



Environment Protection Authority

EPA Climate Change Policy



The NSW Environment Protection Authority's policy for addressing climate change and protecting the environment



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Acknowledgement of Country

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The NSW Environment Protection Authority acknowledges that Aboriginal people have a spiritual and cultural connection and an inherent right to protect the land, waters, sky and natural resources of NSW. This connection goes deep, and has since the Dreaming.

The entire landscape, including traditional lands, fresh water and seas, has spiritual and cultural significance to Aboriginal people. If the cultural and spiritual values of Aboriginal people are sustained by providing protection and respect, then many other components of Aboriginal life will be healthy. By this understanding there is no separation of Country, culture, waters and wellbeing. The health of the natural environment, fresh waters, land animals, marine animals and people are intimately connected.

In compiling this policy, the EPA recognises that Aboriginal people as the first protectors have continuously cared for Country and been able to live effectively with changing climates for thousands of generations. Intergenerational knowledge handed down through vibrant cultures has meant Aboriginal people have intimate and detailed knowledge of their respective Country and climates. This knowledge has also resulted in effective understanding and management of place, including seasonal calendars which relate to specific lands and waters that guide Aboriginal people on climate matters.

The EPA recognises the connection of Aboriginal people to their land, their waters and surrounding communities and acknowledges their history and cultures here on this land.

We also acknowledge our Aboriginal and Torres Strait Islander employees are an integral part of our diverse workforce and recognise the knowledge embedded forever in Aboriginal and Torres Strait Islander custodianship of Country and culture.

Dharawal Country, Royal National Park, NSW



The EPA's Statement of Commitment to Aboriginal People of NSW

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We, the NSW Environment Protection Authority, acknowledge Aboriginal people as the enduring Custodians of the land, sea, waters and sky of NSW.

We recognise the entire NSW landscape, including the lands, waters, plant and animal species and seas, has spiritual and cultural significance to all Aboriginal people of NSW. By this understanding there is no separation of nature, wellbeing and culture. The health of the natural environment and the health of people and culture are intimately connected. In the spirit of reconciliation, the EPA is committed to:

- work in respectful partnership with Aboriginal peoples
- actively learn from and listen to Aboriginal voices, cultures and knowledges
- act boldly and bravely to play our part to mend and heal Country together
- respect Aboriginal people's knowledge and science as an equal to conventional science
- include Aboriginal knowledges and science in EPA decision-making
- ensure Aboriginal knowledge, science and Indigenous cultural and intellectual property is protected
- address both the tangible and intangible cultural elements of environmental protection
- deliver on results that have direct benefits for Aboriginal communities
- embed consistent, meaningful, and trustworthy engagement with Aboriginal communities
- improve Aboriginal cultural competency across the agency
- improve Aboriginal employment across the agency
- monitor the impact of this commitment.

Foreword by Chair of the Board



There have been many important moments in the EPA's 30-year history, but this initial *Climate Change Policy* document may be the most significant milestone of all. This is a first for any Australian state. It sets in train climate-change-related policies and actions to actively regulate greenhouse gas emissions and encourage the many NSW businesses licensed by the EPA to transition to a net zero-emission economy.

The policy and its accompanying action plan build on the work of the NSW Government through the *NSW Climate Change Policy Framework*, *Net Zero Plan* and *Climate Change Adaptation Strategy*. They set the stage for how we intend to help achieve the ambitious targets set by the Government, mitigate climate impacts and make our environment and community more resilient to withstand the changes that are already being felt.

This is no easy path but as I write this foreword, the reasons for acting to slow climate change are clear to those families, communities and small businesses that have borne the brunt of the impacts. We are now experiencing the fourth round of record-breaking floods in NSW. Communities from Lismore in the north to Eugowra in the central west have seen hundreds of people rescued from rooftops as everything they owned and loved was washed away. Billions of dollars will be spent as we help these communities rebuild, but not even that will bring back everything that has gone.

These floods were preceded by the 2019–20 bushfires, by far the worst in Australia's recorded history, which stretched across three states, killed wildlife on a scale never seen before and blackened our skies for months on end. During that period, Penrith in Sydney's outer west experienced a 48.9°C day.

We also recognise that to combat climate change at this scale, our stakeholders will have to make some difficult transitions. That's why to get to this point the EPA consulted widely to map out the staged path described in these pages that show how we will work with our licensees, councils, experts, other government agencies and the community.

But the EPA's climate change policy and action plan are just the first step to tackle climate change, not the last. Now is the time for action. From here, every three years we will revisit our policies and actions and evolve them according to the climate change challenges we face.

The EPA Board is invested in and supports this process and the way the EPA is responding to its climate change commitments. This is an important moment, but it is just the beginning of our journey to net zero emissions and a sustainable NSW.

A handwritten signature in black ink, appearing to read 'Rayne de Gruchy'.

Rayne de Gruchy AM PSM
Chair of the Board

Foreword by EPA CEO



I am pleased to present the NSW Environment Protection Authority's inaugural *Climate Change Policy and Climate Change Action Plan 2023–26* – the first plan of its kind for any environment regulator in Australia. It marks an important step in Australia's transformation to a prosperous, zero emissions economy and society.

While the EPA has always had a legal duty to protect the community and environment from harm, it has never had a single, clear policy and plan to tackle one of the greatest threats to our health, environment, and future prosperity – climate change. This document fulfils that need, and as it evolves over time it will be the cornerstone of the EPA's response to managing both the causes and impacts of climate change in NSW in the years to come.

As part of this evolution, it will begin to incorporate Aboriginal knowledge and perspectives – reflecting our Statement of Commitment to Aboriginal people – because through their 65,000 years of stewardship of this land they have deep insights that can inform our response.

It is sobering to realise that the environmental harm caused by climate change will continue to escalate until emissions effectively reach net zero levels, which sets huge challenges to reduce carbon emissions for this generation and those that follow. The risks of not acting are unequivocal and have already started to appear.

We have all experienced the early impacts of climate change, mostly through the weather extremes that bring about unprecedented floods, fires, droughts and heatwaves. At the EPA, we see the consequences of these extremes up close, leading the clean-up and environmental recovery in the aftermath of the extreme weather disasters that are increasingly linked to our changing climate. For our people in the field, it feels very personal.

Climate scientists say these events are some of the first symptoms of climate change – all occurring with average global warming of just 0.8°C. For the NSW EPA, they demonstrate why the ambitious actions in our policy and action plan must be implemented.

This document recognises the threats to our environment and the ambitions we must turn into material action to meet the increasing challenges posed to our communities and industries by climate change.

It also acknowledges the substantial progress and innovation occurring as businesses and individuals increasingly adopt sustainable and regenerative practices.

This plan details the staged and collaborative approach we will take, acknowledging that we can only achieve these goals if we work together. Our approach will focus on ensuring business is connected to best-practice frameworks for both mitigation and adaptation, with the necessary support to ensure adjustments over time are cost-effective and enable new sources of sustainable growth.

We will set clear expectations for the industries we regulate, so they contribute to the whole NSW economy achieving a 50% and 70% reduction in emissions by 2030 and 2035 respectively (compared to 2005 levels), and net zero emissions by 2050. Our policy and action plan map how we will work with our regulated community to build resilience to climate change risks, support cost-effective decarbonisation, and implement best practice. Our staged approach also ensures our actions will be deliberate, well informed, and complement other government and industry actions on climate change.

With change of this scale there also comes great opportunity for prosperity. Australia can harness a new wave of industrial activity including hydrogen, green steel and metals, green ammonia, clean energy, natural capital, regenerative agriculture and so much more.

Together, the NSW Government and the EPA will help communities and industries grasp these opportunities with both hands as we transition to a prosperous, resilient and sustainable future.

A handwritten signature in black ink that reads "Tony Chappel". The signature is stylized and cursive.

Tony Chappel
Chief Executive Officer

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1. Introduction

The EPA is committed to strengthening its regulatory response to climate change.

Without substantial action, climate change poses a major threat to humanity and most living systems on Earth. We can already see its effects and they are predicted to worsen over time.

Increasingly, communities across Australia and the globe are demanding that governments take effective and meaningful climate change action. Our NSW community expects us, as the State's primary environmental regulator, to strengthen our climate change approach.

We are increasingly being called on to respond to the acute and chronic impacts of climate change, including more frequent, widespread and devastating severe weather events. More than ever before we are coordinating major clean-up and recovery programs to help significantly affected communities get back on their feet and deal with the impacts of these concurrent, compounding and consecutive disasters and significant pollution incidents.

We are shifting our focus into helping government, our regulated community (especially our licensees), Aboriginal communities and the community more broadly to minimise and manage the impacts of climate change (including exposure to climate risks) and be better prepared for the next series of climate-induced events and incidents.

In doing so, we call on businesses and communities across NSW to work with us as we strengthen our climate change approaches. How impacted the people of NSW are by the effects of climate change depends on how quickly emissions can be reduced and by how much, and how prepared the State is for the predicted climate changes.

We recognise the role we have to play in this whole-of-State effort. This policy document outlines our role in environmental regulation more broadly and how we are expanding our focus to more explicitly regulate the causes and consequences of climate change, within our regulatory remit.



2. Policy context

The causes and consequences of climate change in NSW

The build-up of greenhouse gases (see **Box 1** below) in the atmosphere since the beginning of the industrial age is causing our climate to change, with potentially serious consequences. These changes are now being acutely felt.

Our **NSW State of the Environment (SoE) 2021** report (EPA 2021d) describes the effects of carbon emissions on our climate, as well as how climate change already affects, or will affect, all aspects of our environment.

Key findings in our SoE 2021 report include:

- NSW greenhouse gas emissions in 2018–19 were 136.6 million tonnes (Mt) of carbon dioxide equivalent (CO₂-e), which is 17% lower than in 2005.
- Fuel production and combustion in NSW accounted for almost 80% of NSW emissions in 2018–19.

- The effects of climate change, especially increases in temperature, are already being felt and will become more intense in the future.
- In NSW, the mean temperature is about 1.4°C higher than in 1910, with 2018 and 2019 being the warmest years on record. Other observed changes include increased seasonal variability in rainfall and increases in some extreme weather events such as heatwaves.
- The changes to climate are expected to become more severe over time. They include more extreme weather events, increasing coastal erosion and inundation, and greater impacts on infrastructure, human health and wellbeing.

Appendix A provides a summary of the causes and consequences of climate change in NSW, as described in our SoE 2021 report under the **Climate and Air** theme.





Box 1 Greenhouse gases and other climate pollutants

Burning and extracting fossil fuels and certain chemical processes release greenhouse gases and other climate pollutants which build up in the atmosphere. This causes extra heat to be trapped by the atmosphere and contributes to global warming.

Carbon dioxide (CO₂) is the primary greenhouse gas emitted by human activities and makes up almost 70% of emissions in NSW. Other greenhouse gases of concern include **nitrous oxide** (N₂O), **methane** (CH₄), **ozone** (O₃) and some **synthetic gases**. Greenhouse gas emission estimates are expressed as 'carbon dioxide equivalent' (CO₂-e) to account for the different global warming potentials of each gas compared to CO₂.

Short-lived climate pollutants (SLCPs) are a group of greenhouse gases and air pollutants that have relatively short atmospheric lifetimes compared to CO₂. SLCPs have a high global warming potential: molecule for molecule, they warm the Earth faster than CO₂. The main SLCPs are **black carbon**, **methane**, **ground-level ozone** and **hydrofluorocarbons**.

Black carbon refers to small airborne particles (PM_{2.5}) emitted by combustion processes. These particles strongly absorb sunlight, generating heat in the atmosphere. PM_{2.5} is also a significant air pollutant, contributing to respiratory and cardiovascular illnesses.

Ground-level ozone generally forms through chemical reactions in the atmosphere involving carbon monoxide (CO), **nitrogen oxides** (NOx) and **volatile organic compounds** (VOCs), in the presence of sunlight. In addition to being a SLCP, **ground-level ozone** is an air pollutant, with significant health impacts (it is the main ingredient in smog). Managing emissions of CO, NOx and VOCs helps to reduce the formation of ground-level ozone.

This policy and our action plan apply to **greenhouse gases** and related **short-lived climate pollutants** (SLCPs) emitted by human activities (see **Box 1** above). While we mainly refer to actions for reducing greenhouse gases, many of these actions also provide an opportunity to reduce SLCPs. We'll be looking to reduce both groups of climate pollutants. This has a co-benefit of protecting local and regional air quality as well.



NSW Government responses to climate change

Combating climate change requires a coordinated, multi-level government and agency response. The primary architecture governing this effort internationally is the **United Nations Framework Convention on Climate Change** and the **Paris Agreement**. Australia is a party to both initiatives.

The NSW Government has endorsed the Paris Agreement and is taking decisive and responsible action to reduce greenhouse gas emissions and secure the State's long-term economic prosperity and prepare NSW to manage the impacts of a changing climate.

Key documents – NSW framework and plan

The *NSW Climate Change Policy Framework* (OEI 2016) sets out the NSW Government's long-term goal to achieve net zero emissions by 2050 and to make NSW more resilient and adapted to a changing climate.

The *Net Zero Plan Stage 1: 2020–2030* (DPIE 2020) is the foundation for NSW's action on climate change. It outlines the NSW Government's plan to grow the economy, create jobs and reduce emissions over the next decade.

The *Net Zero Plan Stage 1: 2020–2030 Implementation Update* (DPIE 2021a) and the *Net Zero Plan Implementation Update 2022* (OECC 2022) provide an update on the key achievements of the NSW Government under the Net Zero Plan, and commit NSW to reducing emissions by 50% below 2005 levels by 2030, and 70% below 2005 levels by 2035.

The *NSW Climate Change Adaptation Strategy* (NSW Government 2022) sets out the NSW Government's strategic approach for managing the impacts of climate change on the State.

The *NSW Waste and Sustainable Materials Strategy 2041* (DPIE 2021c) sets out how NSW will transition to a circular economy over the next 20 years, including key reforms for reducing greenhouse gas emissions from materials (embedded carbon) and the waste sector.

Further detail about the various NSW Government responses to climate change can be found in our SoE 2021 report, under the [Climate and Air](#) theme.

Key documents – EPA

We adopt and support the delivery of the NSW Government's **Climate Change Policy Framework**, including the:

- **Net Zero Plan Stage 1: 2020–2030**
- **Net Zero Plan Stage 1: 2020–2030 Implementation Update**
- **Net Zero Plan Implementation Update 2022**
- **Climate Change Adaptation Strategy**
- **Waste and Sustainable Materials Strategy.**

Our climate change policy and the associated action plan (*Climate Change Action Plan 2023–26*) complement, support and build on the foundations set in those documents.

Our **Strategic Plan 2021–24** identifies **climate change** and **ecologically sustainable development** as two of our key focus areas.

We are committed to:

- taking action to reduce greenhouse gas emissions, mitigate climate change impacts and build greater environmental and community resilience aligned with the principles in the NSW Net Zero Plan
- championing sustainable approaches to mitigate the cumulative impacts of industry on local communities and environments.

Our climate change policy and the associated action plan help us deliver on these strategic commitments.

Our **Regulatory Strategy 2021–24** (EPA 2021b) outlines our purpose, guiding principles and approach to improving outcomes for the environment and human health. The strategy identifies climate change as one of our key regulatory challenges.

Our **Regulatory Policy** (EPA 2021a) explains how we make decisions and identify appropriate action to respond to environmental or human health issues. Our climate change policy and the associated action plan are consistent with our Regulatory Policy. **Appendix B** outlines how we have considered our decision-making principles and relevant decision factors in developing our regulatory response to climate change.

Our **Waste Delivery Plan** (EPA 2021e) outlines the actions we'll take to reduce the harmful impact of waste and drive behaviours that create a circular economy, including actions to deliver on the **NSW Waste and Sustainable Materials Strategy 2041**. Our Waste Delivery Plan includes actions to reduce carbon emissions and building waste sector resilience to climate change.

We prepare the *NSW State of the Environment* report every three years, to provide a snapshot in time of the status of the main environmental issues facing NSW. Our SoE 2021 report describes the causes and consequences of climate change in NSW and provides information about the NSW Government's response. (**Appendix A** of this policy document gives a summary of the causes and consequences of climate change.)

The EPA's role

The EPA is the primary environmental regulator for NSW. As such, we are an active government partner on climate change policy, regulation and innovation.

We've always regulated some of the causes and consequences of climate change. For example, we regulate certain air emissions (e.g. methane, black carbon) that contribute to climate change (i.e. these are **short-lived climate pollutants**), although we have focused mainly on how those emissions affect the environment and human

health at a local and regional level. Under the State's emergency management arrangements we also play an important role in responding to the environmental impacts of climate-induced incidents, emergencies and disasters, taking part in response and recovery activities.

We're now expanding our focus, to more explicitly regulate the causes and consequences of climate change in NSW, within our regulatory remit. Our regulatory response to climate change is aligned with our broader approach to regulation (see **Box 2** and **Figure 1** below).

We regulate activities that release greenhouse gas emissions and are exposed to climate-related risks. **Figure 2** below provides an overview of the main sources of greenhouse gas emissions in NSW and a description of the relative amount covered by our regulatory remit. **Appendix A** provides more detail on the sources, levels and trends in greenhouse gas emissions and black carbon in NSW.

There are considerable opportunities to improve environmental and human health outcomes as we work with our regulated community to manage the causes and consequences of climate change. Our existing environmental legislation and environment protection licences provide a robust framework through which we can support our regulated community to reduce greenhouse gas emissions and build greater resilience to the consequences of climate change.





Box 2 What is 'regulation' and how does the EPA regulate?

Our **environment protection legislation** establishes a strong basis for environmental regulation that is outcomes-focused, proactive and contains appropriate compliance mechanisms. We also address challenging issues with innovative and effective tools that combine enforcement and education, business and community partnerships, and economic mechanisms.

We're responsible for regulating a broad range of activities and the environmental or human health risks associated with (for instance):

- air emissions
- noise
- waste
- water discharges
- native forestry
- contaminated land
- dangerous goods
- hazardous materials
- chemicals
- radiation
- pesticides
- coal seam gas.

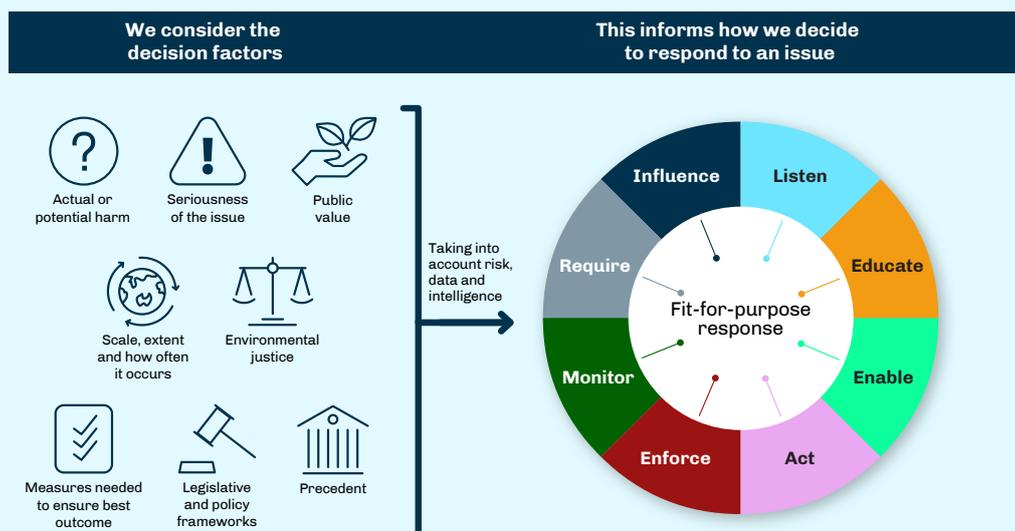
These responsibilities extend to regulating the causes and consequences of climate change, within our regulatory remit.

Many (but not all) of the activities we regulate have the potential to significantly impact the environment and so require an **environment protection licence** from the EPA to operate (see **Glossary**). Most of our licensees are environment protection licensees but we also issue other types of licences for occupations or activities as required by the legislation. In this policy document (and in our action plan), when we say 'licence', we mean 'environment protection licence' unless we say otherwise.

Regulation refers to the functions we perform to protect, enhance and restore the environment, reduce the risks to human health and prevent degradation of the environment. We have a balanced **regulatory approach** with eight elements: influence, listen, educate, enable, act, enforce, monitor, require (see **Figure 1** below).

Our **regulatory responses** to environmental and human health issues are informed, fit for purpose and may result in more than one tool being used or action being taken. When choosing an appropriate regulatory response, we are guided by our decision-making principles. We also consider the relevant decision factors and take into account risk, data and intelligence (see **Figure 1** below). By focusing on the greatest risks to human health and the environment, we apply a **risk-based approach** to regulation.

Figure 1 The EPA's regulatory response to environmental or human health issues



We work with our **regulatory partners** in complementary ways as co-regulators. These are other State and local government regulators including the Department of Planning and Environment, NSW Health, SafeWork NSW, Transport for NSW, the Department of Regional NSW and local councils.

Our regulated community is the people, businesses and industries we regulate under our environment protection legislation.

Source: EPA Regulatory Strategy (EPA 2021b) and EPA Regulatory Policy (EPA 2021a).

Figure 2 NSW greenhouse gas emissions (2018–19) and description of coverage by the EPA's regulatory remit

Sector *		Description	Total NSW emissions (% of total NSW emissions)**	Activities in this sector that are covered by the EPA's regulatory remit
	Stationary energy (electricity generation)	Emissions from the combustion of fossil fuels for electricity generation	52 Mt (38%)	The EPA is responsible for regulating larger electricity generation activities that generate almost all of these emissions (e.g. coal-fired power stations). Local councils are generally responsible for regulating smaller activities, which typically have much lower emissions.
	Transport	Includes fossil fuel combustion emissions for use in transport activities (e.g. on-road vehicles, rail, domestic aviation and domestic shipping)	28 Mt (20%)	While some operators that the EPA regulates use on-road vehicles or rail rolling stock, emissions from these account for a very small proportion of total transport sector emissions.
	Agriculture	Includes emissions of methane and nitrous oxide from livestock, crops, and agricultural and forest soils	16 Mt (12%)	Most agricultural emissions are methane emissions from ruminant animals (mainly cattle and sheep). These animals are predominantly kept on grazing land, which is not within the EPA's remit. Some of these emissions are from livestock-intensive activities (e.g. feedlots), which the EPA does regulate.
	Stationary energy (excluding electricity generation)	Emissions from on-site fossil fuel combustion (e.g. to run boilers and furnaces) used in manufacturing and other activities	15 Mt (11%)	The EPA is responsible for regulating larger industrial activities that generate most of these emissions (e.g. metallurgy). Local councils generally regulate smaller premises that use on-site stationary energy (e.g. some commercial, residential and smaller industrial premises).
	Fugitive emissions	Emissions from the extraction and distribution of coal and natural gas	13 Mt (9%)	In NSW fugitive emissions are mainly from coal and gas extraction activities, which are almost all regulated by the EPA (e.g. coal mines).
	Industrial processes and product use	Emissions from chemical and/or physical transformation of materials, and consumption of synthetic greenhouse gases	13 Mt (9%)	The EPA is responsible for regulating larger industrial premises that generate most of these emissions (e.g. chemical production). Local councils are generally responsible for regulating smaller activities; however, these typically have much lower emissions.
	Waste	Emissions due to waste disposal, treatment and processing, including domestic and industrial wastewater	5 Mt (4%)	Almost all waste activities are regulated by the EPA (e.g. landfills, sewage treatment plants).
	Land use, land-use change and forestry	Emissions due to land use, land-use change and forestry can either be an emission source (positive emissions) or sink (negative emissions)	-5 Mt (-3%)	EPA has a role in regulating some forestry activities (e.g. native forestry).

* Sectors are based on the UNFCCC (United Nations Framework Convention on Climate Change) classification system.

** Total greenhouse gas emissions in NSW (2018–19). Data from SoE 2021 report (EPA 2021d), Spotlight figure 5, which uses data from (DISER 2021).

Our statutory objectives and duty and how they relate to climate change

Statutory objectives

Section 6 of the *Protection of the Environment Administration Act 1991* (POEA Act) outlines the EPA's **statutory objectives** to protect the environment and human health. The key elements are:

- to protect, restore and enhance the quality of the environment in NSW, having regard to the need to maintain **ecologically sustainable development** (see **Glossary**)
- to reduce the risks to human health and prevent the degradation of the environment.

These objectives extend to protecting the environment and human health from climate change.

We are required to consider the EPA's statutory objectives when exercising our licensing functions under the *Protection of the Environment Operations Act 1997* (POEO Act). See **Box 3** below.

Statutory duty

Section 9 of the POEA Act imposes a **statutory duty** on the EPA to develop environmental quality objectives, guidelines and policies to ensure environment protection. This includes protection of the environment from climate change.

This policy addresses our duty under section 9 of the POEA Act.



Box 3 Matters the EPA must consider when making licensing decisions

Section 45 of the POEO Act sets out a range of matters the EPA must consider, where relevant, when exercising its licensing functions under Chapter 3 of the POEO Act. Among other matters, this section requires the EPA to consider:

- the objectives of the EPA (described above)
- the pollution caused (or likely to be caused) and the likely environmental impact
- practical measures for preventing, controlling, abating or mitigating pollution
- practical measures for protecting the environment from harm as a result of that pollution.

The EPA's obligation to consider matters listed under section 45 extends to our regulatory decisions relating to climate change.

Purpose of this policy

The main purpose of this policy is to address both:

- our statutory objectives to protect, restore and enhance the quality of the environment in NSW, and to reduce the risks to human health and prevent the degradation of the environment, under section 6(1) of the POEA Act
- our statutory duty to develop environmental quality objectives, guidelines and policies to ensure environment protection from climate change, under section 9(1)(a) of the POEA Act.

Our climate change action plan

This policy will be delivered through an accompanying action plan (*Climate Change Action Plan 2023–26*). The plan sets out:

- the specific actions we'll take over the next three years
- the stronger regulatory action we'll consider over the medium to longer term, where an increased regulatory response may be required to support the NSW Government's climate change commitments and policies, including achieving net zero emissions in NSW by 2050.

This policy should be read in conjunction with the action plan.

Our objectives

Through this policy and our action plan, the EPA adopts, supports and seeks to complement the NSW Government's overarching climate change objectives. Those objectives are:

- to maximise the economic, social and environmental wellbeing of NSW in the context of a changing climate and current and emerging international and national policy settings and actions to address climate change

- to reduce greenhouse gas emissions in line with the NSW Government's **net zero targets**, which are
 - a 50% reduction in emissions by 2030, compared to 2005 levels
 - a 70% reduction in emissions by 2035, compared to 2005 levels
 - net zero emissions by 2050
- to make NSW more resilient and adapted to a changing climate.

Reporting and review

We'll report on our progress towards achieving the climate change outcomes we've set out in our *Strategic Plan* (EPA 2021c); for example, by reporting our progress against our climate change action plan in our *EPA Annual Report*.

We'll review our climate change policy and action plan in 2026, in line with the reporting cycles for our strategic planning and *NSW State of the Environment* reports. However, we may adjust the action plan and policy earlier, if required.



3. Our policy: Strengthening our climate change response

Our general policies

- We adopt and support the delivery of the NSW Government's *Climate Change Policy Framework* (OEH 2016), including the:
 - *Net Zero Plan Stage 1: 2020–2030* (DPIE 2020)
 - *Net Zero Plan Stage 1: 2020–2030 Implementation Update* (DPIE 2021a)
 - *Net Zero Plan Implementation Update 2022* (OECC 2022)
 - *Climate Change Adaptation Strategy* (NSW Government 2022)
 - *Waste and Sustainable Materials Strategy* (DPIE 2021c).
- We complement the action our government partners are taking to address climate change, so that together we can achieve the best possible outcomes for the environment and human health.
- We identify how actions to address climate change can achieve broad benefits for the environment, human health and Aboriginal cultural values.
- We listen to our regulated community (including our environment protection licensees) and regulatory partners so that we understand the nature of the climate change actions they are already taking.
- Where support is needed, we work with our regulated community and regulatory partners to build their own understanding of climate change mitigation and adaptation, and their capacity to respond.
- We ensure our policies, actions and approaches are well-informed, fit for purpose, fair, transparent, and consistent with environmental justice principles.

Key pillars of our policy

1. **Inform and plan:** continually improving as we listen, provide support and report
2. **Mitigate:** reducing greenhouse gas emissions
3. **Adapt:** adapting and building resilience to a changing climate

1



Inform and plan: continually improving as we listen, provide support and report

Reliable, high-quality information and planning are critical for an effective climate change response. 'Information and planning' includes determining baselines, assessing risks, promoting good practices, measuring success, reporting in a transparent way, and improving in response to new evidence, technologies, government policies and stakeholder feedback.

- We identify emerging issues, trends, risks and opportunities related to climate change.
- We monitor and report on the state of the NSW environment (including the climate) and on the effectiveness of the NSW Government's climate change response, in our *NSW State of the Environment* reports.
- We consider climate change when we make our regulatory decisions, using the best available evidence and knowledge.
- We focus our regulatory effort by listening to our stakeholders, considering current NSW Government policies and strategies, analysing the best available data, and considering current and best practice.
- We consult, collaborate and partner with other NSW Government agencies and with other Australian jurisdictions on regulatory responses to climate change, to share knowledge and align approaches where appropriate.
- We listen to Aboriginal people, young people, scientists, our regulated community, businesses, local communities and other key stakeholders as we implement, review and update our climate change response.

2



Mitigate: reducing greenhouse gas emissions

Climate change mitigation is about taking action to reduce the rate of climate change. It includes actions that limit or prevent greenhouse gas emissions and activities that remove these gases from the atmosphere.

- We'll develop feasible, evidence-based greenhouse gas emission reduction targets for key industry sectors we license (or parts of those sectors), including appropriate pathways. These targets will help guide the EPA's regulatory efforts and contribute to the broader NSW net zero targets.
- We'll progressively place feasible, evidence-based greenhouse gas emission limits and other requirements on licences for key licensed industry sectors, once we have set appropriate targets and identified or developed guidance to support these requirements being set consistently.

- We support our regulatory partners to understand and consider greenhouse gas emissions and climate change mitigation as they make land-use planning decisions.
- We expect and support our regulated community, especially our licensees, to understand their greenhouse gas emissions and make fair and reasonable emission reductions to help NSW meet its net zero targets.
- We encourage and support the broader community and businesses in general to minimise greenhouse gas emissions and increase carbon sinks in NSW, by using education, behavioural change programs and other innovative approaches.
- We encourage and support our regulated community to engage with innovation programs and initiatives, including those of the NSW Government, to reduce emissions and transition to a decarbonised economy, identifying barriers to innovation.
- We lead by example and are committed to becoming a carbon-neutral organisation by 2030.

3



Adapt: adapting and building resilience to a changing climate

Climate change adaptation is about adjusting to the actual or expected effects of climate change. Adaptation plays a key role in reducing exposure and vulnerability to climate change. Adaptation enables communities, business and the economy to plan for, and recover more quickly and easily from, the acute and chronic impacts of climate change.

- We support our regulatory partners to understand and consider climate change risks and adaptation as they make land-use planning decisions.
- We expect and support our regulated community to understand the impacts of

climate change on their activities and to reduce their exposure to climate risks in a way that contributes to the State's goal of making NSW more resilient and adapted to a changing climate.

- We encourage and support the broader community and businesses in general to adapt and build resilience to the acute and chronic impacts of climate change in NSW, through education, behavioural change programs and other, innovative approaches.
- We assist NSW communities, in partnership with other agencies, to be more prepared for climate-change-related incidents, emergencies and disasters such as bushfires and floods, and help communities recover from these events when they occur.
- We assess and effectively manage the risk of climate change on our own operations.

4. We're committed to engaging with our stakeholders

The EPA is committed to listening to the people of NSW. Our stakeholders are expressing significant concern about climate change. We're committed to effective engagement as we implement and improve our climate change response. Expanding on this, we're committed to engaging with Aboriginal people, young people, relevant local communities (including disaster-affected communities), our regulated community, regulatory partners (including local government) and other stakeholders as we implement, refine and improve our climate change response.

Our regulated community, including our licensees

We're committed to working with our regulated community, especially our environment protection licensees ('licensees'), to help ensure they are actively contributing to the State's net zero targets and the goal of making NSW more resilient and adapted to a changing climate.

We recognise that many of our licensees are already forging ahead of mandated requirements, in response to expectations from shareholders, financial institutions, customers and the broader community. Equally, we acknowledge that many of our licensees are already disclosing and addressing their exposure to climate-related risks and investing resources to reduce greenhouse gas emissions, as this makes good business sense.

We'll listen to our licensees to understand their climate approaches, and provide support to enable change where this is needed.

The business case for action on climate change is compelling

Deloitte CxO Sustainability Report – Australia (2022)

In this report Deloitte found that '[m]ost executives believe the world is at a tipping point for responding to climate change' and '[t]he business case for change is compelling and broadly accepted – Australia stands to lose \$3.4 trillion by 2070 if we don't act fast, but could gain \$680 billion with rapid, focused action' (Deloitte 2022).

CDP report: Are companies ready for climate change? (2019)

In 2018, the Carbon Disclosure Project (CDP) analysed 500 of the world's biggest companies by market capitalisation (G500).¹ The CDP found that 215 of these companies reported facing a collective \$970 billion in risks related to climate change, and that over half of these risks were likely to materialise in the next five years. Two hundred and twenty-five of these companies also reported climate-related opportunities representing potential financial impacts totalling over US\$2.1 trillion dollars (CDP 2019).



¹ The CDP is a not-for-profit charity that runs the global disclosure system for investors, companies, cities, states and regions to allow them to manage their environmental impacts.

Young people

We're committed to the principles of environmental justice and intergenerational equity in our climate change response. Young people (and generations to come) will be affected more by climate change than older Australians alive today. Young people also tend to report higher levels of concern and anxiety over climate change (Wu et al. 2020). We must give them opportunities to influence our actions on climate change.

Aboriginal people

Aboriginal people have been able to live effectively with changing climates over tens of thousands of years. Knowledge handed down from generation to generation has given Aboriginal people across Australia an intimate and detailed knowledge of their respective Country and its climate. This knowledge has also resulted in effective understanding and management of place (EPA 2021d).

Indigenous people across the globe are particularly vulnerable to climate change and disproportionately affected by it.

For Aboriginal people in NSW, the impacts of climate change are compounded by disconnection from Country and cultures; the loss of access to, and damage to, land, water, food, natural resources and culturally significant places; and socio-cultural challenges including poverty, land dispossession and poor housing.

We recognise that connection to Country is integral to Aboriginal people's wellbeing and cultural practices. As we build our climate change response, we're also building our capacity to engage with Aboriginal people and communities on this important issue, so that we can support Aboriginal perspectives about caring for Country in sustainable and culturally appropriate ways.

We aim to ensure Aboriginal knowledge and perspectives are taken into account and incorporated within our work and in important environmental issues, by building relationships with communities and working to maintain these relationships for the long term (EPA 2021c).

Consistent with the principles of environmental justice, we're committed to including Aboriginal people socially, culturally and economically in our climate change response, such as by incorporating Aboriginal ecological and climate knowledge. This will ensure benefits are shared and that cultural practices can continue.

Through our climate-related work and beyond, we will seek to ensure we are assisting the NSW Government to contribute to the priorities of the **National Agreement on Closing the Gap** (and related NSW implementation plans) in a meaningful way.

Our government partners

We'll continue to work closely with local government and other regulatory partners (see **Glossary**) and NSW Government agencies more broadly on regulatory responses to climate change, as we implement and improve our regulatory response and determine if stronger regulatory action is needed. This includes engaging with agencies with climate change expertise and those that conduct related research and support the businesses we regulate.

Our key partner agencies on climate change include the Office of Energy and Climate Change (NSW Treasury), the Department of Planning and Environment, the NSW Reconstruction Authority, the Department of Regional NSW, Transport for NSW and Investment NSW.

Other jurisdictions

In developing our climate change policy and action plan, we've considered the climate change approaches of other countries and other Australian jurisdictions. We've collaborated and will continue to collaborate with other jurisdictions as our approach evolves.

Glossary

Term	Definition
Acute climate change impacts or events	<p>Acute climate change impacts are event-driven: they include increased severity of extreme weather events such as heatwaves, floods or storms. These impacts are also sometimes called acute events, hazards or shocks (DPIE 2021b; NSW Government 2022).</p> <p>See also: chronic climate change impacts.</p>
Black carbon	<p>Black carbon refers to small airborne particles emitted by combustion processes. Black carbon is both an air pollutant and a short-lived climate pollutant. Black carbon emissions have been linked to both climate warming and adverse health effects, including respiratory and cardiovascular illnesses (EPA 2021d; CARB 2022; CCES 2022).</p>
Carbon sink or greenhouse gas sink	<p>Carbon (or greenhouse gas) sink means a reservoir (natural or human, in soil, ocean, and plants) where a greenhouse gas, an aerosol or a precursor of a greenhouse gas is stored (IPCC 2018).</p>
Chronic climate change impacts or stressors	<p>Chronic climate change impacts result from longer-term and cumulative changes in weather patterns and climate-related trends. Chronic impacts are sometimes called stressors or slow-onset events. Examples include sustained high temperatures, sustained low or high rainfall and sea level rise. Chronic impacts can lead to and amplify acute impacts (event-based) (DPIE 2021b; NSW Government 2022).</p> <p>See also: acute impacts of climate change.</p>
Climate	<p>Climate means the average weather that a location experiences over many years, even thousands of years. Key variables include temperature, rainfall and wind (CSIRO 2018).</p>
Climate change	<p>Climate change means changes in the climate (the average weather) that persist for an extended period of time, typically decades or longer. Climate change therefore occurs in addition to or on top of variability from year to year (CSIRO 2018).</p>
Climate change adaptation	<p>Climate change adaptation means adjustment to the actual or expected effects of climate change. Adaptation plays a key role in reducing exposure and vulnerability to climate change, and can be proactive, reactive, incremental or transformational (IPCC 2022a).</p>
Climate change mitigation	<p>Climate change mitigation means actions that reduce the rate of climate change. This includes actions that limit or prevent greenhouse gas emissions and activities that remove these gases from the atmosphere (IPCC 2022b).</p>
Climate resilience	<p>Climate resilience means the capacity of systems (including social, economic, engineered, natural and ecosystems) to cope with a hazardous event, trend or disturbance. Coping means responding in ways that maintain the essential function, identity and structure of a system (as well as biodiversity in the case of ecosystems) (IPCC 2022a).</p>

Term	Definition
Climate risk or climate change risk or climate-related risks	Climate risk is when a hazard creates the potential for negative consequences due to the exposure and vulnerability of human or ecological systems. These consequences can include impacts on lives, livelihoods, health and wellbeing, economic, sociocultural assets and investments, infrastructure, services (including ecosystem services), ecosystems and species (IPCC 2021c).
CO₂-equivalent (CO₂-e) emission	CO₂-equivalent (CO₂-e) emission means the amount of carbon dioxide (CO ₂) emission that would cause the same integrated radiative forcing or temperature change, over a given time horizon, as an emitted amount of a greenhouse gas or a mixture of greenhouse gases (IPCC 2018).
Co-benefits of climate change action	The co-benefits of climate change action include the benefits for the local environment and human health as a result of (mitigation/adaptation) actions that are targeted at addressing global climate change, such as improved air, water and soil quality, biodiversity and ecosystem services, the availability of natural resources, and safety (Hamilton & Akbar 2010). There are also co-benefits for the protection of Country and Aboriginal cultural values, which are essential to the culture and wellbeing of Aboriginal people.
Decarbonisation	Decarbonisation is the process by which countries, individuals or other entities aim to achieve zero fossil carbon existence. It typically refers to a reduction of the carbon emissions associated with electricity, industry and transport (IPCC 2018).
Ecologically sustainable development	Ecologically sustainable development (ESD) requires the effective integration of social, economic and environmental considerations in decision-making processes. A full definition is in section 6(2) of the <i>Protection of the Environment Administration Act 1991</i> . The principles of ESD are well established and are enshrined in legislation in NSW, Australia and many other jurisdictions.
Ecosystem services	Ecosystem services are the benefits provided to humans through the transformations of resources (or environmental assets, including land, water, vegetation and atmosphere) into a flow of essential goods and services e.g. clean air, water and food (Costanza et al. 1997).
Environmental justice	Environmental justice means the fair treatment and meaningful involvement of all people regardless of age, ethnic background, socio-economic background and status with respect to the development, implementation and enforcement of environmental legislation, policies and actions [adapted from: (US EPA, 2015)]. Environmental justice principles include whether there will be an impact on disadvantaged communities or vulnerable people because of an environmental or human health issue or a non-compliance (EPA 2021a).

Term	Definition
Environment protection legislation (NSW)	NSW environment protection legislation refers to the suite of legislation that the EPA has responsibilities, functions and powers under. This includes (but is not limited to) the <i>Protection of the Environment Operations Act 1997</i> (POEO Act), which is the key piece of legislation for protecting the environment in NSW. See our Legislation and compliance webpage for a full list of the legislation we administer.
Environment protection licence ('licence') and environment protection licensee ('licensee')	<p>Environment protection licences ('licences') are a key measure for controlling the localised, cumulative and acute impacts of pollution in NSW. The <i>Protection of the Environment Operations Act 1997</i> (POEO Act) contains a list of activities that require a licence (in Schedule 1 of the POEO Act). Broadly, they are activities with potentially significant environmental impacts.</p> <p>An activity listed in Schedule 1 is referred to as a 'scheduled activity'. The EPA issues these licences and is the appropriate regulatory authority (ARA) for all scheduled activities in NSW.</p>
Greenhouse gases	Greenhouse gases are gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of radiation emitted by the Earth's surface, by the atmosphere itself, and by clouds. This property causes the greenhouse effect. Water vapour (H ₂ O), carbon dioxide (CO ₂), nitrous oxide (N ₂ O), methane (CH ₄) and ozone (O ₃) are the primary greenhouse gases in the Earth's atmosphere. Human-made greenhouse gases include sulfur hexafluoride (SF ₆), hydrofluorocarbons (HFCs), chlorofluorocarbons (CFCs) and perfluorocarbons (PFCs) (IPCC 2021a). See also Box 1 .
Innovation	Innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations (COAG 2017).
Natural resources	Natural resources are the naturally occurring assets that provide useful benefits through the provision of raw materials and energy used in an economic activity (or that may provide such benefits one day) and that are subject primarily to quantitative depletion through human use. They are subdivided into four categories: mineral and energy resources, soil resources, water resources and biological resources (UN 1997).
Net zero emissions	Net zero emissions are achieved when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period (IPCC 2018).
Net zero targets (NSW Government)	<p>The NSW Government's net zero targets are:</p> <ul style="list-style-type: none"> • a 50% reduction in greenhouse gas emissions by 2030, compared to 2005 levels • a 70% reduction in greenhouse gas emissions by 2035, compared to 2005 levels, and • net zero greenhouse gas emissions by 2050. <p>(DPIE 2021a and OECC 2022)</p>

Term	Definition
Protection of the Environment Operations Act 1997 (POEO Act)	<p>The POEO Act is the key piece of environment protection legislation administered by the EPA. The object of the Act is to achieve the protection, restoration and enhancement of the quality of the NSW environment. The activities listed in Schedule 1 of the Act (broadly, activities with potentially significant environmental impacts) require an environment protection licence from the EPA.</p> <p>We're also responsible for a range of other NSW environment protection legislation.</p>
Regulation	<p>Regulation means the functions performed by the EPA to protect, enhance and restore the environment, reduce the risks to human health and prevent degradation of the environment. Regulation includes all the elements of the EPA's regulatory approach (see below) (EPA 2021a).</p>
Regulatory approach (the EPA's)	<p>The EPA's regulatory approach has eight elements: influence, listen, educate, enable, act, enforce, monitor and require. In everything we do we aim to assess the greatest risks and address the biggest impacts to human health and the environment. We focus our activities to achieve the best outcomes (EPA 2021b).</p>
Regulated community	<p>Regulated community means the people, businesses, industries and government organisations that are regulated by the EPA. Examples include: managers of contaminated sites; licensed industrial and agricultural premises (see environment protection licence); some forestry operators.</p> <p>In addition, under the POEO Act, the EPA is the appropriate regulatory authority (ARA) for all activities carried out by a public authority (e.g. activities managed by councils and other local authorities, NSW Government departments, State-owned corporations or Commonwealth Government departments).</p>
Regulatory partners	<p>Regulatory partners means other State and local government regulators who share our role in protecting the environment and human health, including the Department of Planning and the Environment, NSW Health, SafeWork NSW, Transport for NSW, Department of Regional NSW (including the Department of Primary Industries) and local councils. We work with our regulatory partners in complementary ways as co-regulators. We also influence their activities under environment protection legislation so they are informed by EPA expertise (EPA 2021b).</p>
Short-lived climate pollutants (SLCPs)	<p>Short-lived climate pollutants e.g. black carbon (air particles that are products of combustion), methane, ground-level ozone and hydrofluorocarbons have short atmospheric lifetimes but a high global warming potential. This means that, per molecule, they can warm the Earth faster than carbon dioxide (EPA 2021d; CARB 2022; CCES 2022).</p>

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Appendix A

Summary of the causes and consequences of climate change in NSW, from the EPA's *NSW State of the Environment 2021*

The EPA's **NSW State of the Environment (SoE) 2021** report (EPA 2021d) describes the causes and consequences of climate change in NSW. The [Climate and Air](#) theme describes the effects of carbon emissions on our climate, as well as how climate change already affects, or will affect, all aspects of our environment. **Aboriginal perspectives** on climate change are also discussed under this theme.

This Appendix provides a summary of the key information on the causes and consequences of climate change, contained in the Climate and Air theme of the SoE 2021 report.

About the SoE

Our **SoE 2021 report** provides a snapshot in time of the status of the main environmental issues facing NSW. The SoE report is published every three years and brings together information and data from across all NSW Government agencies with responsibility for managing the State's environmental assets.

The EPA is responsible for preparing SoE reports under section 10 of the *Protection of the Environment Administration Act 1991*. The SoE 2021 report was completed in December 2021 and has been tabled in Parliament. The next SoE report will be compiled in 2024.

The EPA prepares SoE reports every three years. The SoE 2021 report has been prepared as an interactive, online resource as well as a downloadable PDF. This means that elements of the SoE 2021 report can be updated as new information becomes available. For the most up-to-date SoE information, please refer to the EPA's **SoE webpage**.



Greenhouse gas emissions

The levels and trends in greenhouse gas emissions in NSW are described in the **Greenhouse Gas Emissions** topic of our SoE 2021 report. In addition, the **Net Zero Plan Stage 1: 2020–2030** topic provides an update on the status of the various initiatives under the NSW Government's Net Zero Plan and outlines how key sectors are being transformed and tracks their performance across the plan's priority areas. The following text is a brief summary of these topics.

Note: the latest available data on NSW greenhouse gas emissions can be accessed on the NSW **Net Zero Emissions Dashboard**, through the NSW Government's Sharing and Enabling Environmental Data (SEED) portal.

Burning and extracting fossil fuels and certain chemical processes release greenhouse gases which build up in the atmosphere, causing extra heat to be trapped by the atmosphere and resulting in global warming. Human activities are estimated to account for global warming of between 0.8°C and 1.3°C above pre-industrial levels. Unless deep reductions in greenhouse

gas emissions occur, global warming will exceed 1.5–2°C during the 21st century (IPCC 2021a).

Managing the amount of greenhouse gas emissions released and sequestered will be vital to the ongoing health of our State's ecosystems and viability of key economic sectors.

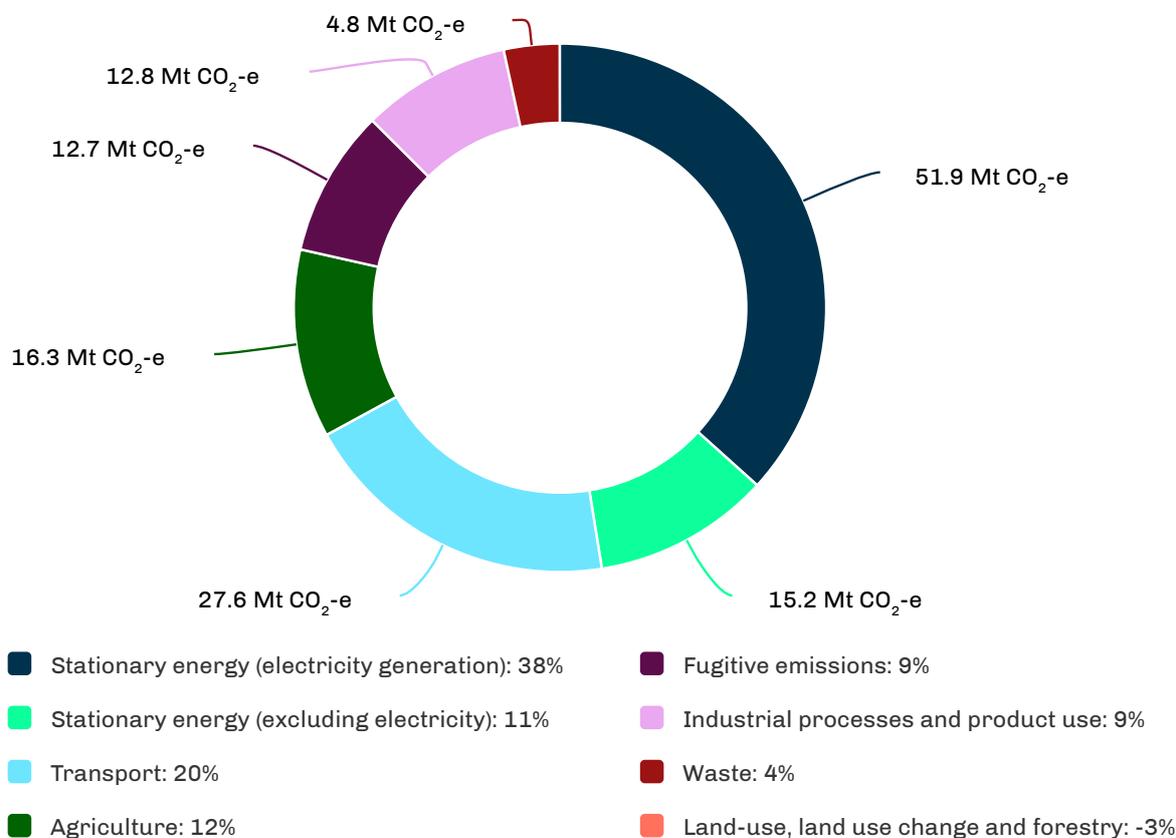
Although generating and using energy from non-renewable sources in NSW continues to produce greenhouse gas emissions, their levels are decreasing. With current policies implemented, emissions by 2030 are projected to be 47–52% lower than 2005 levels.

In 2018–19, NSW recorded net greenhouse gas emissions of 136.6 Mt of CO₂-e. Emissions peaked in 2007 and were 17% lower in 2019 than in 2005. Emissions have declined across most economic sectors, with the exception of transport, which has undergone an almost uninterrupted growth in emissions.

Using the estimation and reporting rules of the IPCC and the UNFCCC, the State's emissions predominantly arise from the energy sector, which incorporates stationary energy, and transport emissions, followed by agriculture, industrial processes and waste (see **Figure A1** below).



Figure A1 NSW greenhouse gas emissions by UNFCCC key categories 2018–19



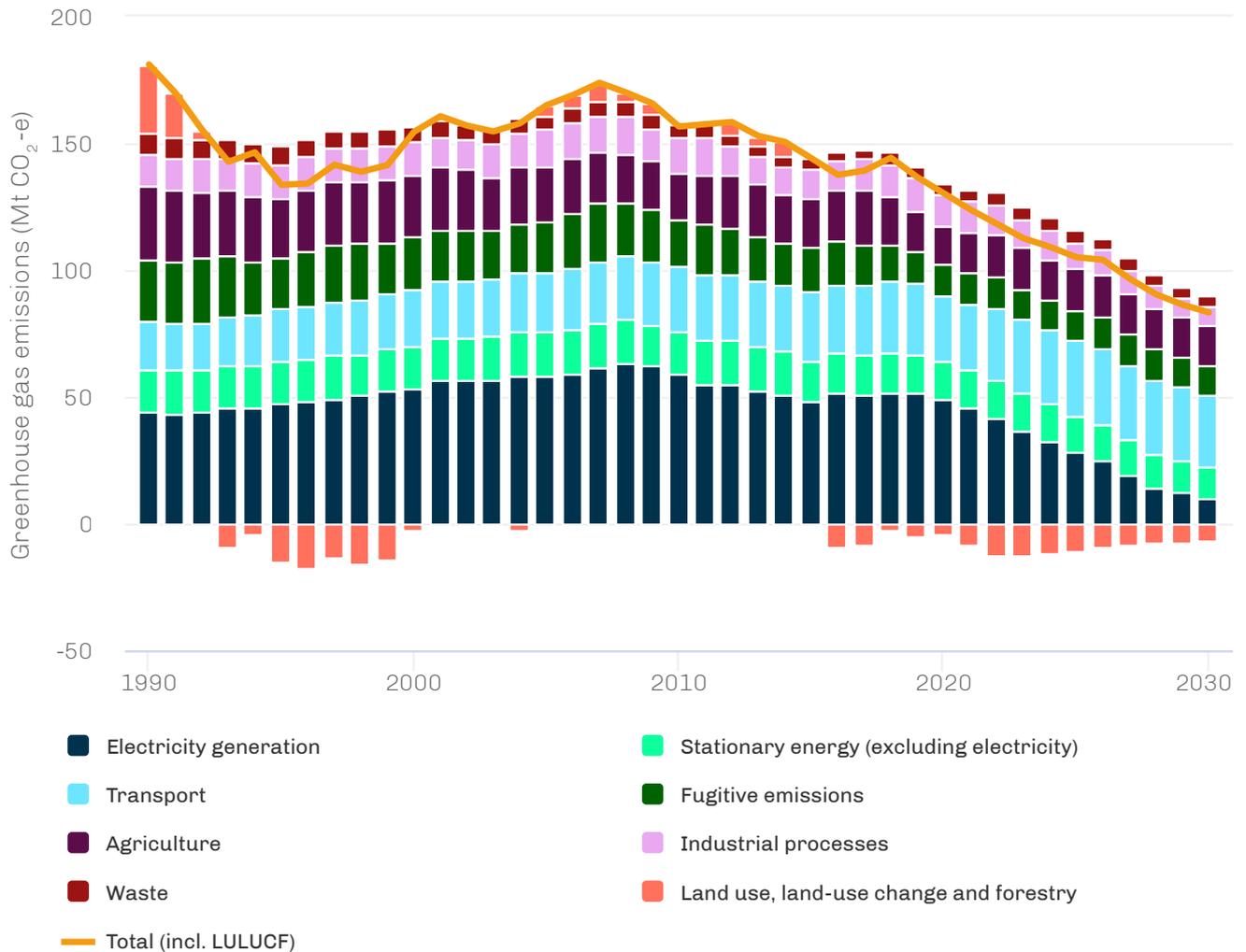
Source figure: SoE 2021, Spotlight figure 5, which uses data from (DISER 2021)

Fuel production and combustion in NSW accounted for almost 80% of NSW emissions in 2018–19. Of this, coal production and domestic coal combustion is the largest contributor to NSW emissions by fuel type (see Figure 5.4 in SoE 2021).

Emissions in NSW peaked in 2006–07 and have since fallen, mainly due to reductions in emissions from stationary energy (mostly electricity) and the land sector (see Figure A2 below).

The NSW Government has an objective to achieve a 50% reduction in emissions on 2005 levels by 2030, and to reach net zero emissions by 2050. The **Net Zero Plan Stage 1: 2020–2030** is the foundation for NSW action on climate change. Under current policy settings, NSW emissions in 2030 are projected to fall to 78.9–87.6 million tonnes CO₂-e, a 47–52% reduction from 2005 levels. This will put NSW on the path to achieving net zero emissions, with further action and investment in decarbonisation initiatives needed to reach net zero emissions by 2050.

Figure A2 Net NSW greenhouse gas emissions as inventoried (2005–19) and projected (2020–30) by UNFCCC key categories



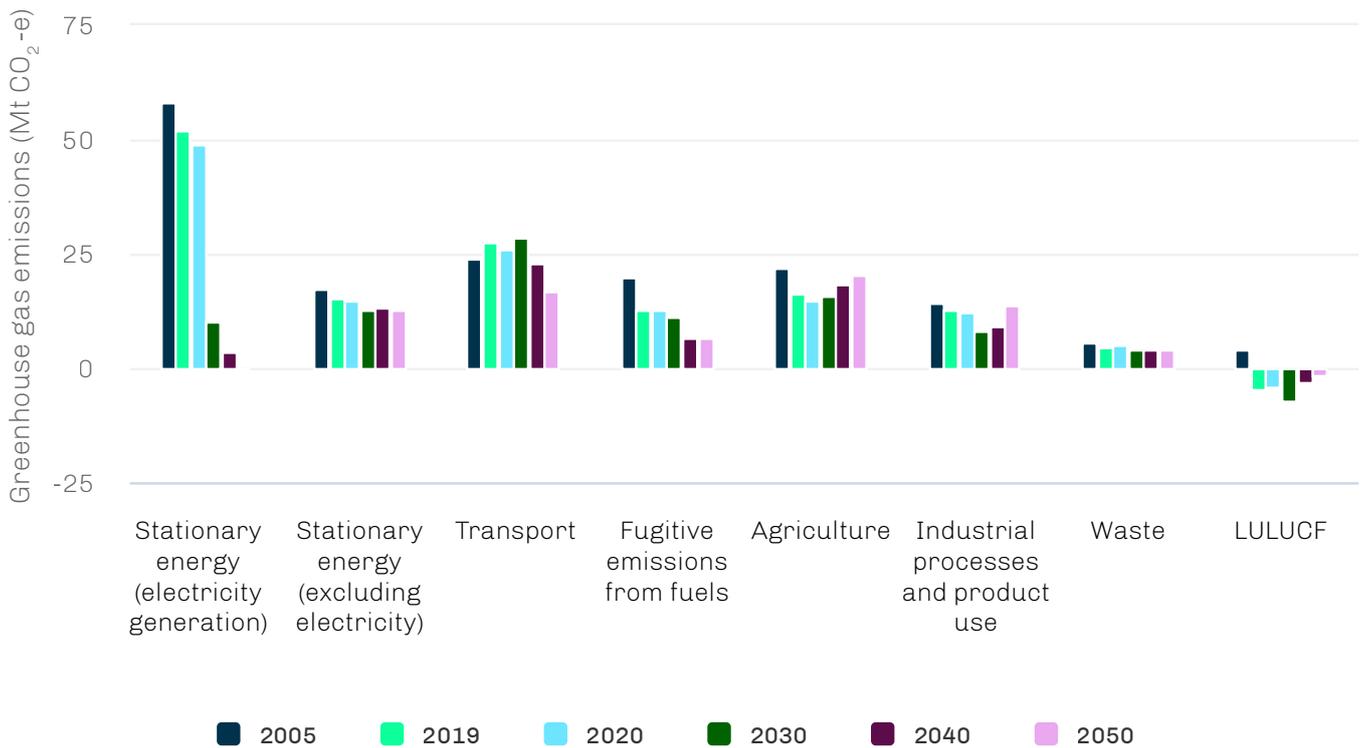
Source: Figure 5.2, SoE 2021

Notes

1. LULUCF = Land use, land-use change and forestry
2. Emissions to 2019 are from (DISER 2021). Emission projections for 2020–30 are based on NSW Department of Planning, Industry and Environment modelling and analysis.

Electricity generation emissions are forecast to reduce significantly as a result of an increased share of renewable energy as the State’s coal-fired power stations are retired. Projections indicate that action beyond current policies will be needed to address emissions from most sectors, including heavy-duty vehicles, agriculture, stationary energy, industry, mining, aviation and land clearing (see **Figure A3** below).

Figure A3 Inventoried and projected NSW emissions by sector with current Net Zero Plan Stage 1 policies implemented, 2005–50 (based on UNFCCC key categories)



Source: Figure 23.6, 2021 SoE report

Note: LULUCF = Land use, land-use change and forestry

Black carbon emissions

Black carbon emissions have been linked to both climate warming and adverse health effects and have become a focus in recent years. ‘Black carbon’ refers to small airborne particles emitted by combustion processes. These particles remain in the air for shorter periods (days) when compared to greenhouse gases, which persist for tens to hundreds (or even thousands) of years. Nevertheless, black carbon emissions still cause short-term warming of the atmosphere and impact human health.

About 51 kilotonnes of black carbon were estimated to have been emitted in NSW in 2018–19, with 67% of emissions coming from the land sector (see Figure 5.6 in the SoE 2021 report). Land sector emissions of black carbon are due to bushfires and land management activities, including land clearing, post-harvest fires and hazard reduction burns. Transport was the second-largest source in 2018–19, emitting 26% of black carbon emissions. Transport-related black carbon emissions have increased over time, driven largely by the increased use of aviation fuel and growing diesel consumption by road transport.

Climate change impacts

The **Climate Change** topic of our SoE 2021 report describes the changes in current temperature and weather patterns in NSW, the future projections of change, and the impacts of these changes on the environment more generally. The following text is a brief summary of this topic.

The climate of NSW is changing due to global warming. The effects of climate change on the people and environment of NSW are expected to become more pronounced as the climate continues to change over this century.

Emissions of CO₂ and other greenhouse gases from human activity accumulate in the atmosphere, trapping heat and leading to global warming. Without substantial, concerted action, climate change poses a major threat to humanity and most living systems on Earth. While impacts are being observed now, they will become more pronounced over time. Extreme events such as extreme heat, dangerous fire weather and heatwaves are projected to increase in duration, magnitude and frequency with impacts on communities and infrastructure.

Globally, warming has increased by approximately 1.1°C since industrialisation (1850–1900). Based on current trajectories, global temperature will likely increase by approximately 1.5°C by around 2030. Exceeding this target will result in more serious and frequent heat extremes and bushfires, and fewer cold extremes.

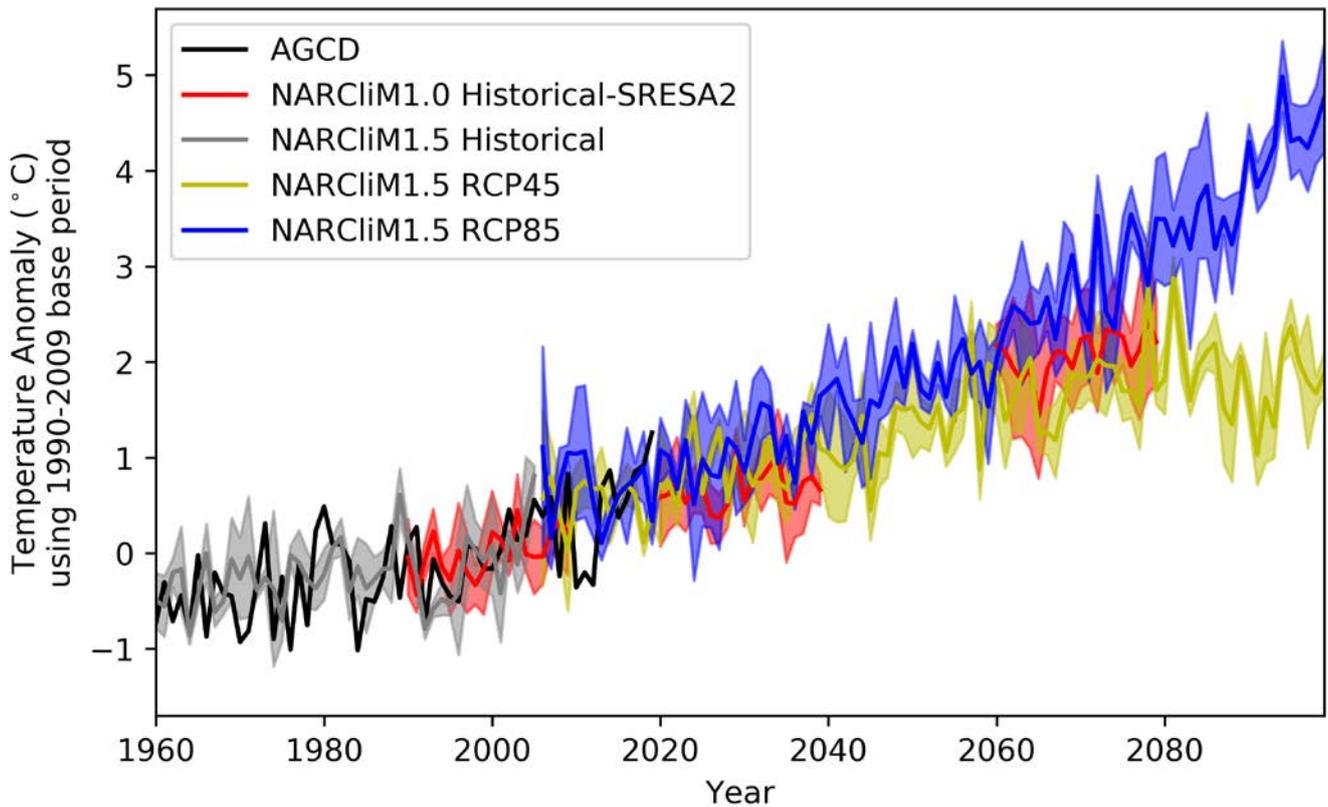
In NSW the mean temperature is about 1.4°C higher than in 1910, with 2018 and 2019 being the warmest years on record. Mean temperatures during 2020 in NSW were generally above average, with the exception of the State's south west. Black Summer fires peaked in December 2019–January 2020, causing widespread destruction and prolonged poor air quality in Sydney and Canberra.

Other observed changes include increased seasonal variability in rainfall and increases in some extreme weather events such as heatwaves.

The changes to climate are expected to become more severe over time. Regional climate projections over NSW suggest that by 2070 mean temperature will have risen by a further 2.1°C relative to a 1990–2009 baseline period, with much larger increases in extreme temperatures (see **Figure A4** below).



Figure A4 Observed and projected changes in annual mean temperatures for NSW and the ACT



Source: Spotlight figure 21, SoE 2021

Since the late 20th century, sea surface temperatures (SST) in the western Tasman Sea have increased by 0.2–0.5°C per decade. For the Sydney area, SST have increased by 0.2°C per decade since 1945.

The rate of sea level rise has nearly doubled. From an average rate of 1.7 mm per year during most of the 20th century, sea levels at the Port Kembla Baseline Sea Level Monitoring Station now indicate an average 3.4 mm increase per year since 1991. Globally, sea levels are expected to rise by a half to one metre [above the reference point of the year 2000] by the end of the 21st century.

The future effects of climate change will be extensive, including more extreme weather events, increasing coastal erosion and inundation and greater impacts on infrastructure, human health and wellbeing. The survival of many species and ecosystems, water availability, and the productivity of some agricultural systems will be affected.

Effective action to counteract the effects of climate change depends on concerted action globally. The extent of climate change impacts will be determined by mitigation and adaptation actions and the time taken to reduce greenhouse gas emissions.

Appendix B

Principles and factors guiding our response to climate change

Table B1 The EPA's decision-making principles and how they are guiding our regulatory response to climate change

Principle	Our regulatory response to climate change
Responsive	We'll respond to the threat of climate change, to prevent and reduce harm to the environment and human health. We'll implement our climate change response in a practical, timely and efficient manner. We'll respond quickly to new information.
Prevention-focused	We'll use a mix of regulatory tools as part of our climate change response and play our part to help prevent climate change and to reduce exposure to the risks and impacts associated with a changing climate.
Effective	We'll apply the right tool at the right time and take appropriate action to address climate change, in a way that complements the <i>NSW Climate Change Policy Framework</i> . We'll follow through on our commitments and make adjustment where needed.
Targeted	We'll focus our climate change response where we can achieve the best environmental and human health outcomes.
Informed and evidence-based	We'll use an evidence-based approach to developing our climate change response, informed by sound science, EPA priorities, an assessment of risk, data, intelligence and insights, Aboriginal knowledge, behavioural insights, and information received from the community, interest groups, industry and other regulators.
Firm but fair	We'll consider the attitude and behaviour of our regulated community, including voluntary measures already taken to mitigate and adapt to climate change. We'll balance environmental, social and economic considerations and will not impose unreasonable costs on business. We'll implement new requirements in a predictable, and where necessary, an appropriately staged way, so our regulated community has time to adjust.
Consistent and coherent	We'll apply our climate change response to our regulated community in a consistent and coherent manner. We'll consider individual circumstances, where appropriate.
Transparent	We'll provide clear information about our climate change response to our regulated community and the broader community and provide access to information about environmental performance.
Ethical and accountable	We'll act in accordance with the <i>EPA Code of Ethics and Conduct</i> , the decision-making principles and decision factors in our <i>EPA Regulatory Policy</i> , and other relevant policies and guidance. We'll review this policy and take responsibility for our actions. We'll measure and report on the performance of our climate change response.
Collaborative	We'll ensure our climate change response complements other initiatives that are part of the <i>NSW Climate Change Policy Framework</i> . We'll partner with Aboriginal people, young people and stakeholders including our regulated community, our regulatory partners, local communities and others to enhance mutual understanding and deliver the best environmental and human health outcomes.

Note: The EPA's decision-making principles are outlined in the *EPA Regulatory Policy* (EPA 2021a).

Table B2 Relevant EPA decision factors and how we have considered them in our regulatory responses to climate change

Factor	Our regulatory response to climate change
<p>Actual or potential harm to the environment or human health</p> <p>Seriousness of the environmental or human health issue</p>	<p>We've considered the actual and potential impacts of climate change on human health and the environment of NSW, and the seriousness of the issue. We recognise that without substantial, concerted action, climate change poses a major threat to humanity and most living systems on Earth. While impacts are being observed now, they will become more pronounced over time. Extreme events such as extreme heat, dangerous fire weather and heatwaves are projected to increase in duration, magnitude and frequency with impacts on communities and infrastructure (EPA 2021d).</p>
<p>Scale and extent of the environmental or human health issue and how often it occurs</p>	<p>We've considered the widespread, persistent, worsening and cumulative impact of climate change on the environment and communities of NSW.</p>
<p>Measures needed to ensure best outcome</p>	<p>We've considered the measures to bring about the best environmental and human health outcomes, recognising that combating climate change needs a coordinated, multi-government response. Our regulatory response complements, support and builds on international, national and NSW climate change responses. It will also evolve, and we will actively look to improve and mature it over time.</p>
<p>Public value</p>	<p>We're committed to delivering public value and acting in the public interest. We've considered public interest and wellbeing to ensure we deliver outcomes that are of value to the people of NSW. Our regulatory response to climate change will:</p> <ul style="list-style-type: none"> • reduce harm to the environment and human health • respond to community expectations • recognise connection to place and Country – land, waters and culture – of Aboriginal people • seek to minimise the impact of our actions on the community (e.g. minimising disruption to – or cost of – essential services such as power supply or sewage services).
<p>Legislative and policy frameworks</p>	<p>We've considered our statutory objectives and duty to protect the environment and human health from climate change. We've considered our role to complement, support and build on the foundations set in the <i>NSW Climate Change Policy Framework</i>, <i>Net Zero Plan Stage 1</i>, <i>Net Zero Implementation Updates</i> and <i>Climate Change Adaptation Strategy</i>.</p>
<p>Precedent</p>	<p>We've considered the climate change responses of environmental regulators in other countries and other Australian jurisdictions. We've ensured we have aligned our responses, where appropriate. We'll continue to collaborate with other regulators as our approach evolves.</p>

Factor

Our regulatory response to climate change

Environmental justice

We've considered environmental justice principles, including the impact of climate change on disadvantaged and vulnerable communities and people (now and into the future). We'll ensure our climate actions are fair and, where appropriate, allow for meaningful involvement, regardless of age, ethnic background, socio-economic background and status, and seek to achieve intergenerational equity.

Note: The EPA's decision factors are outlined in the EPA's *Regulatory Policy* (EPA 2021a).



