that we develop our own product to better serve customers and data subjects.'

Source: Consultation respondent.

The same respondent said that, whilst difficult to estimate, these benefits could result in a **10% reduction in time to implementation for clients, and a 20% reduction of time to market for new product features**. Another third sector respondent, also noted productivity benefits of the guidance for online service users:

'Members raise that the guidance should reduce compliance burdens by clarifying the rules and reducing the need for repeated consent requests for low-risk functions, which leads to compliance fatigue and users making less active choice as a result.'

Source: Consultation respondent.

Responses also discussed how changing to a first-party data foundation would initially come with a cost, but the anticipated **benefits far outweighed this cost**:

'A member has raised that they do not anticipate additional costs. For them, the primary requirement will be updating internal guidance and training, which is outweighed by the benefits of clarity and reduced friction.'

Source: Consultation respondent

Respondents also noted some indirect benefits such as the **improvement in alignment** between data protection and the regulatory duties of DUAA.

'...if the guidance is clarified and appropriately scoped, it could enable more proportionate, simplified and privacy-conscious use of data, particularly in digital channels where current PECR constraints can limit our ability to activate known customer insights.'

Source: Consultation respondent

The response further noted that clarified and appropriately scoped guidance could **enable more proportionate, simplified and privacy-conscious use of data**, which could result in more consistent customer experiences across online channels and improved accessibility and usability for vulnerable users.