W3C

Web Sustainability Guidelines

Checklist

2.1	Examine and disclose any external factors interacting with your project				
	Success Criterion				
☐	Anticipate and identify existing or potential negative external factors. Disclose these in a publicly available resource, identifying areas where digital sustainability can be improved. Perform this audit at the start of your project and at regular intervals.				
☐	Establish a plan of action for affected parties who might be indirectly impacted by choices made with your project. Examples include neighbors accepting parcels or traffic jams due to deliveries. Other examples include the local health impacts of infrastructure emissions, or supply chain pressure.				
	GRI	Medium	Medium	Medium	Medium
2.2	Understand user requirements or constraints, resolving barriers to access				
	Success Criterion				
☐	Identify primary and secondary target users. Evaluate and define their needs through research, testing, or analytics. Ensure your users and affected communities are consistently and closely involved in the research and testing process.				
☐	Conduct internal and user research to identify whether a technical, material, or human constraint might require adaptations to reduce barriers or improve access to content.				
☐	Remove identified barriers to access, provided they do not introduce or increase security or safety risks or exposure. Removable pain points can include deceptive design patterns and accessibility hurdles, but not include user verification or authentication mechanisms.				
	GRI	Medium	Medium	Medium	Medium
2.3	Integrate sustainability into every stage of the ideation process				
	Success Criterion				
☐	Optimize all branding materials and assets approved during the ideation process in line with sustainability best practices prior to and on an ongoing basis after deployment. Where provided, brand guidelines must also detail the sustainability impact and best-practice deployment of materials and assets.				
☐	Use wireframes and rapid prototyping to quickly build consensus, reduce risk, and reduce the number of resources needed to build features.				
☐	Use the participatory design approach to involve users within the iteration and design process. When conducting user testing, reach out to your community to help improve your product. Provide opportunities for users to apply their knowledge and experience to your product or service.				
☐	Consider planetary needs and the environmental boundaries during the ideation phase. This can include creating non-user, non-human (animal, planet) personas, or climate-specific user stories and sprints.				
	GRI	Medium	Medium	Medium	Medium

2.4	Minimize non-essential content, interactivity, or journeys				
	Success Criterion				
☐	Make access as simple and efficient as possible. Displaying the time required to complete an action, reducing choice, and ensuring users understand requirements at the start of a journey can improve user efficiency.				
☐	Ensure user journeys are as smooth as possible. It also helps to build on established design patterns that people already understand.				
☐	Enable users to complete tasks without distractions or non-essential features getting in the way.				
☐	Only show users information that is relevant to their experience, hiding non-essential information from view and always in ways appropriate to the accessibility requirements of different users.				
☐	Ensure that disruptive actionable information, such as pop-up or modal windows, can only be initiated by the user.				
☐	Use decorative design only when it enhances user experience. Remove unnecessary assets or those that do not enhance user experience or sustainability. Alternatively, make these optional and disabled by default.				
	GRI	Medium	Medium	Medium	Medium
2.5	Ensure that navigation and wayfinding are well-structured				
	Success Criterion				
☐	Provide an accessible, easy-to-use navigation menu with search features to help users easily find what they need.				
☐	Consider implementing an efficient and regularly updated sitemap for human users. While guidance beyond the navigation bar may be unnecessary for smaller projects, clearly structured human-readable sitemaps can improve accessibility and help users find their way through websites or other online content with naturally complex or legacy information architecture.				
☐	Implement lightweight and efficient means for users to learn about new content and services.				
	GRI	Medium	Low	Medium	Low
2.6	Design to assist and not to distract				
	Success Criterion				
☐	Ensure users can easily control how and when they receive information, with respect for their attention, focus, and mental energy.				
☐	Prioritize features that assist rather than distract users, not unnecessarily prolonging the time they spend engaging with your content.				
☐	Avoid using design strategies intended to artificially prolong user attention, such as infinite scroll.				
	GRI	Medium	Medium	Medium	Medium
2.7	Avoid being manipulative or deceptive				
	Success Criterion				
☐	Avoid deceptive design or unethical coding techniques that manipulate users into taking actions that are not in their best interest. Examples include anti-right click, copy prevention, requiring an account to purchase, etc.				

☐	Select, present, and label advertisements and sponsorships transparently and only implement where these provide economic value in an ethical way without diminishing user experience.				
☐	Evaluate and remove unnecessary or unused analytics and tracking, especially any operating without user consent.				
☐	Focus on serving user intent through non-manipulative search and social media optimization. For example, do not misuse coding practices intended to support assistive technologies. This can include content with natural redundancy, or unhelpful or low-quality material designed only to manipulate search results.				
	GRI	Low	Low	Low	Low
2.8	Make deliverables understandable and reusable				
	Success Criterion				
☐	Create deliverables, including documentation, in ways that facilitate later reuse.				
☐	Document functionality and technical specifications by creating easy to understand resources.				
☐	Developers have access to code comments and have the ability to view source to make it easier to access, understand, maintain, and use code.				
	GRI	Medium	Medium	Medium	Medium
2.9	Use a design system for interface consistency				
	Success Criterion				
☐	Use a formal design system when a project is large or has many contributors to improve performance, consistency, and sustainability. Choose a system based on web standards with reusable components and ensure your project only loads the components actually needed on the front end. Whether using a formal design system or not, always follow familiar design patterns and conventions.				
	GRI	Medium	Low	Medium	Low
2.10	Provide clear, inclusive content with purpose				
	Success Criterion				
☐	Write content using plain and inclusive language, at an appropriate reading level for your audience. Account for specific needs in relation to accessibility, native language, and internationalization.				
☐	Use appropriate formatting for digital media. Provide a clear document structure with consideration of visual hierarchy. Use headings, bulleted lists, line spacing, and highlights appropriately. Provide information with appropriate formatting for the action users need to take.				
	GRI	Medium	Low	Medium	Low
2.11	Optimize media for sustainability				
	Success Criterion				
☐	Do not include media unless it adds value. Consider the quantity, format, and sizes required.				
☐	Resize, optimize, and compress all media. Provide media in appropriate sizes for different screen resolutions, user device capabilities, and user needs. Optimize and compress media appropriately. Provide media in compatible and appropriate formats. Avoid non-native embedded media players.				

☐	Incorporate lazy/deferred loading from the start: Consider which media elements are immediately required, and which would be better relegated to loading on specific user interaction. Load data-intensive media on the client side, including the media itself, behind a facade - a non-functional and static representational element.				
☐	Disable auto-play functionality on audio, video, and similar media formats. Give the user full agency over media interactions, including a choice of resolutions and formats, and the option to deactivate media. Inform users of the length, format, and data intensity of the media. Provide the option for data-intensive media to be disabled or provide low-fidelity alternatives.				
☐	Set up a media management and use policy. Include criteria for media compression, rendering impact optimization, file formats, data retention, review, and deletion.				
	GRI	High	High	High	High
2.12	Ensure animation is proportionate and easy to control				
	Success Criterion				
☐	Use animation only when it adds value and not for decorative elements.				
☐	Progressively display an appropriate number of animations to avoid overburdening the user or negatively impacting device performance. This includes setting a maximum number of replays or iterations.				
☐	Allow users to start, stop, pause, or otherwise control animated content.				
	GRI	High	High	High	High
2.13	Use optimized and appropriate web typography				
	Success Criterion				
☐	Use pre-installed fonts, such as system fonts, wherever possible, to reduce the reliance on user-installed or web fonts.				
☐	Limit the number and complexity of fonts downloaded. When using a variable font, also restrict the supported axes and ranges to those required by your project whenever this reduces file size. Use the most performant file format available.				
☐	Design or subset fonts to omit unnecessary or unused stylistic variations, such as font weight or italics. Design or subset web fonts based on explicitly supported languages and Unicode scripts rather than assumed defaults. Where you are in full control of all input and output, fonts can be subset to include only the relevant Unicode range or character set. In all other instances - particularly where content is user-generated or affected by dynamic input and output - provide full script coverage and use a solution such as Incremental Font Transfer (IFT) to load the required segments of the font on demand.				
	GRI	Medium	Medium	Medium	Medium
2.14	Offer suitable alternatives for every format used				
	Success Criterion				
☐	Default to using open alternatives, such as HTML, over proprietary file formats.				
☐	Provide a suitable font stack as a fallback when custom typefaces are used.				
☐	Provide meaningful alternative text for all descriptive images that are non-decorative and support the user's understanding of the content, acting as a fallback if the images do not load.				
☐	Include transcripts and/or text versions of media files as an alternative to playing the media.				

☐	Include closed captions and subtitles along with transcripts for videos. Provide localization as expected by your audience, including subtitles and sign language that meet the same standard.				
	GRI	Medium	Medium	Medium	Medium
2.15	Provide accessible, usable, minimal web forms				
	Success Criterion				
☐	Remove unnecessary forms and reduce form content to the minimum necessary to meet the user needs while satisfying the organization's minimum requirements. Clearly communicate why a form is necessary, the value it provides, the number of steps required for completion, and what will be done with the collected data. Also disclose if the data will be shared with third parties.				
☐	Avoid using auto-completion or auto-suggest based on partial entry to conserve user bandwidth and reduce unnecessary server side requests. Support the use of helpful tooling, such as password managers, by not preventing autofill.				
	GRI	Medium	Low	Medium	Low
2.16	Provide useful notifications				
	Success Criterion				
☐	Remove non-essential notifications. Justify and reduce email, text message (SMS), and other invasive or energy-intense notifications to what is necessary. Use notifications, such as alerts for new content, with care and restraint. Make sure the users understand and give informed consent.				
☐	Allow users to adjust their own notification and messaging settings. Ensure the options to unsubscribe, log out, and close an account are available and visible. Optional notifications must be off by default and only activated upon user opt in. The user should be able to change their contact details.				
	GRI	Medium	Low	Medium	Low
2.17	Reduce the impact of downloadable and physical documents				
	Success Criterion				
☐	Design your process to reduce the need for paper documents. Where the production of paper documents is essential, it should be designed to have the lowest impact possible. Include a CSS print style sheet and test it with different types of content. Encourage saving documents in digital formats over paper-based storage and archiving.				
☐	Optimize and compress all downloadable documents. Make them available in a variety of accessible file formats.				
☐	Avoid duplicating effort. If a document will be reused, generate and save it once on the server side for reuse, ideally on a cookie-free domain.				
☐	Display the document name, a summary, file size, and format prior to downloading. Allow users to choose the right format and language for their needs where possible. Avoid embedding documents directly; provide a link to download or view them within the browser instead.				
	GRI	Medium	Low	Medium	Low
2.18	Involve users and contributors early in the project				
	Success Criterion				
☐	Outline processes used to prototype and test new features, product ideas, and user interface components. Test with real users who represent different perspectives and user constraints.				
	GRI	High	High	High	High

2.19	Audit and test for bugs or issues requiring resolution				
	Success Criterion				
☐	Evaluate current user experience and check the codebase for bugs, identify performance issues, and account for accessibility, sustainability, or security problems at appropriate regular intervals, such as every month or quarter.				
☐	Implement non-regression tests for all critical features.				
☐	Incorporate regression testing into each release cycle to ensure new features do not introduce bugs or otherwise conflict with existing functionality.				
☐	Identify and resolve bottlenecks or issues in the underlying code or infrastructure which could impact sustainability and performance to encourage a smooth, frictionless user journey. Consider both simulated and real-world metrics. Monitor performance across every release cycle using appropriate tooling or through research and auditing.				
☐	Collect only data required to provide a streamlined and effective user journey and comply with relevant accessibility and data protection legislation. Put policies in place to ensure strict adherence.				
	GRI	Medium	Medium	Medium	Medium
2.20	Verify that real-world users can successfully use your work				
	Success Criterion				
☐	Monitor user feedback, adoption, and churn rates in relation to different features and incorporate these insights into future releases.				
☐	Incorporate extensive usability testing, real user metrics, and user interviews into product cycles and routinely measure the impact of these tests for future releases. Validate whether released features meet internal goals and audience needs.				
	GRI	Medium	Medium	Medium	Medium
2.21	Regularly test and maintain compatibility				
	Success Criterion				
☐	Establish and maintain a compatibility policy which covers current and obsolete devices and software versions, listing the supported device brands, operating systems, and browsers (including versions). Update this regularly in line with new releases.				
☐	Avoid planned obsolescence. Strive to maintain compatibility for as long as possible and communicate clearly whether an update is evolutionary, as in large updates that can significantly reduce performance, or corrective, as in smaller updates that fix bugs or improve security.				
☐	Account for potential user constraints in various scenarios to ensure compatibility. Testing should cover weak, unstable, restricted, or slow connections, Virtual Private Network (VPN) use, operating system choice or version, browser, and the device age.				
☐	Use a PWA over a native mobile application if it meets sustainability, interoperability, and compatibility criteria.				
	GRI	High	High	High	High
3.1	Set goals based on performance and energy impact				
	Success Criterion				
☐	Set clear goals with performance and environmental impact in mind, then meet them. These could include, the number of requests or elements that must be rendered.				

☐	Consider differences in the energy intensity or testable impact across each component. For example, unstyled text is less computationally intensive to render than CSS, which in turn is less process-heavy than JavaScript, which is less resource-heavy than WebGL or 4K video.				
	GRI	Medium	Medium	Medium	Medium
3.2	Remove unnecessary or redundant information				
	Success Criterion				
☐	Remove unnecessary white space, comments, and other non-essential characters from code and data files to reduce file sizes and improve loading times. This applies to HTML, CSS, JavaScript, JSON, SVG, and other relevant file types.				
	GRI	Low	Low	Low	Low
3.3	Modularize bandwidth-heavy components				
	Success Criterion				
☐	Break down bandwidth-heavy components into smaller, modular segments that can be loaded only when required. This applies to both front-end and back-end code.				
	GRI	Medium	Medium	Medium	Medium
3.4	Remove unnecessary code				
	Success Criterion				
☐	Identify and eliminate unused and dead code, commonly within CSS and JavaScript.				
	GRI	Medium	Medium	Medium	Medium
3.5	Avoid redundancy and duplication in code				
	Success Criterion				
☐	Remove duplication and/or simplify and optimize your code for better performance, focusing on essential features so you have a cleaner, less redundant product and codebase.				
☐	Improve existing solutions rather than redeveloping and redesigning products from scratch, since the latter would duplicate the coding effort and maintenance burden for developers rather than reduce the learning burden for users.				
☐	Use organization methodology and systems such as Don't Repeat Yourself (DRY) to optimize the arrangement and output of your JavaScript and CSS.				
	GRI	Medium	Medium	Medium	Medium
3.6	Give third parties the same priority as first parties during assessment				
	Success Criterion				
☐	Assess third-party content and/or services (including plugins, widgets, feeds, maps, carousels, tracking scripts, and more) as early as possible in the ideation or creation process. Use as few as possible, preferring lighter, less complex solutions to reduce the overall environmental impact, including Scope 3 emissions. Ensure that third-party vendors enforce the same Compliance, Security, and Privacy standards as the first party. This includes data deletion policies, data retention limits, and mandatory security updates.				
☐	Use click-to-load triggers based on an import on interaction pattern to prevent automatic loading of third-party content and/or services (see above). Offer suitable alternatives to third-party use, for example, a link to a contact form as an alternative to a chat widget.				

☐	Host your content and assets, such as icons and widgets, directly on your own site rather than relying on third-party services to store, deliver, or embed those features.				
☐	Respect user preferences around the use of third-party products and services, similar to the implementation of cookie consent modals. Provide mechanisms to disable or refuse non-first-party features alongside explanations of their purpose unless it is possible to show these third-party features are critical for functionality.				
	GRI	High	High	High	High
3.7	Ensure code follows good semantic practices				
	Success Criterion				
☐	Use accurate markup according to the relevant standard(s).				
☐	Remove optional HTML elements, attribute quotes, and default attributes only when they do not negatively impact functionality, accessibility, or readability. Retain them when they enhance accessibility, maintain clarity without compromising on performance, or ensure consistent browser rendering.				
☐	Avoid using non-standard, deprecated, proprietary, or outdated formats and web standards. Only use such code where this is required to meet a documented customer need and if there is a justifiable benefit that cannot otherwise be met. Justifiable reasons could include compatibility with essential legacy systems and/or hardware, accessibility, or emissions reduction. Use polyfills only when necessary, and regularly audit code to see if they can be removed.				
☐	Prioritize the use of standard HTML elements and attributes. Only use custom elements or Web Components if you cannot use pre-existing elements or if you require them for the purposes of producing reusable design system components.				
☐	Use web platform features and APIs over writing your own.				
	GRI	Medium	Medium	Medium	Medium
3.8	Defer the loading of non-critical resources				
	Success Criterion				
☐	Defer loading of non-essential external assets or set these to load asynchronously to avoid a Flash Of Unstyled Content (FOUC).				
☐	Where external resources are required to be used upon the documents load, optimize loading using resource and priority hints.				
	GRI	Medium	Medium	Medium	Medium
3.9	Provide information to help understand the usefulness of a page				
	Success Criterion				
☐	Provide accessibility and usability aids, such as skip links and signposts, to help users find and navigate content.				
	GRI	Low	Low	Low	Low
3.10	Validate form errors and account for tooling requirements				
	Success Criterion				
☐	Identify errors through live validation and with feedback on submission.				
☐	Clearly label and identify required elements to ensure easy recognition for users using assistive technologies.				

☐	Always allow the copying and pasting of content (including passwords) from external sources.				
	GRI	Medium	Medium	Medium	Medium
3.11	Structure metadata for machine readability				
	Success Criterion				
☐	Include the required title element, plus any beneficial optional HTML head elements.				
☐	Include necessary meta tag references that are commonly recognized and used by user agents such as search engines. Follow recognized standards and vocabularies such as Friend of a Friend (FOAF) or RDFa.				
☐	Use microdata, structured data (e.g., Schema.org), or microformats in content where a widely used structured data format exists.				
	GRI	Medium	Medium	Medium	Medium
3.12	Use sustainability beneficial user preference media queries				
	Success Criterion				
☐	Accommodate common user preferences, such as prefers-color-scheme, with corresponding CSS media queries. Consider accounting for additional user preferences, including monochrome, prefers-contrast, prefers-reduced-data, prefers-reduced-transparency, and prefers-reduced-motion preference queries where these will benefit your users. Use print and scripting media queries when they can improve sustainability.				
	GRI	Medium	Medium	Medium	Medium
3.13	Ensure layouts work for different devices and requirements				
	Success Criterion				
☐	Use responsive and adaptive design techniques to ensure your project supports an wide range of devices and screen sizes, including smartphones, tablets, laptops, desktop computers, smart TVs, and other emerging platforms. Implement robust fallback strategies to ensure that the digital product or service will not fail if it encounters unsupported technologies.				
☐	Use progressive enhancement to enhance overall sustainability. This starts with baseline HTML, and increases the user experience without reliance on style and interaction to ensure a robust project.				
☐	Use carbon-aware design techniques to maximize your use of low-carbon energy. This is achieved by adapting the delivery of your project to current electricity availability and user grid load. This should include using situational design to reduce the codebase and disable non-essential functionality during high-intensity periods. Similarly, it should be possible to adapt the user interface to perform better with reduced hardware resources, where this measure can be taken to avoid scaling hardware resources and the resultant increase in emissions. It can also include designing algorithms that can automatically disable features based on set thresholds.				
☐	Support additional indirect methods of interaction, such as voice (speech), code (QR, etc.), reader view (browser, application, or RSS), or connected technologies (watch, appliance, transport, etc.).				
	GRI	Medium	Low	Medium	Low
3.14	Use standards-based JavaScript and APIs				
	Success Criterion				
☐	Improve sustainability through accessible and performant code.				

☐	Integrate energy-relevant APIs - such as Battery Status, Compression Streams, Page Visibility, or Vibration - where these can reduce energy consumption.				
☐	Call client- or server-side APIs only when necessary. Equally, ensure an API is optimized to only send data that is actually required.				
	GRI	High	High	High	High
3.15	Ensure that your code is secure				
	Success Criterion				
☐	Check scripts and associated code for vulnerabilities, exploits, header issues, and code injection.				
	GRI	Medium	Medium	Medium	Medium
3.16	Use dependencies appropriately and ensure maintenance				
	Success Criterion				
☐	Prevent developers from downloading and installing libraries and frameworks to run client-side when they are not needed by checking for unused dependencies. Follow up by uninstalling those that are not needed.				
☐	Limit your use of libraries and frameworks to the genuinely necessary as this will reduce the amount of code that has to be downloaded and parsed by the browser. Consider whether you can use plain code instead. Check the package size and whether individual modules can be installed and imported individually or a more performant alternative can be used in its place, as opposed to the entire library. Do not replace established and trusted security libraries with scoped-down or custom implementations. Custom security code increases vulnerability, which itself can negatively affect sustainability.				
☐	Regularly check dependencies and keep them up to date.				
	GRI	Low	Low	Low	Low
3.17	Include expected and beneficial files				
	Success Criterion				
☐	Include favicon.ico, robots.txt, opensearch.xml, site.webmanifest, and sitemap.xml files by default. Also ensure that any similar files defined in future web standards or specifications are included.				
☐	Include beneficial files such as ads.txt, carbon.txt, humans.txt, security.txt. Also ensure that any similar files defined in future web standards or specifications are included.				
	GRI	Low	Low	Low	Low
3.18	Use the most efficient solution for your service				
	Success Criterion				
☐	Identify the requirements and use this as a basis to help you select the most appropriate implementation for your project. A simpler technological implementation may use more human resources but could have a smaller footprint. A prebuilt solution may use more system resources and have a bigger emissions impact on render, but it could have a faster build time - meaning less carbon is emitted in development.				
☐	Use the most effective approach for your use case. Most of the time, coding from scratch will often provide the most performant results. Where an existing solution is present and is being actively maintained, this may be better optimized than what you can reasonably produce yourself. Favor native components and file systems over WYSIWYG editors - including visual page builders - or other heavy frameworks. Be mindful of the impact of third-party solutions.				

☐	Deliver static in place of dynamic content wherever possible. If you choose to use a code generation tool, then favor the most efficient tool available, such as Static Site Generators (SSGs). Content delivered by a dynamic CMS will involve much more server-side processing and uses bulkier libraries.				
☐	Carefully select and review plugins, extensions, and themes to maximize interoperability, accessibility, and performance. Audit these regularly over time to ensure continued compatibility.				
☐	Pay particular attention to user interface components with respect to their sustainability impact.				
	GRI	Medium	Medium	Medium	Medium
3.19	Use the latest stable language version				
	Success Criterion				
☐	Use the latest build of your chosen syntax language and its coupled framework.				
☐	Use the most appropriate programming language for the task. Many tools and programming languages are optimized for the performance of particular tasks. Applying the most appropriate tools to the problem can justify any time or effort involved in their adoption, especially if there is a reasonable user base, provided it does not impact the wellbeing of those involved or risk becoming cost-prohibitive.				
	GRI	Medium	Medium	Medium	Medium
3.20	Reduce the number and complexity of database queries				
	Success Criterion				
☐	Optimize database queries, especially for frequently accessed information. If you need information that is stored in a database, and you require it or it is likely to be requested more than once in your code, the database should only be accessed once and the data stored locally for subsequent processing. Avoid relying on framework helpers that might defer filtering to later in the process. Practice good database hygiene with data modeling best practices such as data minimization, such as Time-to-Live (TTL), de-identification, UUIDs, and purpose limitation.				
	GRI	Low	Low	Low	Low
4.1	Choose a sustainable service provider				
	Success Criterion				
☐	Monitor, request, and track key indicators to assess and transparently report the environmental impact of hosting and identify overconsumption. Prioritize indicators of energy and water usage, even if you are using an "all-in-one" full service hosting provider. For people who set up and configure their hosting, track hardware factors, such as CPU usage and memory usage. Similarly, track the allocation of servers and CPU cores to optimize resource efficiency. Consumers should monitor and providers should both calculate and transparently share environmental impact metrics. Metrics should include Power Usage Effectiveness (PUE), Water Usage Effectiveness (WUE), and Carbon Usage Effectiveness (CUE).				
☐	Both hosting providers and consumers should maintain hardware to extend its lifespan as long as possible. Use it efficiently at an appropriate capacity, verify it has up-to-date security patches, and ensure it has the necessary certifications. New purchases should be from reliable long-lifespan suppliers. Hosting providers should have a policy for extending hardware lifetime.				
☐	Use electricity with the lowest possible carbon intensity. Examine location-based emissions factors to calculate the carbon intensity of available electricity from the regional grid. Include the impact of on-site electricity generation, backup generators, and storage systems in calculations.				

☐	Work to ensure hosting and infrastructure adheres to GHG Protocol Scope 2 guidance on market-based carbon emissions accounting, seeking to match the time and location of location-based emissions from electricity consumption with purchases of low-carbon electricity.				
☐	The impact of domain names is disclosed by domain registries and registrars. Registrants should consider and (where possible) mitigate environmental impact when making registration decisions.				
	GRI	Low	Low	Low	Low
4.2	Optimize caching and support offline access				
	Success Criterion				
☐	Use server-side caching where possible to reduce processing time and repeated database lookups or API calls. Configure caching via server settings to control file-type expiration using appropriate headers, such as Expires or Cache-Control. Cache dynamic page responses where possible to serve static versions to future users. Support client-side caching of frequently used static assets to minimize repeat server requests.				
☐	Ensure resources remain available and accessible even if the user is disconnected, using methods such as JavaScript Service Workers, Web Workers, and browser local storage features.				
	GRI	Medium	High	Medium	High
4.3	Reduce data transfer with compression				
	Success Criterion				
☐	Use server-side compression to reduce file sizes before delivery. Server-side compression settings and tools can be used to compress most commonly used file types, reducing energy consumption while minimizing load times, saving bandwidth, and improving overall performance.				
☐	Use media compression tools to reduce the file size of images, videos, audio, and any other media before uploading to a server.				
	GRI	Low	Low	Low	Low
4.4	Setup necessary error pages and redirection links				
	Success Criterion				
☐	Set up proper error handling and error pages to clearly inform users when something goes wrong, guide them back to useful content, and maintain a consistent, trustworthy experience.				
☐	Regularly audit to check for broken and outdated links. Update these as necessary and add redirects to guide users and search engines to the correct content to ensure efficient browsing and protect SEO value. Test all redirects to ensure they function as intended and avoid impactful redirect loops. Favor the most efficient redirection platform.				
	GRI	Low	Low	Low	Low
4.5	Avoid maintaining unnecessary virtualized environments or containers				
	Success Criterion				
☐	Reduce the number of active environments by deactivating and/or offlining unused or redundant virtual (e.g., containers, virtual machines) or physical environments wherever this can be done without reducing the required security, isolation, or compliance guarantees. Where applicable, also evaluate running services in the same way. Similarly audit codebases and setups for unused branches, environments, and services and prune as appropriate.				
	GRI	Low	Low	Low	Low
4.6	Use automation wisely				

	Success Criterion				
☐	Automate recurring tasks, such as deployment, testing, and compilation in alignment with continuous integration and continuous delivery best practices.				
☐	Run automated tasks only when necessary to reduce unnecessary resources/resource utlisation/ processing cycles.				
☐	Use automated scaling to adjust server capacity based on demand, ensuring efficient resource allocation during traffic spikes. Implement buffering and throttling to manage load and maintain performance without overprovisioning. Also use automation to promptly scale resources back down based on demand.				
☐	Restrict the activity of unwanted and unnecessary third-party crawlers, suspicious user agents, unwanted users, bots, and scrapers from accessing or downloading your content. Follow best practices, such as server access rules and security tools, while ensuring your content remains accessible to users, search engines and any helpful, welcome crawlers. Consider that scrapers may be used to inform and train large language models.				
	GRI	Low	Low	Low	Low
4.7	Define the frequency of data refreshes				
	Success Criterion				
☐	Define the refresh frequency for the cache, local data, and page content based on user needs. Verify performance, data accuracy, and resource efficiency.				
	GRI	Medium	Medium	Medium	Medium
4.8	Back up critical data at routine intervals				
	Success Criterion				
☐	Ensure backups of system and user data are secure and incremental to minimize storage use, reduce backup time. Establish mechanisms to prevent user identifiable information from being stored long term, limit access, and protect against data loss or breaches.				
	GRI	Low	Low	Low	Low
4.9	Consider the impact and requirements of data processing				
	Success Criterion				
☐	Use existing and supported carbon-aware computing methods to automate batching and scheduling according to real-time electrical grid carbon intensity data or shift workloads to lower-carbon regions to optimize sustainability while maintaining performance.				
☐	Choose communication protocols appropriate to user needs and the type of data being transferred. Avoid insecure options such as HTTP and FTP, and prioritize secure, efficient alternatives such as HTTPS and SSH. Use modern protocols to take advantage of newer sustainability features, while maintaining backward compatibility for older devices.				
☐	Consider using event-driven architecture and microservices when building products with state changes that do not require full page refreshes. Favor these where they offer a more energy-efficient alternative to traditional APIs based on performance, power, and processing factors. Choose the approach that reduces server workload and environmental impact.				
☐	Avoid redundant processing. When data processing is necessary, carefully compare the relative effects of client- versus server-side processing based on efficiency, performance, security, and sustainability metrics to make an informed decision.				
	GRI	Low	Low	Low	Low

4.10	Use Content Delivery Networks (CDNs) appropriately				
	Success Criterion				
☐	Deploy static content, assets, and other read-only resources via a Content Delivery Network (CDN) on a case-by-case basis, where judged to be beneficial. Carefully evaluate the environmental impact of any CDN service used, similar to a web hosting provider.				
☐	Select CDN providers that make commitments to sustainability and report on their progress.				
☐	When serving an exclusively local audience, consider whether a CDN is required at all. Instead, select hosting providers with servers close to your target audience.				
☐	Avoid deploying dynamic or frequently changing resources to a CDN. Browser behaviors such as cache partitioning and cross-origin resource sharing (CORS) can limit performance gains, hinder caching and interaction, and attempting to override these can introduce security or privacy risks. This does not apply to static assets or JSON files, which are well suited to CDN delivery.				
☐	Perform data transformations, transfers, and processing between the layers of an application as close to the source as possible. This reduces unnecessary serialization overhead and avoids wasting resources.				
	GRI	Low	Medium	Low	Medium
4.11	Infrastructure decisions must meet business requirements				
	Success Criterion				
☐	Select infrastructure that meets your requirements and customer agreements without over-provisioning. Favor standalone instances over multi-zone or distributed setups when requirements allow. Provision for average loads rather than peaks to ensure efficient resource use. Use autoscaling to handle fluctuations without underutilizing infrastructure.				
	GRI	Low	Low	Low	Low
4.12	Store data according to the needs of your users				
	Success Criterion				
☐	Regularly audit for and delete so-called "dark data" that is single-use, redundant, or abandoned in order to reduce storage demand and energy use.				
☐	Assign expiration and/or maximum retention dates to stored data where appropriate, treating excess data as a form of technical debt. Observe any applicable minimum data retention periods. Make data cleanup an established organization-wide routine to prevent long-term data accumulation.				
☐	Implement a data classification and tagging policy to improve visibility, simplify management, and enable efficient removal of outdated or unused data.				
☐	Store data only when it cannot be easily or accurately regenerated.				
☐	Optimize log collection and storage by scheduling backups during low-activity hours, rotating logs appropriately, and using off-site, sustainable providers. Establish mechanisms to ensure identifiable user information does not appear in logs to reduce security and privacy risks and exposure.				
☐	Make large, long-term assets available for easy download when in persistent use so users are not required to re-access the server for repeat downloads.				
	GRI	Low	Low	Low	Low
5.1	Have an ethical and sustainable product strategy				

	Success Criterion				
☐	Develop, publish and maintain key policies, such as a code of ethics, product guidelines, sustainability statements, and/or other documents that include language specific to digital products, services, policies, and programs. Address public concerns around AI and relevant emerging technologies with public-facing policies. Make these publicly accessible and transparently versioned formats.				
☐	Publish achievements, features, compliance, and anything beyond the scope of these guidelines within a dedicated sustainability section.				
☐	Provide evidence to demonstrate how digital sustainability policies, climate policies, and related practices are effectively implemented, monitored, and governed over time.				
☐	Advocate for and comply with responsible legislation that supports employment rights, transparency, and accountability related to sharing economic benefits, along with policies that impact your organization in relation to emerging technologies and/or digital sustainability.				
	GRI	High	High	High	High
5.2	Assign a sustainability advocate				
	Success Criterion				
☐	Assign a sustainability advocate with specific digital expertise and provide them with the resources, budget, tools, and time they need to achieve their stated goals. In some organizations, expanding this into a climate working group comprising motivated individuals can add further benefits.				
	GRI	Medium	Medium	Medium	Medium
5.3	Inform, raise awareness, and train for sustainability				
	Success Criterion				
☐	Produce, provide, and/or facilitate the delivery of onboarding materials and workshops to everyone connected to your project. This includes team members, contributors, colleagues, and organizational decision-makers - both within and external to the organization - to properly educate all regarding general and digital climate literacy, as well as your own sustainable technology policies.				
☐	Provide active and routine training where possible to develop, establish, and refresh skills relating to sustainability. This can be delivered as in-house training, courses, workshops, events, webinars, meetups, or other ongoing or on-demand methods that support your team in achieving sustainability objectives.				
☐	Encourage participants to reduce their environmental impact. Share climate and sustainable initiatives and ideas. Provide resources on sustainable design, best practices, and concepts to assist them.				
☐	Create and/or deliver dedicated training manuals, workshops, and materials to outline the sustainability policies and practices adopted and how to implement them. Manage and maintain these materials over time, adapting them as new policies and best practices arise.				
☐	Incentivize leadership, teams, and individuals to make progress toward the goals outlined in their training. Examples include dedicating time for sustainability-related activities, recognizing completion, and other benefits.				
	GRI	Medium	Medium	Medium	Medium
5.4	Communicate the environmental impact of user choices				
	Success Criterion				

☐	Clearly communicate the environmental impact of different user choices and allow users to configure settings based on the information provided.				
	GRI	Medium	Medium	Medium	Medium
5.5	Calculate the environmental impact				
	Success Criterion				
☐	Conduct a life-cycle analysis/assessment (LCA) to define sustainability-related functional unit impacts throughout a project's lifetime.				
☐	Calculate the environmental impact of your project compared to that of market alternatives to inform decision-making targets. Establish the need for your product by comparing the value offered by your project compared to these same alternatives.				
☐	Include the impact or estimated impact of any tooling or third-party solutions used at any stage in your pipeline. While not created by you, the emissions generated in production, maintenance, and use are also integral to your overall solution.				
	GRI	Medium	Medium	Medium	Medium
5.6	Define clear organizational sustainability goals and metrics				
	Success Criterion				
☐	Define and publish a clear set of sustainability goals. Publicly communicate how these goals can be met, including which performance metrics can be measured to help the organization and its various affected parties act more sustainably.				
	GRI	Low	Low	Low	Low
5.7	Validate efforts using established third-party certifications				
	Success Criterion				
☐	Obtain one or more sustainability certifications and incorporate operational policies and practices in alignment with their guidance.				
☐	Maintains sustainability certifications through continuing to meet their criteria and evolving policies and practices over time.				
	GRI	Medium	Medium	Medium	Medium
5.8	Support mandatory disclosures and reporting				
	Success Criterion				
☐	Create and publish policies and practices to disclose the social and environmental impacts of its products, programs, and services in line with existing reporting standards such as GRI, SASB, etc.				
☐	Produce a publicly available impact report outlining progress compared to previous reports on social and environmental goals at least once per year.				
☐	Publicly and transparently demonstrate commitment over time to following and adopting existing and/or emerging environmental standards and legislative policy that promotes mandatory emissions disclosures and reporting.				
☐	Clearly identify how environmental impact is being reduced, with careful avoidance of double accounting, greenwashing, data exclusion, or other misleading or manipulative techniques.				
	GRI	Medium	Medium	Medium	Medium
5.9	Create one or more impact business models				

	Success Criterion				
☐	Complete and operationalize a theory of change process with requisite documentation to identify the impact the organization aspires to achieve, how it will generate revenue, how it will create shared or added value from these activities, and how it will measure results based on desired outcomes. In the case of projects already underway, how these are generating revenue and actively tracking and measuring progress against desired outcomes.				
	GRI	High	High	High	High
5.10	Follow a product management and maintenance Strategy				
	Success Criterion				
☐	Produce and maintain documentation to outline how the organization approaches product management and maintenance.				
☐	Establish maintenance and security plans for all digital products and services.				
☐	Ensure that products, prototypes, testing, and supporting processes are sufficiently resourced over time - including staffing and budgeting - so that teams can maintain capacity, address technical debt, refactor code, introduce new features, support long-term care and maintenance, and avoid project abandonment for customers, users, and all affected parties.				
☐	Incorporate carbon and resource measurement into maintenance programs and show measurable improvement over time.				
☐	Identify and document Key Failure Indicators (KFIs) and implement resolutions to prevent negative sustainability impacts.				
	GRI	High	High	High	High
5.11	Implement continuous improvement procedures				
	Success Criterion				
☐	Establish policies and practices to enable continuous improvement and resource practices appropriately to support these efforts over time.				
☐	Review deliverables and update frequency to ensure project teams have enough time to conduct user research, identify technical debt, and produce high-quality output as well as share what they learned.				
☐	Display a track record of continuous improvement (iteration) processes to analyze the digital product or service. Simultaneously address any potential consequences of ongoing experimentation, such as technical debt, product performance, and emissions. Analytics are limited to strictly necessary features that aid decision-making, encouraging user feedback, and comparing performance against organization goals and user needs.				
☐	Justify and prioritize the retention of existing features, the creation of new functionality, and the decommissioning or elimination of unused functionality or low-traffic content throughout the product's life cycle on a case-by-case basis.				
☐	Provide corrective security and policy updates during the product or service life cycle. These should be distinguished from more extensive evolutionary updates.				
☐	Develop sustainable product and data strategies using appropriate training techniques. These should help your team build capacity and learn new skills to manage and maintain products and services over time.				
	GRI	High	High	High	High
5.12	Document future updates and evolutions				

	Success Criterion				
☐	When a feature is added, updated, or removed to improve user experience, clear documentation of the changes is provided in a well structured, semantically versioned document.				
	GRI	Low	Low	Low	Low
5.13	Establish if a digital product or service is necessary				
	Success Criterion				
☐	Identify where the product or service aligns with one of the U.N. (SDGs) and its appropriate targets within a sustainability statement.				
☐	Determine that the product or service is necessary based upon desirability, feasibility, and viability factors.				
☐	Remove or alleviate any obstacles to using a product or service, such as accessibility, equality, technical, or territorial.				
	GRI	High	High	High	High
5.14	Provide a supplier standards of practice document				
	Success Criterion				
☐	Create specific policies to vet potential partners along the supply chain based on sustainability principles.				
☐	Partner with suppliers to create, track and measure impact on issues that impact affected parties.				
☐	Promote and disclose partnerships in a publicly available place, along with information on how the partnership creates a collective impact.				
	GRI	High	High	High	High
5.15	Share economic benefits				
	Success Criterion				
☐	Publicly commit to paying employees, contractors, and other affected parties a living wage.				
☐	Have policies and practices to incentivize affected parties, such as workers and contractors, to meet impact goals.				
☐	Provide benefits to employees in accordance with resources, including, where relevant, healthcare, retirement planning, flex time, profit sharing, and more.				
	GRI	High	High	High	High
5.16	Share decision-making power with affected parties				
	Success Criterion				
☐	Assign all affected parties, from users to project managers, an equitable role in the decision-making process. Ensure all internal involved parties have the necessary power and autonomy to make key decisions on the organization's behalf. Where an autonomous system is able to make automated decisions, it must be possible to opt out, object, withdraw, and restrict the use of personal data. Any autonomous process must also be made as transparent as possible with evidence-based assurances that the metrics used are not biased. Affected parties must be able to obtain details about how the decision was made and offered a means to challenge decisions with human oversight.				
	GRI	Low	Low	Low	Low

5.17	Use Justice, Equity, Diversity, Inclusion (JEDI) practices				
	Success Criterion				
☐	Document commitments to JEDI practices with clear policies on how marginalized or otherwise underserved communities are prioritized.				
☐	Establish a publicly displayed accessibility policy and demonstrate this via accessible digital products or services.				
☐	Provide JEDI-related training materials and schedule regular workshops related to how this topic manifests itself in digital products and services, covering topics such as algorithmic bias, digital divide, employment, mis- and disinformation.				
☐	Show measurable improvement over time across hiring, leadership, and operations.				
	GRI	High	High	High	High
5.18	Promote responsible data practices				
	Success Criterion				
☐	Maintain a publicly accessible privacy policy, terms and conditions, and any other documents as required by law in the jurisdictions in which the product or service operates. Adhere to the most restrictive data protection regulations, especially when providing services outside the organization's country. Provide documents in accessible formats and use clear, user-friendly language to ensure comprehension by all users. Avoid unnecessary jargon, technical language, and legalese. Support emerging legislation and implement best practices related to data privacy, sustainability, and responsible data management.				
☐	Demonstrate measurable progress over time in regard to respecting data privacy and ownership. Specify how opt-out will be handled along with ownership rights. Data deletion or "Right to be forgotten" requests must immediately propagate to databases and local caches. Cached data must not persist after a user has revoked consent or deleted their account. Also provide the ability to download or export data created by or in relation to the user in a non-proprietary format.				
	GRI	High	High	High	High
5.19	Implement appropriate data management procedures				
	Success Criterion				
☐	Archive and delete outdated or otherwise expired product content and data via automated expiration dates and scheduled product audits. Publish the archiving schedule, ensuring a lightweight version of the old searchable content is maintained for those that may require it.				
☐	Allow users to control, manage, and delete their data, subscriptions, and accounts.				
	GRI	Low	Low	Low	Low
5.20	Establish responsible practices around AI and emerging or disruptive technologies				
	Success Criterion				
☐	Ensure all technologies that deploy or create large datasets use data that is appropriately scaled and stored, ethically sourced, screened, validated, and implemented in a non-discriminatory, responsible manner.				
☐	Show how members of your organization are supported in the process of adapting to the rise of new technologies that could disrupt the organization's business model or operational norms.				

☐	Audit and account for any environmental considerations associated with the promotion or adoption of AI or any emerging or disruptive technologies. This should include third-party choices, and the associated waste or emissions per use and those incurred as a consequence of deployment.				
☐	Ensure all automated tooling, scrapers, spiders, bots, artificial intelligence, and other forms of machine-assisted data gathering abides by requests to opt out at the host, server, or website level. Providers must declare themselves as non-human within the user-agent/HTTP header. Providers must also publish impact reports relating to their gathering activities.				
☐	Do not roll out post-quantum encryption for high-traffic services that do not need resilience against harvest now, decrypt later attacks, where attackers steal encrypted data, anticipating that future quantum computers will be powerful enough to break the encryption and make the data readable at a later date.				
	GRI	High	High	High	High
5.21	Include responsible financial policies				
	Success Criterion				
☐	Divest from fossil fuels and move banking, sponsorship, and other affiliations to more responsible partners.				
☐	Engage in flexible financing and responsible budgeting to accommodate long-term care and maintenance.				
	GRI	High	High	High	High
5.22	Include organizational philanthropy policies				
	Success Criterion				
☐	Establish a clear corporate giving policy and create philanthropic partnerships with strategically aligned organizations.				
☐	Engage in free or volunteer projects to help teams learn new tools and tactics, while also helping charities and non-profit organizations to build capacity.				
	GRI	High	High	High	High
5.23	Plan for a digital product or service's care and end-of-life				
	Success Criterion				
☐	Provide clear, documented end-of-life guidelines that include data disposal, archiving, file deletion, and other relevant guidance.				
	GRI	Medium	Medium	Medium	Medium
5.24	Include e-waste, right to repair, and recycling policies				
	Success Criterion				
☐	Responsibly recycle or upcycle unwanted hardware or materials. Materials should be recovered, redeployment, and reused, where possible, or otherwise disposed of sustainably. Service providers should have a policy for responsible e-waste management.				
☐	Establish specific policies around e-waste recycling and repair owned technology products whenever possible.				
☐	Form relationships with local partners for e-waste recycling and repair.				
☐	Buy refurbished equipment whenever possible.				

☐	Allow consumers to repair the consumables they purchase to the best of their ability, offering replacement components if possible at cost, and provide clear instructions to help resolve faults that occur.				
	GRI	High	High	High	High
5.25	Define performance and environmental budgets				
	Success Criterion				
☐	Define and document clear digital sustainability budget criteria that covers impact from asset and resource creation to consumption. Communicate this to affected parties.				
☐	Use a performance budget to set a target maximum size of your digital product or service to monitor and reduce impact of data transfer, file type size, and more.				
☐	Define KPIs around engineering hours, development time, or sprints while keeping the health and well-being of your workers paramount. Sustainably optimize workflows to allow all tasks to be performed with care.				
☐	Establish a baseline and measurement criteria to track improvements over time. Improvement claims must be evidenced and verifiable.				
	GRI	Medium	Medium	Medium	Medium
5.26	Use open source where possible				
	Success Criterion				
☐	Establish a clear open source policy that outlines how open-source tools are used and any practices used to support open-source development.				
☐	Show a track record of collaboration and building communities around open-source principles.				
☐	Contribute regularly in terms of code, human-time, and/or financially, to open-source community-based projects.				
	GRI	Medium	Medium	Medium	Medium
5.27	Create a business continuity and disaster recovery plan				
	Success Criterion				
☐	Create, regularly review, and occasionally test a plan of action to determine readiness in case of an incident and establish procedures to quickly recover from any incident.				
☐	Maintain regular and transparent communication with the audience regarding issues that may affect service delivery or user data.				
	GRI	Low	Low	Low	Low