Environmental Management Briefing - DRAFT IEMA GUIDANCE 2018

Driving climate action through Environmental Management Systems

1 Outline

In 2015, ISO 14001, the world's leading environmental management system (EMS) standard - was substantially revised. The purpose of the revised standard is to *"Provide organizations with a framework to protect the environment and respond to changing environmental conditions in balance with socio-economic needs."*

The revised standard makes clearer reference to the two-way relationship between organisations and the environment, i.e. *the organisation shall consider environmental conditions being affected by or capable of affecting the organisation* (ISO 14001:2015 clause 4.1). It therefore continues the requirement for organisations to address their impacts on the environment, including their contribution to climate change, but also now introduces the importance of resilience and adapting to our changing world (e.g. impacts on the organisation from the changing climate). This combination of stewardship responsibility along with organisational response and resilience, is a principal that can be increasingly integrated into organisational management systems (not just EMS).

In addressing climate change, organisations have two primary approaches of mitigation and adaptation to work through and which should be integrated within the context of a formalised Environmental Management System (EMS).

- Climate Change Mitigation – actions to reduce carbon and wider GHG emissions, or to enhance GHG removals; i.e. tackling the causes of climate change such as fossil fuel combustion, energy inefficiency, fugitive emissions (F-gas leakage), travel and transportation, embodied carbon and 'delayed emissions'. Also emissions from land use / land use change like deforestation (or for GHG removals, restoring peatland and new woodland creation).
- Climate Change Adaptation– adjusting natural or human systems (including organisations) in response to actual or expected climatic stimuli or their effects, and in doing so to moderate harm or exploit beneficial opportunities.

These approaches provide multiple opportunities for action on Climate Change and are explored throughout this guidance, within its following review of example EMS clauses. Both mitigation and adaptation are essential and through these complementing approaches, organisations will improve short-term and longer-term performance and resilience.

The direct and indirect effects of climate change upon organisations are becoming more discernible year by year, ranging from carbon taxation through to severe weather impacts. It is imperative that organisations start to address these impacts on their activities strategically and operationally. Many organisations have a form of EMS, whether based on ISO14001 or not. Such systems form a business ready opportunity to start, renew or continue their journey towards climate action.

2. The objective of this Guidance

This guidance provides information on the opportunities to use an EMS to address issues related to climate change as relevant to your organisation. It is largely based around the requirements of ISO 14001:2015 but is also relevant to organisations that use other standards or approaches.

This guidance has been compiled primarily for environment and sustainability professionals. The intended audience is anyone working with or considering developing an EMS and with managerial or operational influence over the EMS. For example, managers, auditors or departmental representatives within an EMS team. It will also interest owners and directors, facilities, financial

and energy managers or those with combined roles such as for safety, health and quality including auditors. The guide is intended to be read as a supplement to EMS standards (not a replacement).

3. Opportunities to address Climate Change in your EMS

Climate change is increasingly recognised as a material business consideration. The scientific consensus and projections are overwhelming, and a step change is required if we are to meet necessary reduction targets for avoiding dangerous climate change.

Scientists are confident that human activities (such as burning fossil fuels, deforestation and agriculture) are the primary factors driving climate change. Irrespective of the responsibility, organisations are facing climate change impacts and escalating policies (e.g. carbon taxes or renewables incentives) to drive reduced emissions. In the economic context, the focus is moving for organisations into 'business realities' such as: reducing energy consumption (and costs), complying with climate legislation, improving performance, increasing business resilience, building corporate reputation and meeting contractual and stakeholder expectations.

4. What is the business case for Climate Action?

Drivers for corporate action on climate change broadly fall into categories of Financial, Legal, Reputational and Moral (values) and include;

1. Efficiency and cost savings (the bottom line).
2. Addressing stakeholder expectations.
3. Competitive advantage - improve reputation, market differentiation and increase brand loyalty, winning new work and increasing sales.
4. Maintain compliance with increasing local, national and international requirements.
5. Identify climate related risks and promote business resilience.
6. Support climate related opportunities for innovation and business growth.
7. Attract, motivate and retain the best staff and promote employee engagement.
8. Reputational benefits (communicating and demonstrating values / morals).

5. ISO 14001 as a tool to address climate change

Organisations that want to compete in the globalised market need to ensure that planning for and responding to our changing climate is embedded into their business strategy. ISO 14001:2015 provides a management framework that can be used as the mechanism to drive forward Climate Action, following the Plan-Do-Check-Act model. Changes include;

- Requiring the organisation to consider the wider context of the organisation and expectations of interested parties
- Enhanced focus on leadership
- Embedding a lifecycle perspective across the value chain
- The requirement to analyse the risks and opportunities and to consider the potential impacts of changing environmental conditions (such as resource security and climate change) on business strategy and operations.

6: Guidance on integrating climate actions into your EMS – Review of EMS Clauses

The following sections provide advice on integrating climate change considerations and actions into an EMS. This guidance can also inform approaches to climate action within wider management systems. Numbered references in brackets **(X.Y)** are indicating relevance to ISO14001.

The tables present indicative EMS clauses (deriving from ISO 14001) and outline how these can be used as a basis for supporting action on climate change and climate risks. Some examples and information sources are referenced (with links). Further sources of supporting guidance and information for use alongside this briefing is provided in the Annex.

EMS clauses on Strategic Context

Understand the organization and its context (4.1)	**Climate Change considerations / opportunities**
Determine relevant internal and external issues that may affect the EMS outcomes, including environmental conditions affected/ affecting organization. The organisation should focus on the most important or material issues, risks and opportunities to the organisation and to the EMS and its outcomes. This is an opportunity to consider strategic and longer-term risks and opportunities	A requirement introduced to the 2015 version of ISO14001, this presents an opportunity to consider longer term risks, opportunities and dependencies (see also 6.1.1). It introduces a requirement for organisations to consider a 'two-way relationship with the environment'. I.e. no longer focused just on the many ways an organisation might impact the environment, but also how the environment might impact on the organisation. Climate change is a prime opportunity concerning this interaction. Addressing this clause may help you gain greater insight into external factors that could positively or negatively affect your business, increase the resilience of your operations and supply-chain, operate within the boundaries of the natural systems upon which we all depend and consider the design of new products and services. For instance, organisations may complete a PESTLE (Political, Economic, Sociological, Technological, Legal & Environmental factors) analysis, or similar with senior management**.** Seek to run this process across the business, rather than being solely the responsibility of one team. Give thought to techniques such as back-casting as well as future scanning**.** You might like to consider: 1) How might your internal context affect the success of the climate related features of your EMS (e.g. carbon reduction targets)? 2) How might your external context affect your ability to achieve the EMS purpose and goals (e.g. Changes to Legislation, Climate and weather impacts)**.** Are you part of a supply chain, or sector with climate change commitments or dependencies? 3) Look at what your competitors and peers are doing in relation to climate change commitments. 4) Consider opportunities as well as risks.
Many wider initiatives and sources can help to develop an understanding of the strategic context facing the organisation. Specific evaluation is often required and localised, regional, regulator, Local Authority and sector-based sources can all be informative. Some further examples and sources (mainly UK based) include understanding Natural Capital dependencies, longer term scenario analysis through the work of the Task Force on Climate Related Financial Disclosure (TCFD), understanding climate impacts, preparedness and risk through reports under the UK Adaptation Reporting Power and wider analysis from the UK Committee on Climate Change	

Considerations on organisational context – Climate Change Mitigation (examples)

- Energy scarcity, reliance and dependency can be important to the organisation. Diversification and on-site generation may yield some benefits to address risks.
- Carbon and GHG emission control and reduction may be increasingly required under future legislation, taxation, or from key client requirements or investors.
- If the business is 'carbon intensive' there will be a future (transition) risk as society decarbonises and carbon pricing extends. There may be opportunities to diversify or change the business model or some of its operations. This could yield a comparative advantage against competitors.
- Demand for products and services will increasingly be impacted by climate change societal trends. This can affect the organisation's critical purchases and supply chain, sales and future revenue. This is both an area of risk and a potential opportunity. For example --

  Deutsche Post DHL is now developing and managing its own electric delivery vehicles, called "StreetScooters". In its role as a forerunner in climate-efficient green logistics, it recently reported it had deployed 5,500 StreetScooter electric delivery vehicles in its mail and parcel operations (*reference: Dedicated to Shared Values – Corporate Responsibility Report 2017).*

Considerations on organisational context – Climate Change Adaptation

- Is the organisation's operation, business model or EMS vulnerable to impacts such as flooding, heatwaves or extreme weather? This may, through the supply chain, include climate change impacts overseas.
- Do changes in the climate and weather create opportunities for the organisation's core business or to the EMS objectives?
- Are there sector specific considerations - e.g. organisations in the Food and Drink sector may have identified a risk to the availability and/or price of raw materials (e.g. as temperatures increase, precipitation patterns change, diseases increase in range). For example -

  ASDA (part of the Walmart Group) recently reported that 95% of its fresh produce range is at risk from climate change, thereby identifying climate change as a key issue for its business.

Further sources of help

- For Climate Change Adaptation, consider using approaches such as BACLIAT or the Wizard Tool (UKCIP) to help analyse opportunities and threats from the changing climate. Also forthcoming new International Standard ISO14090 (framework standard on climate change adaptation).
- Recent outputs from the Task Force on Climate related Financial Disclosure (TCFD) may be helpful on longer term strategic risks (transition risks, financial and reputational risk, policy, legal and litigation risks). It also includes technique for scenario analysis.
- The Climate Disclosure Standards Board and the Natural Capital Protocol have both developed useful strategic guidance and frameworks that can support evaluation of materiality and the strategic context of the organisation.

Understanding needs and expectations of interested parties (4.2)	Climate Change considerations / opportunities
Determine the needs and expectations of interested parties from an environmental perspective.	This clause presents an opportunity to integrate Climate Change concerns into your stakeholder needs analysis and feed these into your business strategy. Some expectations can be extended into compliance requirements (6.1.3). Techniques such as stakeholder mapping approaches can be helpful. This is also an opportunity to trial new collaborative approaches. Many sustainability challenges are recognised as 'too large' to resolve in isolation. Collaborations can be enabled, evolving from engagement with interested parties.

<u>Interested parties – Climate Change Mitigation;</u>

- Customers - Concerned about environmental credentials and impacts of products and services.
- Clients – Some will request organisations in their supply chain to report on and manage their energy / carbon footprint (can appear in tenders or in Pre-Qualification phases).
- Employees - The sustainability strategy of an organisation is increasingly recognised as a factor that influences employees and in attracting skilled graduates (i.e. seeking progressive employers that are perceived to be ethical and socially responsible).
- Government – Can require certain organisations to report on their GHG emissions or set expectations such as adaptation reporting.
- Investors are seeking information (e.g. though disclosure schemes such as CDP).
- Trade and sector bodies can be interested and supportive parties.

<u>Interested parties – Climate Change Adaptation;</u>

- Customers and clients – Interested in the resilience, continuity and quality of products and service provision and how these can be vulnerable (e.g. supply chains or directly).
- Local organisations and neighbours - facing similar climate impacts (can provide opportunities to collaborate)
- Government – Requesting some organisations to report on their adaptation and resilience to climate risks (i.e. through the UK Adaptation Reporting Power).
- Insurance industry is increasingly paying for claims linked to erratic weather. Investors and insurance companies are assessing the level of commitment to sustainability and level of exposure to climate risk (e.g. flooding or storm damage) of companies in their portfolio.

Determining the scope of the EMS (4.3)	Climate Change considerations / opportunities
Establish the boundaries of the EMS, taking into account context, control and influence, lifecycle thinking and the longer-term nature of climate impacts.	- Consider where you have control and influence (also will be considered in the aspects analysis in 6.1.2). - Consider setting the scope so that longer term considerations from changing climate (threats and benefits) can be addressed. - Organisations may address this clause by completing a mapping exercise of the business activities (e.g. process flow charts). This also provides an opportunity to take a life cycle perspective and other supportive approaches (e.g. systems thinking).

Considerations on determining the Scope - Climate Change Mitigation

- Ensure that 'hot spots' of GHG emissions are included (do not narrowly or unreasonably limit the EMS scope to exclude high impact units or functions). This is for example, an opportunity to consider where materials are sourced and the carbon impact of transport.
- Consider extending the scope to include elements of the life cycle that you can control or influence (e.g. working with your supply chain, influencing tenders and suppliers and procurement).

Considerations on determining the scope - Climate Change Adaptation

- When deciding boundaries of the EMS, consider which business units or locations may be at a greater risk from climate impacts.
- Consider the supply chain and key dependencies for the organisation (e.g. positive scoping in of the supply chain and commencing EMS influence of important and developing risks).

Environmental Management System (4.4)	**Climate Change Considerations / Opportunities**
Establish, implement, maintain and continually improve an EMS, including the processes needed and their interactions.	Consider how you might be able to integrate the EMS and climate related considerations into various business processes such as design, development, procurement, human resources, finance, sales and marketing etc. Internal stakeholder mapping can be undertaken to understand the scope for improvement, prioritising the focus for internal liaison and subsequent business case development. Seek improvements to internal processes that inform decision making and improvement opportunities in the medium and longer term (e.g. revised financial evaluations and processes for Returns On Investment – ROI) .

EMS Clauses on Leadership

Leadership and commitment (5.1)	**Climate Change Considerations / Opportunities**
Top management must demonstrate leadership and commitment with respect to the EMS. ISO14001 outlines nine specifics under leadership and commitment Including link to business strategy, integration and accountability	An important consideration in this clause is the potential for building EMS policy and objectives that are compatible with the strategic direction and context of the organization. This is a 'two-way' opportunity where the EMS can also influence the organisational strategy (mainstreaming climate commitments into overall strategy and business processes). The opportunities vary relative to context, but examples could include; - Establishing new roles and accountability (including board level). - Consider a high-level advisory panel with 'critical friends'. - Potential for communication of a specific climate change related target or vision for the organisation. - Other public commitments (such as within a sector or in wider public collaborations). - Establishing and using processes such as internal reporting or public disclosure. - Mainstreaming improvements (e.g. training for employees and performance pay for directors on their climate targets).

	This clause provides the opportunity to engage at a senior level (e.g. CEO, Board of Directors, Managing Directors and Business owners). Workshops, executive training or roundtables as an opportunity to influence (and integrate with) corporate objectives, strategy, business plans, risk registers, vision statement, business resilience and continuity plans. Corporate leaders attended COP 21 in Paris and leadership from business and civic society was instrumental in building the momentum for international climate change agreements. Potential will vary with context[1].

Leadership and Commitment examples - Climate Change Mitigation

- Catalyse internal review and evaluate the potential for new business models.
- Review collaborations within your sector and the opportunity to engage or to lead.
- Review key client and investor aspirations and look at how these could be supported
- Consider building in a carbon reduction target commitment within the mainstream strategy (e.g. Unilever has taken this approach).
- Consider public commitments – e.g. RE100, Science based targets, Net Positive, Carbon Neutrality (or other commitments achieved by target date).
- Annual GHG public reporting or wider disclosure commitments such as the Task Force on Climate Related Financial Disclosure (TCFD).
- Seek to align sustainability within the commercial benefits of work, services, products and projects and with a clear focus on business benefit.
- Consider innovative approaches such as introducing an internal carbon price or longer-term approaches to financial return on investment (ROI).
- Consider skills and competence across organisation and how to engage top management (e.g. Climate Change Master Class for your Board or senior leadership team).
- Consider signing up to voluntary initiatives such as The United Nations Global Compact, United Nations Sustainable Development Goal (SDG) 13 Climate Action.

Leadership and Commitment examples - Climate Change Adaptation

- Opportunity to demonstrate leadership by integrating climate impacts into Corporate Risk Registers, business resilience processes, disaster recovery and business continuity plans. This area is highly developmental. For many reasons (e.g. lack of a system wide view, low awareness, high thresholds concerning materiality) few Corporate Risk Registers are factoring in climate impacts. This needs to change.
- Potential to engage in public awareness by reporting and disclosure of proactive commitment to be climate resilient and well adapted (e.g. future-fit).
- Making commitments to trial and support the development of new guidance and standards within this emerging field.
- Willingness to experiment with pilot schemes, trials, contingencies (e.g. new supply chain arrangements or with employee flexible working).
- Collaboration with other businesses locally regarding direct climate impacts and more widely with suppliers, partners and the industry sector.

[1] For guidance on change management relative to your organisation and your own remit -read IEMA sustainability in Practice Guide Vol 1– Change Management for Sustainable Development (2017) - Free for IEMA members.

Environmental Policy (5.2)	Climate Change Considerations / Opportunities
Establish an environmental policy and will include commitments such as; i) Fulfil compliance obligations, ii) Protection of the environment including pollution prevention iii) Continual improvement Communicate internally and make available to interested parties.	The policy needs to be 'business-relevant' and tailored to the organisation. Ensure climate change mitigation and adaptation are incorporated into your Sustainability/Environmental Policy and where possible referenced in organisations wider strategy/policy. Within the 2015 revised ISO14001, a reference to 'protection of the environment' provides additional opportunity to address climate change mitigation. With regard to science-based consensus and extensive IPCC evidence on atmospheric GHG emissions and scenarios, climate change is clearly now an accepted prime issue for urgent environmental protection. Communication considerations concerning climate change, include the need to consider audiences and their motivations. Many sustainability professionals are now communicating both mitigation and adaptation commitments within well-tailored programmes to engage stakeholders in climate action

<u>Climate Change Mitigation – Some policy examples</u>

- To minimise and efficiently manage the organisation's consumption of fuel and energy
- To apply the IEMA GHG Management hierarchy, in particular to maximise energy efficiency and use of low carbon technology (related example policies may be) -
    - ~ To develop a structured programme to reduce carbon emissions from our operations and supply chain
    - ~ Measure and reduce our carbon emissions and offset remaining emissions to become carbon neutral by a specified date
    - ~ Increase and sustain our electricity consumption from credibly certified renewable energy generation sources
- To promote sustainable travel and actively promote and encourage the use of telephone and video conferencing where practicable

<u>Climate Change Adaptation – policy examples</u>

- To understand and assess the main risks to the organisation from climate change as well as any opportunities
- To adapt services, making them more resilient to the predicted impacts of climate change, and support external partners and communities to become more resilient
- To ensure the wellbeing of our employees and the safety and resilience of our operations (also with regard to the needs of our customers and other stakeholders)
- To make our operations resilient to weather impacts and future changes in the climate

Organizational Roles, Responsibilities and Authorities (5.3)	Climate Change Considerations / Opportunities
Assign responsibilities for environmental management including reporting on performance This clause presents the opportunity to consider the range of personnel in the organisation that have ability to influence your climate change strategy or a role to play in the success of your climate goals.	A core EMS team is needed and it can be beneficial if this has wide involvement (e.g. with departmental representatives, champions or both). A Board level champion is valuable as is building in reporting to top management Relevant contributing roles from existing structures, may include facilities, maintenance, environment manager, sustainability manager, SHE, civil contingencies and emergency planning, corporate risk, business continuity, quality, health and safety, accounting, audit and Human Resources (HR). Although nearly all roles in an organisation can contribute and be relevant (depending upon context), do avoid excessively large teams. Efficient embedding around existing structures can be effective and more durable as an EMS resource structure. The finance director is often instrumental and can be an ally in relation to energy management and cost efficiencies. Risk and business continuity professionals can be important in supporting adaptation, Marketing in relation to innovations around services and products, HR in relation to training and communications for building profile and enhancing corporate reputation through the EMS.

<u>Example roles and responsibilities - Climate Change Mitigation</u>

- Director level with overall responsibility (required under the CRC scheme and in some cases is set voluntarily within the Board - i.e. champion / sponsor).
- Responsibility for reporting on the GHG performance of the organisation. This may include compliance with legislative requirements (e.g. UK mandatory GHG reporting).
- Responsibility for Energy management and energy audits (e.g. ESOS).
- Responsibility for reporting to external initiatives such as CDP or GRI.
- Responsibility for internal reporting (e.g. energy performance, management review).
- Connected roles in Facilities management and compliance (e.g. F-Gas).
- Roles regarding sustainable procurement, business travel waste and management.
- EMS team roles (across departments and functions).
- More specific references – e.g. verification of energy savings, claiming of ECA, R&D/Innovation, analysing data sources (telemetry, energy, fuel data etc).
- Broader references added to mainstream job descriptions.

<u>Potential roles and example responsibilities - Climate Change Adaptation</u>

- Corporate risk and roles regarding business resilience and continuity plans.
- HSE roles and HR Department for staff welfare and travel / remote working.
- Review existing responsibilities - consider where Adaptation may be integrated.
- Short term impacts may be added to some risk, emergency preparedness and planning roles.
- Assign role for assessing medium term impacts, risks, resilience and adaptation options.
- Director responsible for Risk Register and longer-term risks (dependencies and adaptation).

The following table from IEMA guidance on the Adaptation Business Case (2013) provides an indicative overview of roles that IEMA members may undertake on Climate Change Adaptation.

TYPICAL PRACTITIONER ROLE AND COMPANY	DECISION MAKING & INFLUENCE OPPORTUNITIES (EXAMPLES)	PROGRESS ACHIEVED IN THE BUSINESS (EXAMPLES)
HEAD OF SUSTAINABILITY OR ENVIRONMENT FOR A LARGE COMPANY (e.g. a multi-site complex corporate)	- Corporate sustainability strategy, EMS, audits and internal working groups - Updates to risk register (contributory) - Others' business planning (influence) - Investments / projects (influence) - purchasing and supply - Stakeholder advisory groups - Communications and annual reports	- Material climate risks mitigated and monitored (via risk register) -Supply chain resilience (e.g. diverse source, local supply, efficiencies) - Headline sustainability initiatives at key sites (adaptation part of rationale) - Commitment and progress reported - Sharing best practice across divisions or Subsidiaries in the wider Group.
ENVIRONMENT MANAGER OR OFFICER WITHIN A MEDIUM TO LARGE BUSINESS (a 'threshold' business supplying in to others - some complexity)	- EMS procedures, audit & continuous improvement process (e.g.ISO14001) - Addressing client requirements as part of the supply chain (support others) - Multi-team groups / green champions - Risk & business continuity (generally less than within larger corporates but scope for input) - Other requirements (e.g. regulator) - Purchasing (support others / trials)	- Flood risk assessments across critical business units / sites - On site measures to increase resilience and continuity (e.g. flood protection, diversified supply and efficiency) - Trial schemes and approaches - Climate change risks managed within the EMS (e.g. in aspects register and with specific procedures)
CONSULTANT OR ADVISOR IN BUSINESS FOCUSED ON SERVICES TO CLIENTS (specialist or physical services)	- Main opportunities are in addressing PQQ bid requirements and building CCA in proposals to clients - Internally EMS, risk and business continuity approaches provide some scope	- Increased income from specialist services related to climate change adaptation - Some examples of re-focusing on climate change services as core business model

Planning

Actions to address risks and opportunities (6.1)	Climate Change Considerations / Opportunities
Determine risks and opportunities related to: i) Environmental aspects, ii) Compliance obligations, iii) Context analysis, iv) Interested parties.	Consider climate related risks and opportunities referring to the analysis conducted in 4.1 (and addressed further in 6.1.2) and the needs and expectations of interested parties (4.2) as well as compliance obligations (6.1.3.). If your organisation has an existing approach or processes to manage risks, then consider integrating and embedding within / alongside those systems.

The organisation's Corporate Risk Register can be a starting point. However, Climate Risk may be challenging to integrate in these registers and alternative and complementary approaches may be needed. Framing a high-level horizon scanning exercise, with a focus on opportunity (as well as risk) may be one way forward. Opportunities for example, may include new markets and the potential to secure climate finance or explore new business models through partnerships. Natural Capital approaches can allow for a broader framing in high-level reviews and may provide a way forward. Some reporting schemes (e.g. CDP) require a risk and opportunities register, prompting the organisation to consider the following six scenarios relating to Climate Risk.

- risks driven by changes in regulation (e.g. carbon taxes).
- risks that are driven by change in physical climate parameters.
- risks that are driven by changes in other climate-related developments.
- Opportunities driven by changes in regulation.
- Opportunities driven by changes in physical climate parameters.
- Opportunities driven by changes in other climate-related developments.

Transition risk to the organisation or business model (e.g. its commercial failing or disadvantage within a future low carbon economy) is a growing area of planning and scenario analysis. Guidance is developing in relation to this and work of the Taskforce on Climate Related Financial Disclosure.

Further examples in Climate Change Adaptation - Risks and opportunities arise from;

Change in precipitation pattern	Increased snow and ice
Change in precipitation extremes	Tropical cyclones (hurricanes and typhoons)
Flooding	Sea level rise
Coastal erosion;	Change in mean (average) temperature
Disruption of transport and communication	Reduced availability of natural resources
Droughts	Impacts on crop yields
Heatwaves and health effects	Water scarcity
Increased range of diseases	Resource scarcity
Forest fires	Reliability of energy supply

Many of these can pose risks, particularly for activities with extensive assets or with complex supply chains or which rely substantially on natural assets. Opportunities also exist including;

- Increased availability of some natural resources.
- Exploitation of the changing world (e.g changes to the growing season and changing weather allowing for new crops, new shipping lanes across the Arctic).

The following table from IEMA guidance on the Adaptation Business Case (2013) is an indicative overview of example Climate Adaptation related risks and dependencies.

BUSINESS RELEVANCE	CLIMATE DEPENDENCY FOR THE BUSINESS (mostly seen as risk)	RESPONSE EXAMPLES (direct or comparative opportunities)
PROFITS (direct or near term)	- Disruption of operations on site (flood, frost, etc) - Weather disruption of both supplies in and also deliveries out to clients (UK + overseas) - Customers not able to access goods (weather events) - Staff not able to get to work (weather events) - Scarcity & impact on cost of materials, water, energy. - Weather disruption to electricity/fuel supply - Increased insurance costs / access to insurance	- Onsite measures (flood defense, SUDS, reducing water ingress, building design, modifications) - Diversified supply chain (build resilience) - Changes to procurement (contracts, suppliers) - Increased stock holding and/or contingencies - Onsite energy generation (option to include low carbon energy, receive ROCs, sell surplus to grid) - Critical workers policy (remote), and providing flexible work-life balance solutions for staff - Meeting insurer requirements – maintain cover
WINNING BUSINESS (& keeping business)	- Contracted service level requirements on continuous delivery (irrespective of weather) - Client expectations (e.g. seeking adaptation evidence via PQQs and specifications) - Increased demand in climate related services and expertise (flood assessments, specialist design, etc)	- Opportunity for business advantage through increased resilience / business continuity. Refocus business on opportunities (e.g. direct in new products & services or indirect resilience) - Increase capacity on climate change work (expertise & skills) - Add value for clients (e.g. through creative bids addressing CCA)
REQUIREMENTS (regulators / others)	- Requirements for flood risk assessments & mitigation (planning process, Environment Agency, others) - Increasing contractual requirements from key clients (e.g. Corporate supply chain, Govt & public sector) - Policy and legislation. Currently easing off with removal of National indicators (NIs) and also CCA reporting requirements changing (to voluntary)	- Avoiding delay on consents, helping to ensure business continuity - Business imperative to meet contracts / and opportunity to exceed minimum requirements - Opportunity to build on impetus from the initial reports - NIs (Local Authorities) and CCRA reports (utilities / others)
CORPORATE REPUTATION (& stakeholder expectations)	- Damage to reputation (e.g. media stories on company failure following weather or climate disruption) - Longer term reputation effecting profitability or ability to secure consents and investment - Expectations from key stakeholders, clients and investors (also some corporates have sustainability advisory panels providing 'critical friend' scrutiny)	- Good news stories on local stewardship of environment (UK or overseas) - Reporting on positive climate adaptation approach (in company or sustainability report) - Report to shareholders and institutional investors that risks have been identified and mitigated can help 'leading company' status' support access to finance and inward investment.
LONGER TERM VALUE	- Existing estate/asset value affected by climate change (e.g. reduced value / potential of sites that will be at increased future risk) - Acquisitions of other businesses and capital need to factor longer term risk (long term climate projections) - May impact regulator views in future (e.g. whether the site is safe to operate if it poses a pollution risk)	- Proactive flood and climate risk assessments - Targeted measures on risks - Incorporate and address climate change risk within due diligence processes - Opportunity to demonstrate preparedness and achieve recognition - 'license to operate'

Environmental Aspects (6.1.2)	Climate Change Considerations / Opportunities
Determine the environmental aspects (taking a life-cycle approach) and evaluate for significance.	This clause relates to activities, products and services and not just those directly controlled – also those that can be influenced. Furthermore, reference is made to considering a life-cycle perspective. In this context environmental aspects should be viewed broadly. The requirement to develop criteria on (significant) aspects provides a positive opportunity for embedding and extending action on Climate Risk. Environmental aspects for climate change can include a mixture of direct and indirect impacts, be positive or negative and be as a consequence of the risks or opportunities identified in 6.1.1.

Environmental Aspects - Climate Change Mitigation

Examples include direct or indirect GHG emissions (and in some cases GHG removals) from the following activities, products and services;

- Direct energy use such as fuels consumed on sites, buildings, plant and equipment and in vehicles.
- The use and release (escape) of fluorinated industrial gases[2] (e.g. from damaged air conditioning or refrigeration equipment).
- Emissions from industrial processes (e.g. cement manufacture, lime, glass etc).
- Land use and land use change (e.g. woodland removal, woodland creation, peatland restoration and some land management practices).
- Carbon capture (either technical process opportunity or nature-based processes).
- Indirect energy use such as electricity consumption (scope 2 emissions that occur offsite / at the point of energy production).
- GHG emissions across the wider supply and value chains and within products and materials and services. This also includes customer use of products or services, along with:

- Water consumption.
- Waste disposal.
- Purchasing and resource consumption.
- Packaging and its carbon footprint.
- Material choice and embodied carbon (certain materials are more energy intensive).

Environmental Aspects - Climate Change Adaptation – examples include

- Impacts from increased extreme weather and climate change (e.g. flooding of premises/damage to materials in storage areas, wind damage to buildings and property etc).
- Materials, goods and industrial processes may be sensitive to temperature and weather.
- Employees or customers may be affected by extreme weather and changing climate (e.g. staff may not be able to reach work, supply of materials may be disrupted and distribution of your product or service could be delayed). Customer expectations for products and services may be affected by extreme weather and changing climate.

[2] A case study and template / example spreadsheet for F-Gas has been provided on iema.net - https://www.iema.net/policy/climate-change-and-energy/case-study-f-gas-register

Compliance (6.1.3)	Climate Change Considerations / Opportunities
Determine environmental compliance obligations and how these apply to the organization.	Relevant climate change related compliance obligations may originate from your review of the needs and expectations of interested parties (4.2) or an analysis of legislation and other requirements (e.g. voluntary codes of conduct) that relate to your operation and aspects (6.1.2). This guidance and separate supporting information does not aim to provide a tailored or exhaustive list of potential compliance requirements. You should consult a number of sources and review both legal and wider business requirements (including clients and customer contracts).

Compliance examples Climate Change Mitigation ***– indicative only;***

- Climate Change Levy Regulations.
- The CRC Energy Efficiency Scheme (closing after the 2018-2019 compliance year).
- The Climate Change Agreements Regulations.
- Mandatory Greenhouse Gas Reporting (In UK the 2006 Companies Act - amended 2013)
- Energy Efficiency Directive (in UK the Energy Savings Opportunities Scheme - ESOS).
- Display Energy Certificates.
- F-Gas regulations.
- Renewable energy requirements (e.g. Renewable Heat Incentive Scheme Regulations).
- Environmental Permitting Regulations (e.g. permitted emissions).
- Requirements concerning accuracy of your communications and 'green claims' (e.g. 2002 Sale and Supply of Goods Regulations and 2008 Business Protection from Misleading Marketing Regulations).
- City and Local Authority requirements (e.g. congestion charging and clean air zones).
- Planning conditions and building regulations (including Building regulations Part L).
- Customer requirements of contractual obligations (e.g. to report carbon footprint or energy performance). One example is Marks and Spencer's bronze, silver, gold assessment for suppliers against their framework for sustainability.
- Relevant voluntary schemes or standards the organisation has committed to such as BREEAM for construction, British Standards, ISO Standards, EU Ecolabel, CDP, RE100, Science based targets.

An extensive list of specific regulations can be relevant – Further UK examples include;

- The Assessment of Energy Performance of Non-domestic Buildings (Scotland) Regulations.
- Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations.
- The Climate Change (Scotland) Act.
- The Electricity Market Reform (General) Regulations.
- The Heat Network (Metering and Billing) Regulations.
- The Motor Fuel (Road Vehicle and Mobile Machinery) Greenhouse Gas Emissions Reporting Regulations.
- The Renewable Transport Fuel Obligations Order.
- The Van Benefit and Car and Van Fuel Benefit Order.
- Balancing and Settlement Code (BSC) P272 and P322.
- The Vehicle and Registration Act (Vehicle Excise Duty).

Compliance examples Climate Change Adaptation ***– emerging field examples again mainly UK***

Adaptation Reporting Power. In the UK, The Climate Change Act 2008 gives the government the power to ask certain organisations to produce reports on:

- Current and future predicted impacts of climate change on their organisation
- Their proposals for adapting to climate change

Environment Agency Flood risk and Environmental Permits. Relating to work:

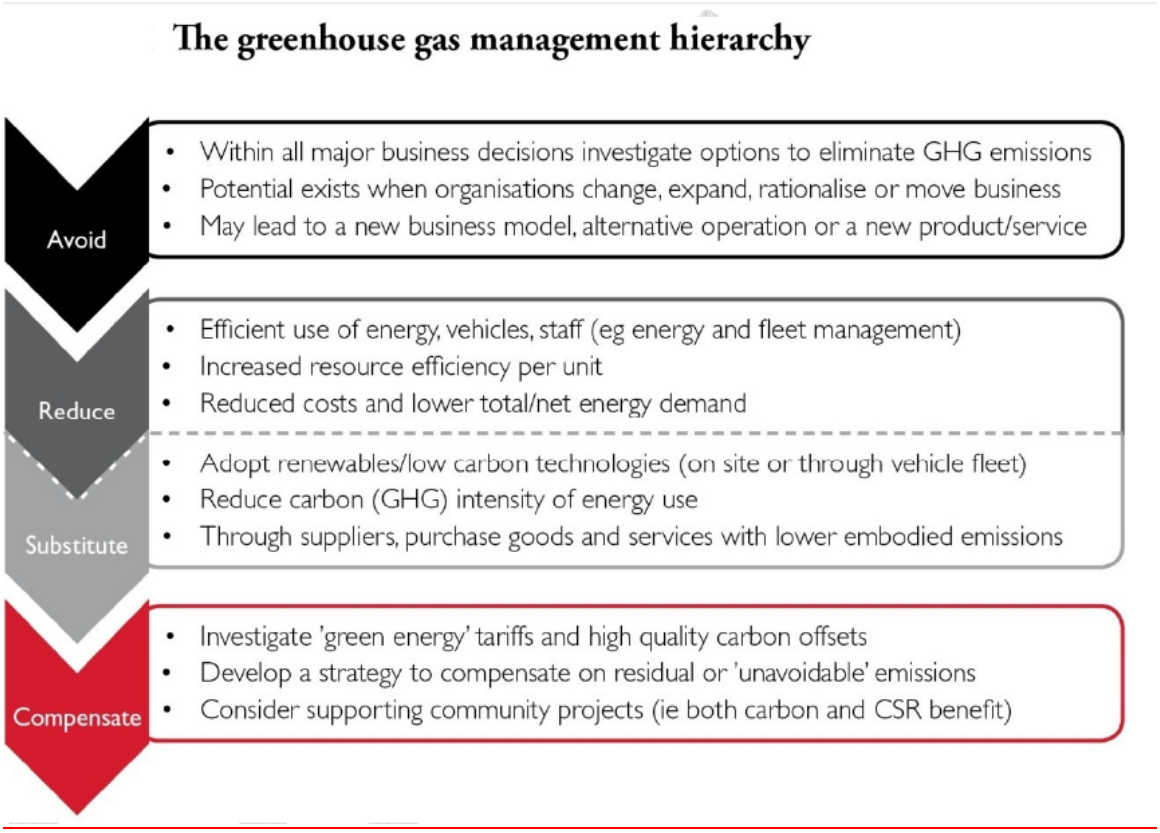
- on or near a main river
- on or near a flood defence structure
- in a flood plain
- on or near a sea defence

Contracted work and required design standards increasingly include consideration of future climate and weather conditions (e.g. for structures)

Amended EIA Directive and subsequent Regulations now include climate change. For example, in England through the Town and Country Planning Environmental Impact Assessment Regulations 2017. IEMA is updating its EIA Climate Change Adaptation guidance in 2018.

Planning permission requirements and building regulations, in particular concerning flooding and drainage. Can include 'green infrastructure' and ecosystem service approaches to water and flood management.

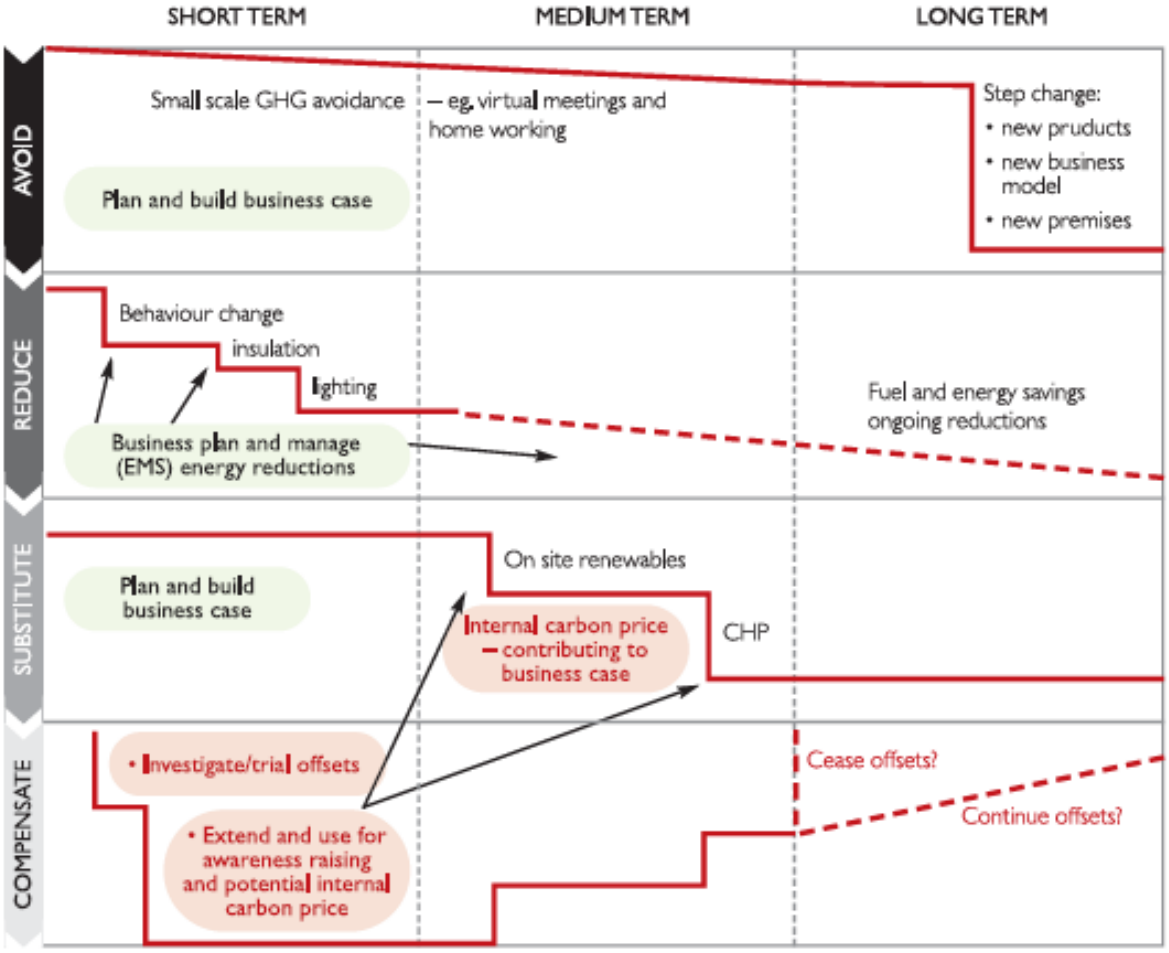
Objectives (6.2)	**Climate Change Considerations / Opportunities**
Environmental objectives and planning to achieve them. Informed by earlier work (policy, aspects, etc) develop environmental objectives. Within this, measurable targets will support performance improvement. In planning actions to achieve objectives / targets consider; - what will be done - required resources and who - timescales and phasing - target completion - how to evaluate results - consider how to integrate	This clause presents the opportunity to 'plan in' action to reduce your organisation's contribution to climate change e.g. through energy and emission improvement programmes. Similarly, this is the opportunity to adapt to the changing climate and to enhance organisational resilience. When developing objectives consider; Climate related commitments in the policy (5.2) Improvement options relevant to context (4.1) Requirements of interested parties (4.2) Risks and opportunities (6.1.1) Aspects and impacts (6.1.2) Compliance requirements (6.1.3) It is good practice to align targets within the wider business objectives and programme. When setting objectives and targets IEMA's Greenhouse Gas Management Hierarchy can provide a helpful framework (see next page -16).



IEMA's original GHG Management Hierarchy approach (above) was developed in 2009 as a framework to help scope and plan energy and carbon (GHG) reduction. Working through the hierarchy, priority is placed on 'at source' GHG avoidance, followed by energy reduction and then supported by substitution measures such as on-site renewable energy. After reviewing these opportunities, compensation measures are considered. This hierarchy approach can be useful in informing more effective decisions within mainstream business approaches (in later versions, compensation is no longer red, reflecting some improvements in standards and practice)
The hierarchy is a policy guide to help organisations focus on and consider their priority direct and indirect effects when making decisions on approaches to reduce energy and GHG emissions. It is not intended as a strict sequential hierarchy for every situation. An organisation may find measures lower down the hierarchy offer useful contributions whilst planning in longer term transitions.

The following diagram (page 17) illustrates how the hierarchy can be used in strategic planning. This is one of a number of scenarios organisations may follow in performance improvement through to transition. Bold red lines indicate the organisations planned 'carbon improvement' paths for each level of the hierarchy. Within this example the organisation is only able to achieve reductions and compensation in the short term through relatively easy energy savings (REDUCE) and early carbon offsetting (COMPENSATE). Planning and future business case development is scoped and scheduled in at an early stage (SUBSTITUTE and AVOID). This helps to ensure medium term progress through installation of onsite renewables and longer term via new premises and business models. An internal price for carbon is introduced early on (linked to purchased carbon offsets and woodland creation). Savings against this internal cost are made as a (small) part of the business case on future energy improvements.

LOW CARBON TRANSITION PLANNING
USING THE IEMA GREENHOUSE GAS MANAGEMENT HIERARCHY



Climate Change Mitigation - Example Objectives

- To become a pioneer low-carbon business in our sector.
- To establish a long-term carbon reduction strategy based on IEMA GHG management hierarchy.
- Investigate and diversify into new business models and innovative solutions.
- Review financial returns on investment approaches (ROI) and methods such as offsets or internal carbon price to strengthen the energy / carbon business case.
- Seek to establish (or contribute to) a leading sector-based initiative.
- Consider extending actions into indirect scope 3 GHG emissions (business travel, waste, supply chain) starting with an objective to review and estimate scope 3 'hot-spots'.
- Investigate the organisations investment portfolio.
- Investigate wider potential for actions such as carbon offsetting or woodland creation.

Mitigation - Example Targets

- Become zero-carbon or carbon-neutral by a set date (for all or part of the organisation).
- Complete energy audits across all sites, operations, fleet, processes by (set date).
- Implement at least primary energy improvement actions for 75% of audited sites.
- Set an absolute or a relative target for energy efficiency.

- Eliminate all F-gas leaks by audit, maintenance and upgrade of all units by specific date.
- Establish renewable energy targets (for on-site generation, purchased electricity or both).

- Set absolute Carbon (GHG) Reduction Targets (e.g. reduce scope 1 and 2 tCO_2e by X% of base year by 2020).
- Set relative/normalised Carbon (GHG) Reduction Targets (e.g. reduce scope 1 and 2 tCO_2e against turnover, or other factors by X% of base year by 2020). Other indices to consider include CO_2e reductions per unit of product or sales, per FTE, per m2 occupancy etc.

- Replace lighting in premises and car parks with LED by specific date (also address controls, BMS, motors, air conditioning, heating system etc).
- Install motion sensors across all public work spaces by specific date.
- Transition to XX% Electric Fleet by specific date.

Consider science-based targets for your organisation, aligned to longer term climate targets (such as Paris agreement or UK 2008 Climate Change Act)

Climate Change Adaptation - Objectives and Targets

Refer back to your climate risk register/business resilience/business continuity/disaster recovery/climate adaptation plans (6.1.1) aspects register (6.1.2) and any relevant compliance requirements (6.1.3) for prompts for action. Develop and set objectives and targets. Examples include:

- Complete a climate impacts review to identify sites and operations at highest risk (for a precautionary approach use high-end climate projections /scenarios).
- Complete supply chain review and identify contingency suppliers / options.
- X% of sites at low risk of flooding by 2025 or with thorough response plans.
- X% of first tier suppliers confirm that their supply chain is resilient to climate risks and/or have severe event contingency plans.
- Response plans for extreme events (such as heat waves).
- Heating and cooling approach and ability to cope with changes in temperature, power interruptions / contingencies etc.
- Relocate raw material storage areas to lower (Flood) risk location by specific date.
- Improve drainage systems on site, by specific date.

Support

Resources - (7.1)	**Climate Change Considerations / Opportunities**
Determine and provide necessary resources for the EMS. - Use internal approaches. - Seek external and wider resources through collaborative working?	This clause can support necessary resourcing to ensure climate action is embedded (i.e. is not just provided on reactive or project basis). The organisation's investment approach, CAPEX, annual budgets and business planning processes are all essential in this regard and need to be used Changing the rules of the game. In some cases, developing the internal business approach may be required through altering financial returns on investment (ROI) and pay-back periods. Broader resources beyond finances and usual sources are also in scope (see below on page 19)

Resources – Mitigation and Adaptation examples

- Integrating into budget provision across organisation and new contracting arrangements. Example may be developing an energy or carbon management team working to achieve reductions across the business.
- Increased budget for project and transition investments.
- Bid based funding with criteria, for de-carbonisation and energy reduction programmes (renewables, energy efficient equipment, transport fleet, buildings).
- Similar approach for adaptation to fund increased resilience (e.g. risk assessments, flood protection, modifications, contingency, employees).
- Budgets for setting a carbon price internally or for carbon offset projects to support claims of carbon neutrality (consider integrating these extra internal costs into investments and transformation business cases).
- Consider human as well as financial resources (e.g. making available other professionals, specialist contributions and board level time).
- Physical resources may be helpful such as infrastructure and equipment made available.
- Surplus land may be released and used – for example in woodland creation.
- Funding partnerships within a sector or supply chain (the seed-corn resource being the CEO's time and commitment to lead a collaboration).
- Investing in research and development of products.
- Consider pilot programmes and trials as a stepping stone to wider / future funding.
- Opportunities for grants and financial incentives and R+D returns.

Important to this section is considering the whole-life costs, factoring in energy and carbon costs correctly, getting different cost centres to work with one another and ensuring any incentives are effective (i.e. maintenance OPEX versus procurement CAPEX).

Competence (7.2)	**Climate Change Considerations / Opportunities**
Ensure employees and contractors have the correct range and depth of competencies. Refer to IEMA Skills map.	Ensure competence exists across both mitigation and adaptation and in all key roles and situations (refer to earlier work on policy, aspects, objectives). Consider roles, recruitment, procurement, training and development. Organisations may address this clause by completing a competency matrix to review capacity against climate change requirements.

Competence is required across multiple levels and over a diverse range of roles - for example;

- Within the Leadership team (e.g. lead champion Director).
- Corporate Sustainability roles.
- Environmental Management (EMS team).
- Energy Manager (Facilities and HSE).
- Energy and environmental audits.
- Corporate reporting and GHG accounting (footprints).
- Impact assessment and risk evaluation.
- Data, scenario analysis, projections.
- Finance, economics, cost-benefit analysis.
- Business resilience and continuity.

- Design, Architecture and Engineering.
- Procurement and purchasing.
- Product development.
- Marketing and communications.
- Land management and conservation.
- Specific – e.g. driver efficiency training.

Employees and general workforce, contractors and sub-contractors – e.g. Energy awareness.

Awareness (7.3)	Climate Change Considerations / Opportunities
Personnel must be aware of: environmental policy, significant aspects associated with their work, contributing to effectiveness, and implications of non-compliance.	There needs to be an appropriate level of general awareness of our changing climate and the associated risks and opportunities to the organisation. This also relates to an awareness of the elements of the EMS that have been developed to address climate change (e.g. relevant objectives). Important to ensure proper awareness of both adaptation and mitigation and the key difference throughout the EMS. As a foremost environmental challenge with inter-generational consequences and social implications today (flooding, crop failure, poverty, well-being, economic change, migration) climate change is a highly visible issue for employee engagement. Artificial Intelligence and new technologies are changing some of the dynamic around employee engagement (e.g. choice editing).

<u>Awareness – Both Mitigation and Adaptation</u>

A range of opportunities exist across mitigation and adaptation. There is also an opportunity for integrating an awareness approach, using visible climate impacts (adaptation agenda) to emphasise the urgency for action on the causes of climate change (mitigation agenda). Examples of methods to increase awareness;

- Engage workforce in discussion/workshop (essential buy-in secured).
- Engagement days (e.g. 'green-day' involving leadership).
- Meetings/presentations.
- Using resources e.g. videos.
- Incentives and campaigns.
- Posters (e.g. sharing performance information or plasma screens).
- Awareness of documents / processes (e.g. local flood risk map, energy management protocol).
- Awareness of business resilience, emergency response plans, contingency measures – e.g.
    - What to do in the event of a flood.
    - How to engage flexible working plan.
    - How to adapt supply chain accordingly.
    - How to use flood defence resources (e.g. barriers).

A range of work has been undertaken by many professions to better understand differing motivations for engagement and behaviour change (sustainability and marketing through to psychology). These studies have in recent years informed a range of approaches in differing situations (employees, customers, etc). Engagement programmes can require careful planning to ensure lasting impact and effectiveness.

Communication (7.4)	Climate Change Considerations / Opportunities
Develop a process (plan) for internal and external communications (what, when, with whom, how). Information communicated must be reliable. Implement the plan for internal and external communications.	Internal communication approaches need to support and encourage employees to contribute to improved performance in the EMS (i.e. supporting the organisation's actions on climate change).

Communication – Internal communication examples

- Energy performance KPI updates (mitigation).
- Employee talks re objectives (progress updates and briefings).
- Clear communication mechanisms for emergency response with internal staff (adaptation).
- Promoting two-way communication (e.g. suggestion box, on-line suggestion schemes, observation Apps, crowd-sourced approach, employee competitions and awards).

Communication - External examples

- Annual GHG (Carbon) emissions within Directors reports/annual report/financial reports.
- GHG information to key stakeholders (e.g. investors, regulators and disclosure schemes).
- UK Government encouraged companies to publish their adaptation reports under the Adaptation Reporting Power. Particularly applies to infrastructure operators, utilities etc (also helps inform governments adaptation plans which are communicated widely online).
- Customer communications (e.g incentivised marketing campaigns/charitable cause association).

Others

- Communication mechanisms for emergency response to external parties (e.g. Environment Agency and Local Authority if a flood has caused contamination of land/surface water drain/water course or storm damage has resulted in waste escaping to wider the environment).
- If the organisation is a utility company they will have a plan to respond to disruption in supply and to inform relevant parties.
- Public services may need a warning system to customers or the public of disruption and alternative options.
- A Highways agency may use motorway signs and radio announcements to issue travel warnings.

Documented Information (7.5)	Climate Change Considerations / Opportunities
Consider and determine required documented information 'required' and 'necessary'. Identify, format, review, and approve. Ensure information is available, suitable, protected and controlled.	Consider which Climate Change related requirements from the whole EMS should be documented where this may be useful to stakeholders as well as the organisation. Also seek opportunity to embed into wider documentation processes. Having a documented procedure can help to ensure performance improvement becomes embedded and assists consistency of approach.

Documentation – Potential examples can include

- Climate change risk and opportunities register and supporting information.
- Carbon (GHG) accounting procedure and associated data records, including energy and gas bills, stack emissions monitoring records.
- Carbon footprint reports.
- Energy and carbon objectives and plans.
- Operating instructions for plant and equipment and processes.
- Switch off campaign details.
- Job descriptions.
- Climate Adaptation plan.
- Business resilience/continuity/contingency/disaster management/emergency response plan(s).
- Incident reports (e.g. flood/fire/failure of supply etc).

OPERATION

Operation / Planning / Control (8)	Climate Change Considerations / Opportunities
Establish operational controls to implement EMS actions, 6.1, 6.2 etc. Control measures to mitigate risks or capitalise on opportunities (6.1.1) aspects (6.1.2) compliance requirements (6.1.3) and plans to achieve them (6.2). Includes further reference to life-cycle approach and communication.	Include planned changes, outsourced processes, procurement, and design and development of products and services. Integrating controls into the business operation and communicating. Within ISO 14001 this clause provides the opportunity for operationalising climate change action across the organisation and with suppliers and clients. Both internal control and establishing 'sustainable procurement' arrangements. The clause allows wide examination for developing operations and controls that 'build-in' life-cycle thinking and more sustainable outcomes.

This clause in the EMS is an opportunity to introduce sustainable design considerations into product and service design processes, procedures, controls. Often used to address energy and carbon reduction, this can also address resilience and adaptation concerns (designing a commercial delivery or a social service or product that will be well adapted to future weather conditions).

Operation / Planning / Control – examples

- Control procedures on your methods and systems for calculating carbon (GHG) footprints (i.e. to operationalise from your chosen GHG standard into the organisation).
- Operational guidelines for the building energy management system.
- Specifying requirements for out-sourced contractors and services (for responses in extreme weather events, for energy efficiency practices and processes or contractual requirement to report carbon or energy data).
- Operating instructions for plant and equipment (mitigation and adaptation considerations).
- Control arrangements for business continuity through the supply chain in extreme weather or changing conditions globally.
- Organisational control approach for employees and service delivery / interruption during extreme weather events (adaptation).
- Process, guidelines and controls on responsible driving of vehicles (mitigation).

- Procedure for design of products at each stage or gate of the design process - life cycle perspective with consideration of climate risk, opportunities and energy efficiency. For example, does your product have any unnecessary components that can be eliminated? Can your product be made lighter? Can your product or service be designed so that it lasts longer, can the product be fully disassembled at the end of its life? Can you provide a take back service? Such innovations will not always require advanced technical design (e.g. a washing machine design company replaced the concrete block with an empty plastic bladder which could be filled with water on first use – reducing emissions at the production and distribution phases).
- Consider your buildings. Can they be upgraded / designed to be energy efficient? Architects might consider a range of design considerations - SAP rating of buildings, passivehaus schemes, embedded carbon in materials specification. Consider how this EMS clause can support these considerations to be 'planned-in'.
- Guidelines, controls and procedures for purchasing and procurement. Consider the distance materials travel, the climate strategy/commitment of organisations you purchase from, the embodied energy and water in the materials purchased. Do purchasing decisions contribute to deforestation? Can you incorporate reused/remanufactured/upcycled elements into your products? Is packaging kept to a minimum and what are the end of life options?
- Arrangements to underpin collaborations and partnerships (e.g. Wallmart's project gigaton).

Emergency preparedness / response (8.2)	**Climate Change Considerations / Opportunities**
Establish, test and review emergency plans/processes. Prevent or mitigate adverse impacts. All climate related risks and emergencies will have been identified in earlier clauses. This clause requires organisations to plan how to respond should any of these emergencies occur. Also to test and review these plans and processes and provide adequate training and information.	Mainly relates to Adaptation agenda, but mitigation can also be in scope (e.g. impact of extreme weather on renewable energy supplies). Preparing the organisation through the EMS to be resilient to extreme weather events where these have potential to significantly impact environment and the organisation or stakeholders (i.e. major severity impact level). An opportunity to consider both cumulative and in-combination effects of climate change. Also, in some instances to consider the interaction between mitigation and adaptation.

Performance Evaluation

Monitoring, Measurement, Analysis and Evaluation (9.1)	Climate Change Considerations / Opportunities
Monitor, measure, analyse and evaluate environmental performance: • Methods to use. • Performance indicators. • Calibration. Communicate environmental performance (7.4). Evaluate fulfilment of compliance obligations (6.1.3). Maintain knowledge of compliance status.	There will be significant monitoring and measuring requirements associated with climate related issues (and this will support performance improvement). This should link back to climate related commitments in the policy (5.2), risks and opportunities analysis (6.1.1), aspects evaluation (6.1.2), compliance requirements (6.1.3), objectives (6.2.1) and operational controls (8.1). Use monitoring data for evaluation and decision making (to confirm, reinforce, or adapt strategy and tactics).

Monitoring, measurement, analysis, evaluation – Mitigation

Monitor, measure, analyse and evaluate with a view to manage, control and reduce energy consumption and carbon (GHG) emissions. For example:

- Degree of compliance with Climate Change Mitigation related regulations.
- Stack emissions, on-site combustion and process related emissions (scope 1).
- Energy consumption (you may be managing this data already for cost saving opportunities or compliance with ESOS requirements).
- Consumption and GHG calculations on different energy sources and fuels:
    - ~ Electricity by grid emission factors and potentially also based on market-based factors in transparent dual accounting approach (GHG Protocol Scope 2 guidance[3]).
    - ~ Onsite renewables (production, consumption and export to grid if applicable).
    - ~ Other sources such as diesel generators, gas consumption, transport fuels.
- Using data related to fugitive emissions (maintenance of air conditioning equipment and energy management systems).
- Transport data for vehicle fleet and wider business travel.
- Data relating to management of land where this is contributing to a net GHG reduction (e.g. regarding woodland creation and associated GHG removals).

Wider indirect (Scope 3) emissions may be included relating to materials supplied to you and to the use phase of your own products or services.

You may also be using this data to analyse and evaluate environmental performance against criteria (e.g. in an environmental permit) or your own improvement goals and objectives. Or to evaluate compliance (e.g. against ESOS or Climate Change Agreements).

[3] Grid average emission basis provides a default factor for electricity consumption GHG emissions. Market based emission factors (sometimes reflecting 'green' tariffs) may also be used but only in addition (not alone). For information refer to the GHG Protocol 2014 Scope 2 guidance

Monitoring, measurement, analysis, evaluation – Adaptation examples

You may also manage and evaluate data related to climate impacts on your business such as:

- Weather reports.
- Number of/cost of storm damage to your premises or property.
- Employee days lost to severe weather incidents.
- Disruption to supply chains.
- Impacts upon infrastructure.
- Impacts upon service delivery and operations.
- Water consumption and related supply data (e.g. disruption, cost).
- If you are a construction company, you may monitor number of site based working hours lost due to weather impacts.
- In food and agriculture you may evaluate yield impact from changing weather and growing season.

Also use data to evaluate the effectiveness of adaptation measures.

Internal Audit (9.2)	**Climate Change Considerations /Opportunities**
Establish an internal audit programme, using impartial auditors. Carry out audits to determine conformance and effectiveness.	Internal audit process is essential to check progress against EMS climate change related performance (e.g. policy, procedures, objectives, targets). Energy or GHG audits may already be a feature in your annual audit schedule. This will be especially true of organisations that fall under legal requirements – e.g. to disclose annual GHG emissions (UK mandatory GHG reporting) or to complete Energy Audits under the Energy Efficiency Directive (ESOS within the UK).

Regular audits across the organisation, help to support the EMS in driving action on energy management, GHG reduction and adaptation to climate impacts:

- Procedure and process audits.
- Energy consumption and fugitive emissions.
- Energy audits (within ESOS these identify improvement opportunities).
- Travel and transportation.
- Fuel usage.
- Sustainable procurement and purchasing.
- Supply chain.
- Equipment, processes, buildings.
- Employees and contractors.

Management Review (9.3)	Climate Change Considerations /Opportunities
Top Management to review the EMS to ensure continuing suitability, adequacy and effectiveness. A list of agenda items is specified e.g: results of audits, changes, and objectives. Use ISO 14001 (2015) new requirements as an opportunity to enhance this review step (considerations including the leadership emphasis, life-cycle thinking and climate change adaptation). Consider opportunities to improve integration of the EMS within the main business processes and any implications for the strategic direction of the organisation.	The management review is a key component in the Plan-Do-Check-Act model and crucial for driving on-going continual improvement. Consistent with the leadership clause (5.1) there is a requirement for Top Management to take ownership for the effectiveness and success of the EMS in achieving its intended outcomes. Review approaches can be supplemented (informed or supported) with additional steps and 'pre-review' leadership engagement. This may involve leadership (or board experts) joining sessions on horizon scanning and reviewing performance trends. This also can be supported by use of external experts or stakeholders within an environmental advisory panel (e.g. safe-space reviews and input from 'critical-friends'). Techniques can be adopted such as 'Back Casting'. Consider integrating with mainstream review processes on risk, income, business continuity, etc. This could involve the Corporate Risk Register. However, some processes are very short-term in their framing. Longer term review is increasingly an important consideration, with companies starting to adopt science-based targets and techniques such as scenario analysis[4]. Techniques such as systems thinking and understanding Natural Capital dependencies[5] can assist. The EMS review provides an opportunity for top management to contribute to the on-going development of the EMS and acts as a prompt to revisit key consideration such as the (changing) context of the organaisations, external and internal issues of relevance, views of interested parties, risks and opportunities, aspects and impacts as well as planned changes to the organisation.

[4] TCFD 2017 has both a summary and Technical Annex on use of scenario analysis

[5] Natural Capital Protocol (a primer – introduction to Natural Capital approach for organisations

IMPROVEMENT

General (10.1)	Climate Change Considerations /Opportunities
Determine opportunities for improvement in the EMS (and via 9.1, 9.2 and 9.3).	Are there opportunities to improve the EMS in order to reduce the organisation's contribution to climate change and an increased resilience of the organisation to the impacts of our changing climate? For example: • Corrective action and continual improvement. • Incremental change (efficiencies). • Breakthrough change (new products, markets, purpose, business model). • Innovations. • Collaborations and partners. • Re-organisation.

Nonconformity and Corrective Action (10.2)	Climate Change Considerations /Opportunities
When a nonconformity occurs - react, evaluate, implement action needed. Review the effectiveness of action, make change to EMS if necessary. Report / record as appropriate.	Non-conformities may arise from a number of sources. E.g: - Audit results. - Inspection results. - Compliance evaluations. - Customer complaints. - Staff concerns.

Mitigation examples may include:

- Damage to plant or equipment that leads to the escape of f-gas or reduced efficiency.
- Stack emissions exceed permit.
- Energy consumption higher than target.
- Plant/vehicles equipment being left on/running when not in use in conflict to policy.
- Incorrect choice of energy source (e.g. diesel generators in use when grid electricity was an option).
- Energy inefficiencies due to not following procedures.
- Equipment settings inconsistent with optimal operating criteria.

Continual Improvement (10.3)	Climate Change Considerations / Opportunities
Continually improve the EMS to ensure enhanced environmental performance.	All clauses of ISO 14001:2015 can be used to promote a reduced contribution to climate change and an increased resilience of the organisation to the impacts of our changing climate. The EMS should be continually improved, and the environmental performance should be enhanced as a result. Environmental performance can be enhanced by applying the EMS as a whole or improving one or more of its elements. As mentioned in 9.3 this could be the opportunity to increase the organisation's ambition for climate action; e.g. if the organisation has not done so already, consider signing up to voluntary initiatives such as: - Voluntary disclosure (e.g. schemes such as CDP). - United Nations Global Goals for Sustainable Development. Goal 13. Climate Action. - Set science-based targets. - Consider joining climate initiatives such as the Caring for Climate initiative or RE 100.

Acknowledgements

This guidance has been compiled in response to professionals requesting a 'how to' briefing into achieving action on climate change when working with an Environmental Management System (EMS). International Standard ISO 14001 (2015) is a primary reference, however the guidance will be valuable for any professional or organisation seeking improved organisational performance on climate risks, carbon reduction and energy efficiency.

This draft was authored by Anna-Lisa Mills (True North Sustainability), along with Nick Blyth (IEMA) and with input from Marek Bidwell (Bidwell Management Systems). Among many people who have contributed to date are Lucy Candlin, David Dowson, Colin Robertson, Clare Day, Richard Lupo, Bekir Andrews, Martin Baxter, Kirit Patel, Kulkarni Tushar and Clare Topping. The guidance is being developed by IEMA's Climate Change and Energy Network.

About IEMA

We are the worldwide alliance of environment and sustainability professionals, working to make our businesses and organisations future-proof. Belonging gives us the knowledge, connections and authority to lead collective change, with IEMA's global sustainability standards as our benchmark. By mobilising our expertise we will continue to challenge norms, drive new kinds of enterprise and make measurable progress towards our bold vision: transforming the world to sustainability. Join us at www.iema.net

To feedback comments or suggestions on this guidance - Survey available during June and July 2018

Annex - Additional Information

The table below lists some additional standards, guidance, frameworks and tools relevant to climate change and environmental management. Section A lists the sources that have been identified by Practitioners as particularly helpful, section B provides the full list of suggestions to date (for those that may want to explore the topic further).

Section A – Key sources that have been identified by Practitioners as particularly helpful when supporting Climate Change action via ISO14001 or other Management System.

Ref	Name of source (and comments where helpful)	Link to more info
International (ISO) Standards and Management system frameworks:		
1.	BS EN ISO 14001:2015 (ISO 14001:2015, Environmental management Systems – Requirements with guidance for use.	https://shop.bsigroup.com/
2.	BS EN ISO 14004, Environmental management systems – General guidelines on principles, systems and support techniques.	https://shop.bsigroup.com/
3.	BS EN ISO 14064-1:2012 Greenhouse gases. Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.	https://shop.bsigroup.com/
4.	BS EN ISO 50001:2011 - Energy management systems. Requirements with guidance for use.	https://shop.bsigroup.com/
5.	BS ISO 26000:2010. Guidance on social responsibility. (Note: This is not a management system standard. It is not intended for certification purposes or regulatory or contractual use. Useful context on how Climate Change fits into sustainable development.)	https://shop.bsigroup.com/
Additional carbon reporting guidance, frameworks and standards:		
6.	Greenhouse Gas Protocol	https://ghgprotocol.org/
7.	PAS 2050:2011. Specification for the assessment of the life cycle greenhouse gas emissions of goods and services.	https://shop.bsigroup.com/ *Free to download
Further information and guidance:		
8.	EMAS (Eco-Management and Audit Scheme) Note: This website has some useful case studies and tools to assist management systems.	http://ec.europa.eu/environment/emas/emas_for_you/achievement_best_practices/case_studies_en.htm
9.	The Paris agreement and UNFCCC The Paris agreement in 2015 saw 195 of the world's governments commit to prevent dangerous climate change by limiting global warming to well below 2 degrees celsius.	https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
10.	Science-Based Targets Targets adopted by companies to reduce greenhouse gas (GHG) emissions are considered "science-based" if they are in line with the level of decarbonization required to keep global temperature increase below 2 degrees Celsius compared to pre- industrial temperatures, as described in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR5).	http://sciencebasedtargets.org/
IEMA resources		
11.	IEMA (2017) Sustainability in Practice guide - Change Management for Sustainable Development.	www.iema.net

12.	IEMA (June 2017) Future Megatrends How to Identify and Integrate These into Your Environmental Systems	www.iema.net
13.	IEMA (2014) Position statement on Climate Change and Energy.	www.iema.net
14.	IEMA (2013) Climate change adaptation. Building the business case. Guidance for environment and sustainability practitioners.	www.iema.net
Example UK resources		
15.	Climate Projections at the Met Office. Authoritative information on future climate in United Kingdom	http://ukclimateprojections.metoffice.gov.uk/
16.	Committee on Climate Change (CCC). The CCC is an independent, statutory body established under the Climate Change Act 2008. Their purpose is to advise the UK Government and Devolved Administrations on emissions targets and report to Parliament on progress made in reducing greenhouse gas emissions and preparing for climate change. Excellent credible information that can also be used by businesses in their strategy and planning	www.theccc.org.uk
17.	UK Climate Change Risk Assessments; • 2012 UK Climate Change Risk Assessment • 2017 UK Climate Change Risk Assessment	http://randd.defra.gov.uk/Document.aspx?Document=10067_CCRAEvidenceReport16July2012.pdf https://www.theccc.org.uk/tackling-climate-change/preparing-for-climate-change/uk-climate-change-risk-assessment-2017/
18.	Environmental Reporting Guidelines: including mandatory greenhouse gas emissions reporting guidance.	https://www.gov.uk/government/publications/environmental-reporting-guidelines-including-mandatory-greenhouse-gas-emissions-reporting-guidance
19.	UK Government provides GHG emission factors for use in GHG reporting	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting
20.	UKCIP Tools include: - Adaptation Wizard, is a risk-based adaptation resource. - BACLIAT vulnerability assessment developed with UK businesses. A workshop-based process to help you quickly scope potential impacts of future climate change on your organisation. Can be used as a standalone tool, or as a step in a risk-based framework (like Adaptation Wizard). - Archive of adaptation case studies - how other organisations are planning / adapting to climate change.	https://www.ukcip.org.uk/wizard/

Section B – Further suggested sources that you may wish to explore to support Climate Change action via an EMS (note: items listed in section A are repeated below).

International standards and Management Systems Frameworks:

21. EMAS (Eco-Management and Audit Scheme)
22. BS 8555:2003. Environmental management systems. Guide to the phased implementation of an EMS including the use of environmental performance evaluation
23. BS EN ISO 14001:2015 (ISO 14001:2015, Environmental management Systems – Requirements with guidance for use.
24. ISO 14004, Environmental management systems – General guidelines on principles, systems and support techniques
25. ISO 14006, Environmental management systems – Guidelines for incorporating ecodesign
26. ISO 14040 series: Life-cycle assessment.
27. ISO 14044, Environmental management- Life cycle assessment – Requirements and guidelines
28. ISO 14031, Environmental management – Environmental performance evaluation - Guidelines
29. ISO/TR 14062:2002: Environmental management — Integrating environmental aspects into product design and development.
30. ISO 14063, Environmental management – Environmental communication – Guidelines and examples
31. 17/30334569 DC. BS ISO 14080. Greenhouse gas management and related activities. Framework and principles for methodologies on climate actions.
32. ISO 14063, 2006, Environmental management — Environmental communication — Guidelines and examples.
33. BS EN ISO 14064-1:2012. Greenhouse gases. Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
34. BS EN ISO 14064-2:2012. Greenhouse gases. Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements
35. BS EN ISO 14064-3:2012. Greenhouse gases. Specification with guidance for the validation and verification of greenhouse gas assertions
36. BS ISO 14066:2011. Greenhouse gases. Competence requirements for greenhouse gas validation teams and verification teams.
37. 17/30334569 DC. BS ISO 14080. Greenhouse gas management and related activities. Framework and principles for methodologies on climate actions.
38. ISO 50001, Energy management systems – Requirements with guidance for use
39. ISO 50002:2014. Energy audits. Requirements with guidance for use.
40. BS ISO 50015:2014. Energy management systems. Measurement and verification of energy performance of organizations. General principles and guidance.
41. BS EN 16247-5:2015. Energy audits. Competence of energy auditors
42. BS EN 16247-4:2014. Energy audits. Transport
43. BS ISO 26000:2010. Guidance on social responsibility.
44. IWA 26:2017. Using ISO 26000:2010 in management systems.
45. BS ISO 20400:2017. Sustainable procurement. Guidance.
46. ISO 19011, Guidelines for auditing management systems
47. ISO 31000, Risk management – principles and guidelines
48. ISO Guide 73. Risk management - Vocabulary

49. AA1000 Stakeholder Engagement Standard, 2011, AccountAbility.
50. Global Reporting Initiative (GRI)
51. The Natural Capital Protocol

Carbon reporting guidance, frameworks and standards:

52. Greenhouse Gas Protocol (several standards and resources including scope 2 guidance)
53. PAS 2050:2011 Specification for the assessment of the life cycle greenhouse gas emissions of goods and services
54. PAS 2060:2014. Specification for the demonstration of carbon neutrality.
55. PAS 2070:2013+A1:2014. Specification for the assessment of greenhouse gas emissions of a city. Direct plus supply chain and consumption-based methodologies.
56. PAS 2080:2016. Carbon management in infrastructure.
57. DEFRA: Environmental Reporting Guidelines: including mandatory greenhouse gas emissions reporting guidance
58. DEFRA: Small business user guide: Guidance on how to measure and report your greenhouse gas emissions
59. The Woodland Carbon Code – UK Forestry Commission
60. The Peatland Code - IUCN

Reference for carbon (GHG) calculations:

61. Greenhouse gas reporting - Conversion factors
62. International Energy Agency - Conversion factors
63. ICE Database – Bath University (free resource being updated in 2018)
64. UN database on factors
65. UK Government Greenhouse gas conversion factors.
66. UK Government guidelines for F Gas regulations for a list of refrigerants and some common trade names:
67. UK Government guidelines for F Gas regulations - calculations

Voluntary initiatives:

68. Caring for Climate
69. Climate Disclosure Standards Board
70. United Nations Global Compact
71. United Nations Global Goals for Sustainable Development (SDGs). Goal 13 – Climate Action.
72. Future-Fit Foundation

Further information:

73. UK Government, 2012, 'UK Climate Change Risk Assessment: Government Report' The Stationery Office. Also see UK-CCRA 2016.
74. United Nations Framework Convention on Climate Change, climate-change adaptation reports.
75. The Intergovernmental Panel on Climate Change (IPCC) reports make an important contribution to our understanding of climate change.
76. United Nations Framework Convention on Climate Change (UNFCCC)
77. World Bank Report: Turn Down the Heat: Climate Extremes, Regional Impacts, and the Case for Resilience
78. Responsible Corporate Engagement in Climate Policy -- over 100 companies committed to action (2015)
79. The Guide for Responsible Corporate Engagement in Climate Policy (2013)
80. Where Do Companies Stand on Policy Engagement? (2014)
81. Science-Based Targets

82. Science-Based Targets: Status Update 2015 (2015)
83. Are you Aligning your Emissions Reduction Targets with Climate Science? (2014)
84. The Business Case for Responsible Corporate Adaptation: Strengthening Private Sector and Community Resilience (2015)
85. Business and Climate Change Adaptation: Toward Resilient Companies and Communities (2012)
86. Adapting for a Green Economy: Companies, Communities and Climate Change (2011)
87. RE100
88. CDP (Formally the Carbon Disclosure Project)
89. Confessions of a Radical Industrialist: How Interface proved that you can build a successful business without destroying the planet (2011) by Ray Anderson
90. EU Ecolabeling Scheme
91. Go Fossil Fuel Free – Divestment
92. http://www.lse.ac.uk/GranthamInstitute/
93. http://www.imperial.ac.uk/grantham/
94. http://www.tyndall.ac.uk/ - http://kevinanderson.info/
95. Edie: www.edie.net
96. Carbon Brief: https://www.carbonbrief.org/
97. Business green: https://www.businessgreen.com/
98. Ends: https://www.ends.co.uk/
99. Transform (IEMA Magazine): https://transform.iema.net/

IEMA resources

100. IEMA (2017) Sustainability in Practice guide - Change Management for S.D.
101. IEMA (2017) Future Megatrends How to Identify and Integrate into EMS
102. IEMA (2017) E.M. Briefing: Sustainable Resource Management ISO 14001
103. IEMA (2017) EIA guide -Assessing Greenhouse gas emissions /evaluating significance
104. IEMA (2016) Briefing - Beyond the Perfect storm - Corporate Sustainability Challenge
105. IEMA (2015) EIA guide to Climate Change Adaptation and Resilience
106. IEMA (2014) Position statement on Climate Change and Energy.
107. IEMA (2013) Climate change adaptation - Building the business case
108. IEMA (2010) Special Report: GHG Management and Reporting
109. IEMA (2009) Practitioner Volume 14 Mitigating climate change
110. IEMA (2009) Practitioner 13 Adapting to climate change

More sources

111. UK Committee on Climate Change
112. Climate Projections https://www.metoffice.gov.uk/research/collaboration/ukcp
113. UKCIP
114. BEIS
115. DEFRA
116. Task Force on Climate Related Financial Disclosure
117. BSi
118. Environment Agency
119. European Commission Environment
120. Forum for the Future
121. UK Government - Behavioural Insights Team
122. Prince of Wales Corporate Leadership group on Climate Change
123. New Climate Economy