

PAS 51215-1:2025

Energy and decarbonization assessment – Part 1: Process – Specification



Department for
Energy Security
& Net Zero

Full document details: PAS 51215-1:2025



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Published by BSI Standards Limited 2025.

ISBN 978 0 539 23452 7

ICS 03.120.20, 13.020.40, 27.010, 27.015

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Publication history

First published February 2025

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Foreword

This PAS was sponsored by the Department for Energy Security and Net Zero. Its development was facilitated by BSI Standards Limited and it was published under licence from The British Standards Institution. It came into effect on 28 February 2025.

Acknowledgement is given to Kit Oung, as the technical author, and the following organizations that were involved in the development of this PAS as members of the Steering Group:

- Carbon Trust
- CIBSE Certification Ltd
- City Football Group
- Co-opted members (two members)
- Department for Energy Security and Net Zero
- Energy Managers Association (EMA)
- Energy Saving Trust
- Energy Services and Technology Association (ESTA)
- Environment Agency
- Institute of Environmental Management and Assessment (IEMA)
- Institution of Chemical Engineers (IChemE)
- Institution of Environmental Sciences (IES)
- Jacobs
- Property Energy Professionals Association (PEPA)
- Scottish Environment Protection Agency (SEPA)
- Skanska
- StarLiX
- Verco Advisory Services

Acknowledgement is also given to the members of a wider review panel who were consulted in the development of this PAS.

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Supersession

This PAS, along with PAS 51215-2:2025, supersedes PAS 51215:2014, which is withdrawn.

Relationship with other publications

This PAS specifies the process requirements for conducting an energy and decarbonization assessment, as well as the output of such an assessment. The process set out in the PAS includes the identification of opportunities for the organization being assessed to improve energy performance and reduce greenhouse gas (GHG) emissions, and the production of an implementation plan for achieving net zero within the boundary of the assessment.

PAS 51215-1 is related to PAS 51215-2 which specifies the competencies necessary for a person to be deemed capable of:

- a) planning an energy and decarbonization assessment;
- b) leading an assessment team; and
- c) reviewing and approving the output of an energy and decarbonization assessment.

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Presentational conventions

The provisions of this PAS are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. “organization” rather than “organisation”).

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In particular, attention is drawn to the following specific regulations:

- Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013 [1];
- Companies (Directors' Report) and Limited Liability Partnerships (Energy and Carbon Report) Regulations 2018 [2];
- The Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022 [3];
- The Environmental Permitting (England and Wales) Regulations 2016 [4];
- Environmental Better Regulation Act (Northern Ireland) 2016 [5];
- The Pollution Prevention and Control (Scotland) Regulations 2012 [6];
- The Building Regulations 2010 [7], as amended from time to time;
- The Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015 [8]; and
- The Energy Savings Opportunity Scheme Regulations 2014 [9], as amended from time to time.

Statement by the Department for Energy Security and Net Zero

The Energy Savings Opportunity Scheme (ESOS) was introduced in 2014 to require large businesses and their corporate groups in the UK to carry out assessments of the energy used by their buildings, transport and industrial processes at least every four years. ESOS assessments provide participants with tailored information on cost-effective ways to reduce their energy consumption.

When ESOS was first introduced, the former Department of Energy and Climate Change (DECC) sponsored the development of BSI PAS 51215:2014 in order to establish competencies for lead assessors conducting an ESOS assessment.

Following the July 2022 response [10] to a consultation [11] on strengthening ESOS, which set out proposals to include net zero considerations in ESOS assessments, the Department for Energy Security and Net Zero has sponsored BSI's revision of the existing PAS 51215:2014 into two documents. These cover firstly, the process for conducting an energy and decarbonization assessment and secondly, the competencies required for an assessor and assessment team to conduct such an assessment.

The government aims for these PAS documents to set out the requirements which can be applied to ESOS-compliant energy and decarbonization assessments and the competencies needed to conduct such assessments. The boundary of the assessment covered by PAS 51215-1 and PAS 51215-2 has therefore been set at a minimum to cover the energy consumption and resultant GHG emissions which correspond to the scope of energy consumption to be covered by ESOS assessments under the proposals set out in the consultation response [10]. However, it is also intended that these PAS standards set out a framework for organizations which wish to go further and consider the full range of actions that need to be taken to achieve net zero across the organization's complete scope 1, 2 and 3 emissions by 2050 or before.

PAS 51215-1 sets out the requirements for conducting energy and decarbonization assessments. It has been designed to be applicable for iterative assessments, so that as part of the PAS process recommendations for future assessments are provided. For those organizations currently complying with ESOS using an accredited BS EN ISO 50001 energy management system or by using energy audits compliant with ISO 50002 or BS EN 16247, the PAS also sets out the additional activities to be taken in order to be compliant with proposed ESOS requirements.

NOTE Further details on the Energy Savings Opportunity Scheme (ESOS) are given at <https://www.gov.uk/guidance/energy-savings-opportunity-scheme-esos>.

0 Introduction

0.1 Motivation for the creation of PAS 51215-1 and PAS 51215-2

In June 2019, the UK became the first major economy to introduce a legally binding target to bring all GHG emissions to net zero by 2050¹⁾. In order to meet this stretching target, all sectors of the economy will need to rapidly decarbonize to ensure that the UK as a whole is net zero by 2050.

Research carried out for the UK Government [12] identified that although the vast majority of organizations (98%) are aware of the UK's net zero target, a third do not understand what this means for their organization. While there are various existing standards for measuring and monitoring GHG emissions, and there are also existing standards for carrying out an energy audit to identify opportunities for saving energy, there is no standard for a combined assessment to identify and evaluate the costs and benefits of options for organizations to decarbonize to meet net zero. This PAS aims to set out a standard for energy and decarbonization assessments which can fill this gap.

In 2014, the UK Government introduced the Energy Savings Opportunity Scheme (ESOS), which requires large undertakings to carry out assessments of the energy consumed in their buildings, transport and industrial processes at least every four years, or to use an alternative compliance route such as BS EN ISO 50001 certification covering the same scope.

NOTE 1 For current information on ESOS, see <https://www.gov.uk/guidance/energy-savings-opportunity-scheme-esos>.

When ESOS was first developed, the former Department of Energy and Climate Change (DECC) sponsored the development of BSI PAS 51215:2014 in order to establish competencies for lead assessors conducting an ESOS assessment.

In July 2022, the government response [10] to a 2021 consultation on strengthening ESOS [11] set out proposals to include a net zero element within ESOS.

The Department for Energy Security and Net Zero has consequently sponsored BSI's revision of the existing PAS 51215:2014 into two documents:

- PAS 51215-1, *Energy and decarbonization assessment – Part 1: Process – Specification*. This PAS describes a harmonized process for conducting an energy and decarbonization assessment. Providing a harmonized approach to energy and decarbonization assessments can increase the visibility, transparency and comparability of the assessment and the identified improvement opportunities. This approach can reduce uncertainties in organizational expectations and create confidence that the improvement opportunities are relevant and appropriate to the organization.
- PAS 51215-2, *Energy and decarbonization assessment – Part 2: Competencies of lead assessors and assessment teams – Specification*. PAS 51215-2 updates PAS 51215:2014 by strengthening the existing energy competencies and incorporating competencies related to GHG emissions, decarbonization and net zero. This PAS describes the competencies required for a person to function as a lead assessor and a group of people to function as the assessment team. When an energy and decarbonization assessment is conducted by a suitably competent assessment team, led by a lead assessor, confidence in the output from an assessment increases, and the risk of investment by organizations decreases.

¹⁾ See <https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law>.

It is intended that PAS 51215-1 is to be used by ESOS lead assessors to conduct energy and decarbonization assessments that comply with proposed requirements for including net zero within ESOS, as set out in the 2022 government response [12] to the ESOS consultation [13]. It is important to note that while the motivation for the creation of PAS 51215-1 was to facilitate compliance with ESOS, it is not exclusively tied to ESOS and can be used by any organization that wants to carry out an assessment to identify improvement opportunities to decarbonize and reach net zero by 2050 or before.

Annex A gives an indication of the additional activities for organizations using BS EN ISO 50001 as a compliance route. Annex B gives an indication of the additional activities for organizations using BS EN 16247 or ISO 50002 as a compliance route.

NOTE 2 *At the time of publication, complying with the ESOS scheme requires carrying out an energy audit, which is recommended in ESOS guidance to be based on standards such as the BS EN 16247 series and ISO 50002, or by using one of the following alternative routes to compliance:*

- a) *fully certified BS EN ISO 50001 energy management system;*
- b) *Display Energy Certificate and accompanying report;*
- c) *Green Deal Assessment; or*
- d) *a combination of the above.*

These revisions to the existing PAS 51215:2014 have been developed through a consensus-driven, formal development process, with involvement from key stakeholders and public consultation.

PAS 51215-1:2025 and PAS 51215-2:2025 supersede PAS 51215:2014, which is withdrawn.

0.2 Why is it important for organizations to decarbonize and achieve net zero?

Without taking effective action to keep global temperature rises from anthropogenic climate change below 2 °C, the risk of serious consequences such as extreme heatwaves, sea level rises and irreversible changes to climate and weather patterns becomes extremely likely. For this reason, in 2015, 196 countries adopted the Paris Agreement [13] to limit global warming to well below 2 °C and preferably to 1.5 °C, compared to pre-industrial levels.

In order to achieve this goal, all signatories aim to achieve a climate neutral world, i.e. net zero, by 2050. Net zero means that residual GHG emissions are balanced by GHG removals over a specified period and assessment boundary. Given the limited number of options for verifiable emissions removal, meeting this global net zero goal will require individual organizations to reduce their energy consumption, decarbonize, and get as close as possible to absolute zero emissions by 2050.

This goal cannot be reached without all organizations doing their part, and in recognition of this, the UN set up the Race to Zero initiative to engage organizations in meeting net zero goals. The Race to Zero initiative requires participating organizations to ensure that their own operations are net zero by 2050 or before.

NOTE *For more information on the UN's Race to Zero initiative, see <https://climatechampions.unfccc.int/>.*

The Intergovernmental Panel on Climate Change (IPCC) *Special Report on Global Warming of 1.5 °C* [14] also identified that, to keep global temperature rises below 1.5 °C, an interim target of halving global emissions by 2030 is needed. The UN Race to Zero emphasizes the importance of organizations setting out their own interim targets that are consistent with this ambition.

Some industries and sectors are hard to decarbonize, as the technology is either not commercially viable or not close to being commercialized. However, organizations in these sectors can still benefit from an energy and decarbonization assessment to identify the risks to the organization and generate a plan to address these. Large-scale implementation of energy and decarbonization assessments, on either a mandatory or voluntary basis, can help organizations to identify a large range of options to reduce energy consumption, decarbonize, and achieve net zero.

0.3 How can an energy and decarbonization assessment help organizations achieve net zero?

An energy and decarbonization assessment is an assessment of an organization's energy consumption and GHG emissions which identifies opportunities for improvement. The end goal of the assessment is to produce a decarbonization plan for the organization to achieve net zero by 2050 and any interim targets applicable to the organization's legal and other requirements. Where the boundary of the energy and decarbonization assessment does not include all GHG emissions within the organization's control and influence, the decarbonization plan makes recommendations for future assessments to be carried out which can address this disparity.

GHG emissions are usually consolidated into three broad categories at an organizational level:

- a) Scope 1 – GHG emissions from sources owned or directly controlled by the organization.
- b) Scope 2 – GHG emissions occurring as a consequence of the purchase and consumption of energy by the organization.
- c) Scope 3 – GHG emissions that are a consequence of the organization's activities but arise from sources that are not owned or directly controlled by the organization.

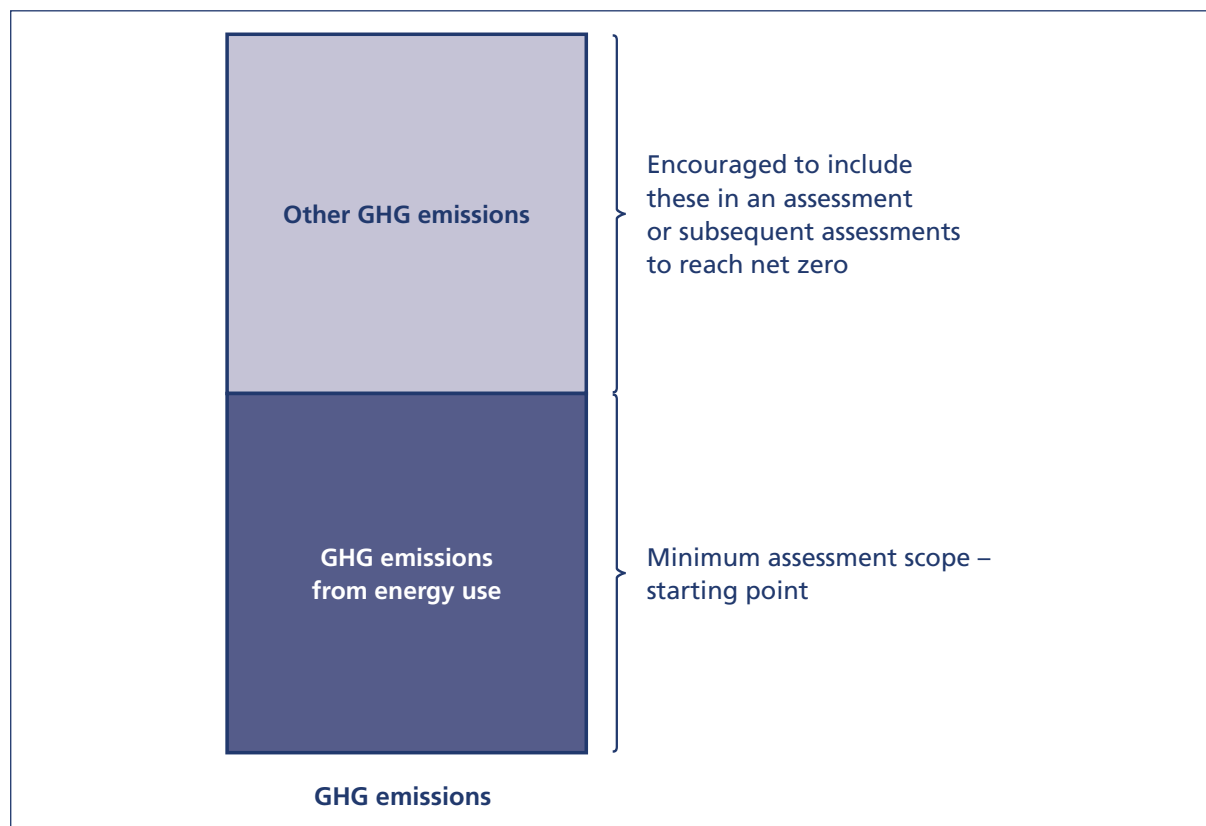
The approach taken to setting the minimum boundary for the GHG emissions that are to be assessed as part of an energy and decarbonization assessment has been to balance the comprehensiveness of emissions coverage with the practical ability of an organization to measure and affect GHG emissions.

For organizations starting out on their energy and decarbonization journey, the initial scope and boundary for the assessment begins with:

- 1) the organization's energy consumption and energy-related Scope 1 and 2 emissions from the organization's assets and activities, including buildings, transport and industrial processes;
- 2) the energy consumption and Scope 3 emissions from business travel; and
- 3) any additional Scope 1, 2 and 3 emissions the organization wishes to include.

Organizations that are being assessed can include other Scope 1, 2 and 3 emissions as part of their energy and decarbonization assessment as shown in Figure 1. While the UN Race to Zero and many other net zero initiatives require organizations to address all their Scope 1, 2 and 3 emissions, it might be beneficial for organizations to focus initially on reducing and decarbonizing emissions that they have the most control and influence over and expand the inclusion of other Scope 3 emissions in subsequent assessments.

Figure 1 – The minimum and additional assessment scopes for the energy and decarbonization assessment



It is important to note that all Scope 1, 2 and 3 emissions need to be addressed in order for an organization to be considered net zero. Organizations and lead assessors are encouraged to enlarge the scope of the assessment to all significant GHG emissions.

NOTE 1 One way to quantify Scope 3 emissions is to assess the carbon footprint of a product and/or a service. PAS 2050 or BS EN ISO 14067 provide these requirements. In the UK, preference is given to PAS 2050.

NOTE 2 An alternative way to quantify Scope 3 emissions is activity-based costing (ABC) – a method that is similar to accounting. This involves the organization obtaining GHG emissions information from its immediate suppliers per unit of product and/or service that the organization procures, working out the organization's own emissions, and calculating the total (the organization's and its suppliers) GHG emissions per unit of product and/or service that the organization sells. Each organization in a supply chain passes on the GHG emissions information to enable the subsequent organizations in the supply chain to add on their GHG emissions. The whole product and/or service chain's GHG emissions are then totalled up by the end-use organization. For the whole supply chain to achieve net zero, each constituent organization need only take action within its own areas to become net zero. See Robert S. Kaplan and Karthik Ramanna, *Accounting for climate change* [15] and case studies at <https://e-liability.institute>.

0.4 What is covered by an energy and decarbonization assessment?

An energy and decarbonization assessment is an assessment of an organization's energy consumption and GHG emissions within the agreed assessment boundary, which identifies, evaluates and prioritizes improvement opportunities to reduce energy consumption and GHG emissions, assesses the risks to meeting net zero, and produces a decarbonization plan.

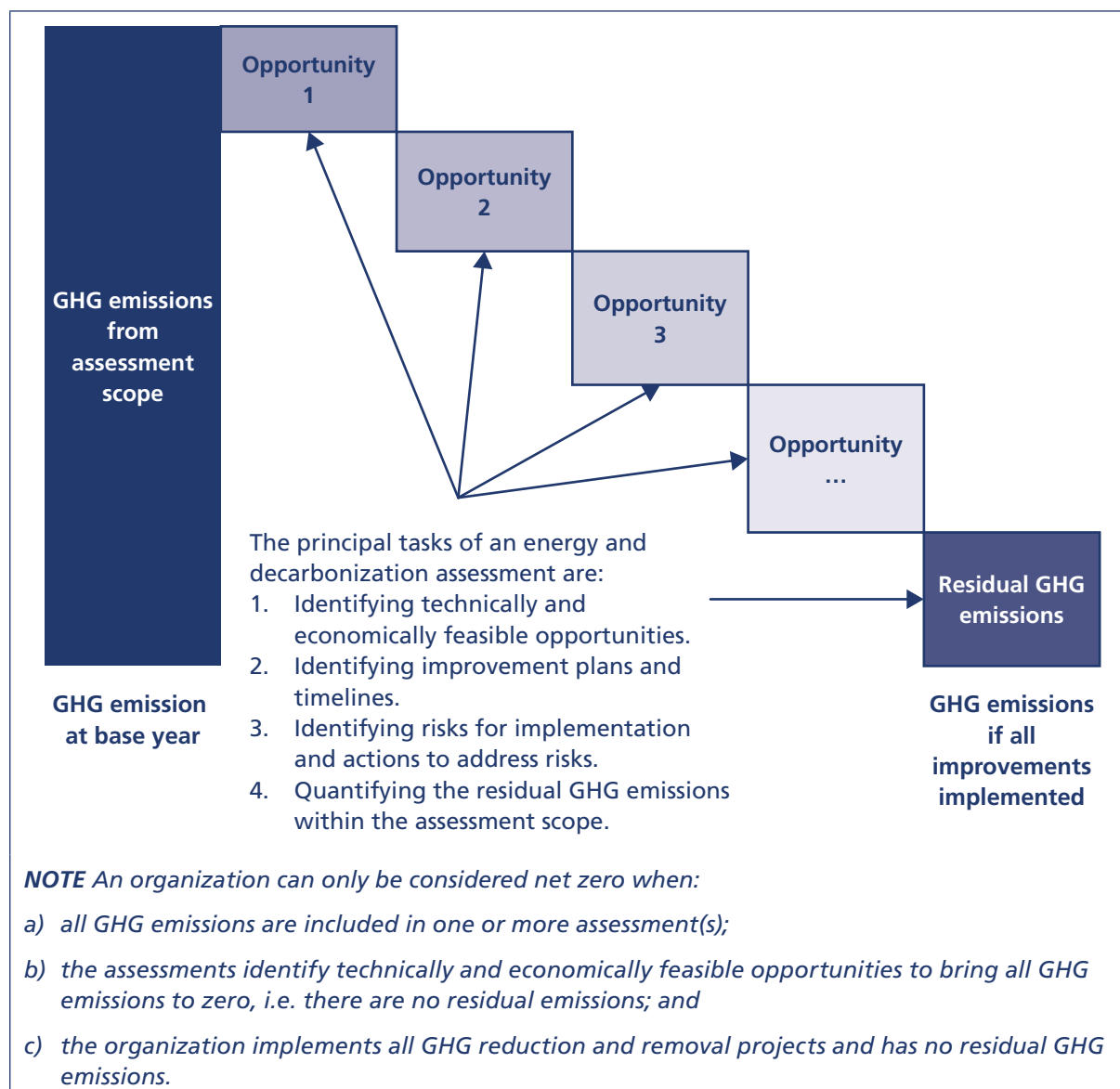
The lead assessor and assessment team gather organizational data and energy and GHG emissions data, which is used to identify the appropriate scope and boundary for the energy and decarbonization assessment, analyse the current energy performance and GHG emissions, assess the current management approach to energy performance and net zero, and identify improvement opportunities.

The assessment takes the approach of identifying what net zero at 2050 or before might look like for the organization and comparing this with the current energy performance and GHG emissions, in order to:

- a) identify the strategic and tactical improvement opportunities to achieve net zero that are within the organization's control and influence;
- b) identify a range of improvement opportunities that prioritize energy performance improvements and minimize GHG generation, before working on opportunities for GHG removals within the boundary of the organization;
- c) highlight opportunities that an organization can take within its boundary without transferring the responsibilities to others outside of the organization;
- d) identify the major risk factors that can hinder the organization from achieving net zero;
- e) highlight the likely costs and financial and non-financial benefits of different approaches to achieving net zero; and
- f) propose an implementation plan with relevant timelines for achieving net zero.

An overall implementation plan for the organization to achieve net zero avoids the risks arising from implementing discrete and disjointed projects or focusing solely on incremental small improvements to existing processes, which might limit or hinder the broader changes needed to achieve net zero by 2050 or before. Figure 2 shows a typical energy and decarbonization assessment output.

Figure 2 – Output of an energy and decarbonization assessment



Over time, additional assessment(s) can be commissioned by the organization being assessed under PAS 51215-1 using the same assessment scope and boundary, in order to update the available options for improvements. Alternatively, additional assessment(s) can be commissioned covering other parts of the organization or additional Scope 1, 2 and 3 emissions, in order to enable the preparation of more comprehensive net zero plans.

0.5 Why conduct an energy and decarbonization assessment?

There can be many motivations for an organization to carry out an energy and decarbonization assessment. An organization might be concerned about current and future costs and how to mitigate them, or it might be interested in attracting clients and employees by building a responsible brand. The organization might be committed to social and environmental goals, or it might want to understand emerging business and investment trends and how it can benefit from them. Stakeholders increasingly require information on organizations' readiness for a low-carbon economy, such as transition plans and climate-related risks and opportunities, so an assessment can provide this insight to investors.

Many new initiatives have been developed both nationally and internationally in recent years to achieve carbon reduction, carbon neutrality and net zero. The momentum towards decarbonization and net zero has grown significantly worldwide and forward-thinking organizations are already taking action. Those organizations which ignore the issue run the risk of being left behind and becoming uncompetitive as net zero becomes part of the normal expectations of society and is increasingly factored into investment decisions.

Conducting an energy and decarbonization assessment can provide a rigorous, transparent and consistent approach for an organization to decarbonize and address net zero objectives. It can enable an organization to identify the most appropriate course of action to follow to meet the challenges of a net zero world, while also signalling engagement with the issues to shareholders, consumers and employees.

Where organizations have not yet engaged in this space, an energy and decarbonization assessment provides a starting point for conversations within the organization and a strategic consideration of energy use in the medium to long term. Where organizations have begun to consider these options but have no formal objectives or plans in place, an energy and decarbonization assessment provides further information to produce a more rigorous programme to decarbonize and achieve net zero objectives.

Large-scale uptake of energy and decarbonization assessments, and implementation of the recommendations by private and public organizations, is crucial to achieving net zero objectives at organizational, local, regional, national and international levels.

The benefits of using the PAS 51215-1 energy and decarbonization assessment are that it allows organizations and lead assessors to:

- a) follow a comprehensive, transparent and consistent approach to conducting an assessment by assessing all of an organization's activities within a defined assessment boundary and scope;
- b) compare proposals and quotations by external service providers to ensure the offerings are comparable;
- c) track the progress of an assessment;
- d) verify that significant opportunities for energy performance improvement and for GHG emissions reductions have been identified and assessed;
- e) be confident that the energy performance improvements and GHG reduction opportunities are based on reasonable calculations, and are relevant and achievable;
- f) produce an overall plan to achieve net zero within the boundary of the assessment, which includes meeting proposed interim targets(s) that are consistent with applicable legal and other requirements;
- g) highlight net zero risks and identify opportunities for improvement that are tailored to the organizational context and minimize operating costs and investments;
- h) use data, calculation, and benchmarking when making decisions on energy performance, GHG emissions, and on-site GHG removals, and when setting organizational targets for continual improvements;
- i) develop a long-term and planned approach towards decarbonization and reaching net zero, through achieving improvements in energy performance and GHG emissions reductions; and
- j) demonstrate corporate responsibility in improving the organization's energy performance and reducing GHG emissions from its activities without shifting the responsibility to others.

Carrying out an energy and decarbonization assessment can also provide a considered and data-driven framework to help organizations working on complementary initiatives such as the UN's Race to Zero and the SBTi's Corporate Net Zero Standard [18]. Compliance with such initiatives is, however, dependent on the boundary of the energy and decarbonization assessment set by the organization, as the minimum coverage of this PAS does not require organizations to assess their full Scope 3 emissions, which is required by these other initiatives.

NOTE Different net zero programmes have different requirements on what needs to be included and the timeframe for achieving net zero. Some examples include:

- 1) *PAS 2060:2014: Includes 100% of Scope 1 and 2 GHG emissions. Total carbon footprint has to cover at least 95% of total GHG emissions. All GHG emissions that are more than 1% are material. PAS 2060:2014 is superseded by BS ISO 14068-1:2023 and will be withdrawn in December 2025;*
- 2) *BS ISO 14068-1:2023: Includes all Scope 1, 2 and 3 GHG emissions that are significant and achieves GHG emission reductions and removals according to a commonly accepted science-based pathway;*
- 3) *UN Race to Zero: Includes all Scope 1, 2 and 3 GHG emissions and achieves at least 50% GHG emissions reduction by 2030 and achieves net zero by 2050 (see <https://unfccc.int/climate-action/race-to-zero-campaign>);*
- 4) *SBTi Net Zero [16]: Includes at least 95% of Scope 1 and 2 GHG emissions and at least 90% of Scope 3 GHG emissions. The organization's chosen base year is no earlier than 2015 and achieves net zero no later than 2050 (see <https://sciencebasedtargets.org/net-zero>); and*
- 5) *PD ISO IWA 42:2022: Includes all Scope 1, 2 and 3 GHG emissions and achieves net zero by 2050. Interim targets are set and reviewed every 2 to 5 years.*

1 Scope

This PAS specifies the process requirements for conducting an energy and decarbonization assessment, as well as the output of such an assessment. The process set out in the PAS includes the identification of opportunities for the organization being assessed to improve energy performance and reduce greenhouse gas (GHG) emissions, and the production of an implementation plan for achieving net zero within the boundary of the assessment.

This PAS covers the process necessary for the assessment of an organization's energy use and GHG emissions. Assessments for which this process is relevant relate to energy use and to GHG emissions for which the organization is responsible and which are covered by:

- a) the organization's energy consumption and energy-related Scope 1 and 2 emissions from the organization's assets and activities, including buildings, transport and industrial processes;
- b) the energy consumption and Scope 3 emissions from business travel; and
- c) any additional Scope 1, 2 and 3 emissions that the organization which is being assessed wishes to include.

NOTE All GHG emissions in c) are at the discretion of the organization being assessed and are to be agreed with the lead assessor prior to the assessment. The assessment boundary (see 7.1) and scope (see 7.4) are defined and documented in an assessment plan (see 7.6).

This PAS does not cover the implementation of recommended improvement opportunities (see 8.10), the environmental disclosures of the organization being assessed, or verification that the organization being assessed has achieved carbon neutrality or net zero status. The PAS also does not cover offsetting residual GHG emissions.

This PAS is applicable to assessors, teams of assessors, and those who lead a team of assessors, who might carry out assessments of an organization's energy and GHG emissions. Such assessors might be internal or external to the organization. It is also of use to organizations of any size that might undertake energy and decarbonization assessments.

This PAS is also relevant to organizations that commission assessments, regulators (national, regional and local), training providers, professional associations, NGOs and academia.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits the application, of this document²⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

PAS 51215-2, *Energy and decarbonization assessment – Part 2: Competencies of lead assessors and assessment teams – Specification*³⁾

²⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

³⁾ Informative reference is also given to PAS 51215-2:2025.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1 Terms related to assessment

3.1.1.1 assessment

systematic analysis and evaluation of energy use, energy consumption, energy efficiency, GHG emissions and GHG removals to identify, quantify and report on the opportunities for improved energy performance and achieve decarbonization

NOTE 1 *An assessment can be carried out using suitably competent in-house expertise or external resources.*

NOTE 2 *The activities of an assessment occur within a defined boundary and scope agreed between the lead assessor and the organization being assessed, Conducting an assessment does not mean that the organization meets all of its legal and other requirements.*

NOTE 3 *The differences between an audit and an assessment are subtle. An assessment is based on the adherence to the outcomes whereas an audit is based on adherence to a procedure and process.*

3.1.1.2 assessment boundary

physical or organizational limits of an assessment

EXAMPLE A process; a group of processes; a site; multiple sites under the control of an organization; or an entire organization, or a group of organizations.

NOTE *The boundary of an energy management system can be different from the boundary of an assessment.*

[BS EN ISO 50001:2018, 3.1.3, modified – the word “assessment” added to the term and “of an assessment” to the definition]

3.1.1.3 assessment objective

intended result and/or end point of the assessment

3.1.1.4 assessment scope

extent of energy uses, GHG emissions, GHG removals, and related activities to be included in an assessment, as defined by the organization in consultation with the lead assessor

NOTE *An assessment scope can include a physical location, functions, activities, processes and transport.*

3.1.2 Terms related to an assessor, lead assessor and technical expert

3.1.2.1 assessment team

one or more people, having a collective knowledge and/or skill appropriate to the assessment scope, who conduct an assessment

NOTE *The knowledge or skill of an assessment team can relate to the technical issues related to buildings, processes, transport, GHG emissions, GHG removal and to non-technical issues such as behavioural and organizational barriers. If the assessment team does not have the necessary technical knowledge and skills, it may be supported by technical experts, as needed.*

3.1.2.2 assessor

person who has the required knowledge and/or skill to conduct an assessment

3.1.2.3 effectiveness

extent to which planned activities are realized and planned results achieved

[SOURCE: BS EN ISO 50001:2018, 3.4.14]

3.1.2.4 lead assessor

person, regardless of their other responsibilities in the assessment team, who plans the assessment, manages the assessment process, and reviews and approves the outcome of an assessment

NOTE *Where an assessment team is comprised of a single person, that person also assumes the responsibilities of a lead assessor.*

3.1.2.5 technical expert

person who provides specific knowledge and/or skill to the assessment team

NOTE *Specific knowledge can relate to the organization, its business processes, energy performance improvements, GHG emissions and GHG removal.*

3.1.3 Terms related to energy and energy performance

3.1.3.1 energy source

type of energy that is procured, converted, and consumed by the organization

NOTE 1 *Energy source refers to the various types of energy, including renewable, which can be purchased, stored, treated, used in equipment or a process, or recovered.*

EXAMPLE Electricity, fuels, steam, heat, cooling, compressed air, and other sources.

NOTE 2 *Energy sources can be primary (extracted or captured directly from natural resources such as crude oil, hard coal, natural gas, or are produced from primary commodities such as solar or wind) or secondary (after the transformation of primary energy, such as electricity, heat, etc.).*

3.1.3.2 energy consumption

quantity of energy applied

NOTE *Energy consumption can be represented in volume (e.g. litres of fuel), mass, weight units or energy units (e.g. GJ, kWh).*

[SOURCE: BS EN ISO 50001:2018, 3.5.2]

3.1.3.3 energy efficiency

ratio or other quantitative relationship between an output of performance, service, goods, commodities, or energy, and an input of energy

EXAMPLE Conversion efficiency; the energy required/energy consumed.

NOTE *Both input and output are to be clearly specified in terms of quantity and quality, and are to be measurable.*

[SOURCE: BS EN ISO 50001:2018, 3.5.3, modified]

3.1.3.4 energy performance

measurable results related to energy efficiency, energy use and energy consumption for a defined period

NOTE *Energy performance refers to the reduction of energy demand and is independent of the types or sources of energy supply to the organization.*

[SOURCE: BS EN ISO 50001:2018, 3.4.3, modified – notes replaced]

3.1.3.5 energy use

application of energy

NOTE 1 This concept is based on “what the energy is used for” as compared to the energy consumption, which is based on “how much energy is used”.

NOTE 2 Annex C gives further examples of energy uses in buildings, transport and industrial processes.

[SOURCE: BS EN ISO 50001:2018, 3.5.4, modified – example deleted, note modified, and new note added]

3.1.4 Terms related to greenhouse gases

3.1.4.1 carbon dioxide equivalent (CO₂e)

common unit for comparing the emissions and removals of carbon dioxide and other GHGs

NOTE The carbon dioxide equivalent is calculated by multiplying the activity by the appropriate emissions factor. Attention is drawn to the UK’s GHG factors at <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>.

3.1.4.2 emissions factor/conversion factor

quantitative relationship between an organization’s process and its GHG emissions and/or GHG removals

3.1.4.3 GHG emission

release of a GHG into the atmosphere

NOTE In this PAS, the following GHG gases are of concern: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

[SOURCE: BS EN ISO 14064-1:2019, 3.1.5, modified – admitted term removed]

3.1.4.4 GHG removal

withdrawal of a greenhouse gas (GHG) from the atmosphere

NOTE 1 Methods of GHG removal include afforestation, bioenergy with carbon capture and storage (BECCS), direct air capture and storage (DACCS), and marine fertilization within the assessment boundary. The risks posed by the longevity and permanence of the GHG removal are considered during the assessment.

NOTE 2 GHG removal can be carried out by the organization at the source of GHG emission, elsewhere within the organization’s boundary, or carried out independently by others outside the control and influence of the organization.

[SOURCE: BS EN ISO 14064-1:2019, 3.1.6, modified – admitted term removed and “by GHG sinks” removed from definition]

3.1.4.5 GHG source

process that releases a GHG into the atmosphere

3.1.4.6 greenhouse gas (GHG)

gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth’s surface, the atmosphere, and clouds

NOTE Water vapour and ozone are anthropogenic as well as natural GHGs, but are not included as recognized GHGs due to difficulties, in most cases, in isolating the human-induced component of global warming attributable to their presence in the atmosphere.

[SOURCE: BS EN ISO 14064-1:2019, 3.1.1, modified – Note 1 replaced]