29 January 2021

**RE: Submission for Federal 2021/22 Budget**

Adaptive Capability (AdaptCap) is a consultancy focused on helping organisations assess and control emerging climate risks, while also benefitting from opportunities arising from climate mitigation and adaptation.

At a country level, Australia is extremely vulnerable to both physical and transitional climate risks (adopting terminology as defined by the Taskforce for Climate-related Financial Disclosures: refer tcfdhub.org for more information).

As is well understood, the increase in average atmospheric and ocean temperatures associated with global anthropogenic emissions of carbon dioxide, methane and other greenhouse gases leads to greater frequency and/or intensity of a variety of extreme weather including droughts, heatwaves, storms, reduced frost days, and so on. Globally, sea levels are rising at an accelerating rate due to both thermal expansion and land-ice melt, with deleterious implications for coastal regions. These and additional factors including increased ocean acidification (caused by dissolving atmospheric carbon dioxide) are stressing marine ecosystems including coral reefs.

Most anthropogenic greenhouse emissions are associated with the extraction and consumption of fossil fuel energy sources including coal, oil and gas. Land use change and agriculture are other major sectors.

Within Australia and around the world, governments, cities, companies and institutional investors are calling for and acting on mandates aligned with the Paris Climate Agreement to reduce emissions in line with the global commitment to attempt to limit temperature rise to, ideally, no more than 1.5 degrees Celsius. This process of decarbonisation of the global economy is giving rise to transition risks for countries and organisations, whose success may be adversely impacted by trading partners’, competitors’ or others’ measures to reduce emissions. Given Australia’s highly fossil-fuel intensive economy and exports, our economy is at significant risk.

However, decarbonisation (and adaptation to the impacts of climate change) also create opportunities for many businesses and some countries (notably including Australia given our substantial renewable resources – sun, wind, empty land and relative proximity to large Asian markets).

Critically, since emissions are cumulative (due to the persistence of greenhouse gases in the atmosphere over decades to millenia), emissions reductions must be considered in terms of an overall budget, which can be used up gradually, but under current conditions is being exhausted rapidly. In approximate terms, a science-based target to cap average warming at around 1.5 degrees, implies a halving of current global emissions by 2030 and achievement of “net-zero” emissions by 2050. The less emissions are reduced this year, the harder the target in future years and the less likelihood of achieving the Paris Agreement target.

It is no overstatement to describe climate change as an existential threat to Australia’s (and the world’s) prosperity, health and way of life. Given the closely related collapse in biodiversity, it is the single greatest threat facing humanity, and it is incumbent on governments around the world to set policies that:

* Accelerate emissions reduction (decarbonisation) and position themselves to avoid transition risks and capture opportunities.
* Help societies adapt sensibly and effectively to the current and future physical impacts of climate change, while simultaneously reversing biodiversity loss.

Climate change is affecting many aspects of our economy and society and requires holistic action across all layers of government.

The purpose of this submission, therefore, is to provide a sample of areas of government spending where effective policies and budgetary allocations would best prepare Australia for the systemic global changes that are already upon us. As such we provide brief suggestions in accordance with the budgetary submission structure, which has been tabulated below. We would be delighted to expand on any of the content herein based on our many years’ of research and work with private and public sector organisations.

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| **Agriculture, Water and the Environment** |
| Agriculture | * Research and incentives to promote rapid acceleration (and appropriate measurement) of farming techniques that assist with carbon retention in soils. A redistributive carbon price would be extremely efficacious in this regard.
* Assistance to commercialise and deploy emerging feed additives that reduce ruminant livestock methane emissions.
* Adjustment of agricultural policies and incentives to anticipate and encourage increasing uptake of plant-based diets and reduction in meat consumption.
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| Antarctic policy | * Increasing surveillance and research of Antarctic ice loss and implications for sea levels.
* Research related to the broader implications of climate change in the region. For example, decreased salinity of the Southern Ocean due to Antarctic ice loss and impacts to marine ecosystems; consequential implications for fisheries.
 |
| Biosecurity | * Increasing research around control of invasive species that may become more prevalent (and move polewards) due to changing climatic conditions.
* Research and development assistance to improve drought, heat and pest resistance of key food crops; reduce agricultural water intensity; and counteract reducing cold nights for frost dependent crops.
 |
| Climate change | * Implementation of a comprehensive climate change policy covering economy-wide decarbonisation and society-wide adaptation, including, for example, the implications of the Climate Change Bill that is currently before Parliament.
* Develop and deliver a major public education campaign to provide factual, science-based information on the risks of climate change and the economic opportunities of decarbonisation.
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| Drought | * Planning for projected increased incidence and longer duration of drought events including a review of hardship grants under future climate scenarios.
* Widespread adoption of farming techniques that increase soil carbon capture will also assist with moisture retention and reduce runoff issues when heavy precipitation events occur.
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| Environmental policy and programs | * Environmental policy and programs must value natural capital and incentivize activities to draw down atmospheric carbon and reverse biodiversity loss including afforestation and rewilding. A redistributive carbon price would be helpful to encourage climate-friendly land use allocation.
 |
| Emergency management | * Ensure disaster relief and emergency management are resourced and prepared to deal with the expanding frequency, severity and extent of natural disasters associated with climate change.
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| Fisheries | * Research to establish the likely implications of warming and acidifying oceans in Australian territorial waters on marine food stocks.
* Development of algaculture industries (macro seaweeds and micro algae), both for food use; for bio carbon sequestration applications; and for the replacement of fossil-based hydrocarbons in many chemical processes.
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| Forestry | * Sustainability of all forestry activities should be reviewed given future climate projections and the vulnerability of forests to climatic shifts, new pest vectors and extreme weather. Conserve remaining old growth forests.
* Promote the development of sustainable structural timber industries (as a replacement for emissions intensive steel and concrete).
 |
| Waste reduction | * Reframe waste and recycling within the context of a circular economy. Engage with industry to improve product durability, reduce use of packaging and polluting products, introduce increasing minimum recycled content standards and promote/mandate cradle-to-cradle practices including take-back / buy-back schemes (for example based on EU models).
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| Water policy and resources | * Review the sustainability of major water uses and establish positive/negative incentives to reduce reliance on irrigation.
* Consider the sustainability of urban and regional water systems given stressors such as variability in precipitation; extreme precipitation and runoff;
* Impose true costs on all water users, including appropriate valuation of damage to natural capital.
* Set increasing targets to improve energy efficiency and reduce emissions for fresh and waste water filtration and distribution systems.
* Increase re-use of waste water streams.
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| **Attorney-General’s** |
| Bankruptcy | * Consider the implications of decarbonisation and broader transition and physical climate risks so that bankruptcies in adversely affected sectors can be better anticipated – and in many cases avoided – by helping companies and/or individuals transition to clean alternatives.
 |
| Human rights / discrimination laws | * Develop a Bill of Rights that includes the right to a safe climate.
* Criminalise the dissemination of mis- and dis-information about climate science and the risks/opportunities of climate change.
 |
| Industrial relations | * Develop programs to help unions and workers adversely affected by the transition away from fossil fuels to develop new skills and industries.
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| **Defence and Veterans' Affairs** |
| Defence | * Conduct climate risk assessments covering all defence facilities, assets and operations and implement appropriate controls.
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| Defence industries | * Ensure climate risk implications are considered in the design and procurement of new defence facilities and equipment.
 |
| **Education, Skills and Employment** |
| Early childhood education | * Grants/assistance for all childcare facilities to implement solar panels with battery storage would provide numerous educational co-benefits including reduced spend on energy becoming available for schools to invest in educational programs, plus reduced operating costs for air conditioning so that children’s learning potential is not adversely impacted by increasingly hot days.
 |
| Primary and secondary schools | * Grants/assistance for all schools to implement solar panels with battery storage would provide numerous educational co-benefits including reduced spend on energy becoming available for schools to invest in educational programs, plus reduced operating costs for air conditioning so that children’s learning potential is not adversely impacted by increasingly hot days.
* School buildings should be equipped with air filtration to prevent respiratory conditions and the potential for lifelong illnesses due to the exposure to bushfire scope. This may also become an increasing liability issue for schools.
* Ensure climate change and associated topics such as biodiversity and conservation management, carbon accounting, etc. are embedded across all curricula to ensure the education system produces graduates with appropriate skills to meet the current challenge.
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| Tertiary education | * Ensure climate change and associated topics such as biodiversity and conservation management, carbon accounting, etc. are more widely available as digree level courses to ensure the education system produces graduates with appropriate skills to meet the current challenge.
* Expand research funding for topics relating to climate, decarbonisation and adaptation.
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| Vocational education apprenticeships and skills | * Expand vocational education programs for emerging decarbonisation and adaptation industries.
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| Workplace health and safety | * Ensure WHS legislation/regulation requires employers to consider and develop mitigation plans for emerging climate risks for their workers, including, for example, prolonged exposure to bushfire smoke.
 |
| **Finance** |
| Government procurement policy | * Ensure carbon intensity (alongside climate risk) is explicitly assessed in government procurement. Align government procurement with a science-based net-zero target.
 |
| Property management | * Conduct climate risk assessments for all government properties / infrastructure and develop appropriate mitigation plans.
 |
| **Foreign Affairs and Trade** |
| International Trade Policy | * Develop planning for an orderly transition from fossil-based exports (principally coal and LNG) to clean energy exports such as green hydrogen, green ammonia, inter-continental electricity cables; and products manufactured locally using renewable energy / green hydrogen including green steel.
* Anticipate and prepare for the introduction by key export markets of duties or other restrictions affecting trade of emissions intensive goods or from countries such as Australia with high per-capita emissions intensity.
 |
| Official Development Assistance (overseas aid) | * Ensure Australia’s commitments to developing countries as part of the Paris Agreement are honoured (and not at the expense of other aid programs).
 |
| Tourism | * Develop planning for the transition of climate-exposed tourism assets including coral reefs, low-lying islands, iconic beaches exposed to coastal erosion, and alpine sports.
 |
| Trade and investment | * Given the explosive and consistently under-forecast growth of renewables; the marked shift in global rhetoric about climate risk and net-zero during 2020; and the increasingly superior economics of renewables, government modelling should anticipate that global demand for fossil fuels may tend to peak and decline faster than has been predicted by the International Energy Agency and other conservative prognosticators. For example, the expectation of relatively near-term price parity of electric vehicles (EVs) with equivalent internal combustion engine (ICE) models will likely see very rapid EV uptake, combined with growing city and country announcements that will rapidly depress demand for ICE vehicles.
* Develop programs to encourage the adoption of emerging technologies.
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| **Health, Aged Care and Sport** |
| Aged care | * The physical effects of climate change may exacerbate the vulnerability of aged persons to, for example, heat related illness or injury. Aged care facilities will increasingly need to have effective insulation and cooling to protect residents, along with air filtration during major bushfire events.
 |
| Health care (inc hospitals, Medicare and PBS) | * Assess the capacity of the health care sector to cope with emerging climate related health conditions including heat-related or exacerbated illnesses; bushfire smoke exposure; and mental health associated with climate/eco anxiety/grief conditions.
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| Health insurance | * Assess the capacity of the health insurance industry to cope with emerging climate related health conditions including heat-related or exacerbated illnesses and bushfire smoke exposure.
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| Health research | * Working with the AMA and groups such as Doctors for the Environment Australia, provide research funding to assist with the health care recommendations above.
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| Senior Australians | * Refer Aged Care.
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| Sport | * Review the implications of the warming trend and associated extreme weather on outdoor sports and sporting venues. Consider factors such as athlete safety and trends in health outcomes over time.
 |
| Youth | * Develop programs to improve climate-related health outcomes for in-utero and infant Australians, including prolonged exposure to heat and bushfire smoke.
 |
| **Home Affairs** |
| Community safety | * Ensure community safety considers and develops mitigation plans for emerging climate risks including increased heatwave exposure and prolonged exposure to bushfire smoke.
 |
| Disaster relief and emergency management | * Ensure disaster relief and emergency management are resourced and prepared to deal with the expanding frequency, severity and extent of natural disasters associated with climate change.
* Review developments in disaster management technologies. For example, there are technologies that provide less labour intensive, faster and more effective riverine flood management than traditional sandbags.
* It is worth noting that the implementation of distributed renewable power generation may assist disaster relief and emergency management by reducing grid reliance.
 |
| Immigration | * Develop a coherent climate migration / refugee policy, anticipating future movements both from low lying island nations and from countries whose food or water supplies are threatened by changing climatic conditions.
 |
| National security | * Recognising that climate change is a first order national security issue, ensure national security planning and preparedness explicitly considers the implications, which may include:
	+ Greater resources for domestic and regional natural disaster response and relief.
	+ More challenging domestic and natural disaster response and relief given the severity of extreme weather events (climate change as a threat multiplier).
	+ Regional natural disaster events may catalyse temporary or permanent climate migration.
	+ Regional conflict over food and water insecurity.
	+ Australia’s history as a laggard in climate action may inflame regional tensions.
* It is worth noting that decarbonisation carries co-benefits for national security in terms of removing Australia’s high dependence on imported liquid fuels.
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| **Industry, Science, Energy and Resources** |
| Emissions reduction | * Legislate science based targets for emissions reduction including a revised 2030 target and net-zero by no later than 2050.
* Review existing emissions reduction programs such as the Emissions Reduction Fund, which have been largely ineffective and inefficient at reducing emissions.
* Establishment of a redistributive carbon price has consistently been found to be the most effective method of reducing emissions.
 |
| Energy policy | * Electricity: Implement the recommendations of AEMO’s 2020 Integrated Systems Plan, targeting and seeking to exceed the Step Change Scenario. In particular, assistance to develop Australia’s offshore wind capability and explore interconnects to Far North Queensland (to allow the NEM to benefit from the inverse relationship between Coral Coast wind patterns and those in the south eastern states) could greatly reduce the variability of renewable generation, therefore limiting the need for storage systems or gas generation.
* Natural Gas: Develop planning to phase fossil methane use out of buildings (electrification) and industry wherever feasible, including suitable incentives for fossil energy intensive industries. Ensure that as LNG exports begin to ramp down, green hydrogen and/or ammonia exports are ready to replace it. Abandon existing unrealistic proposals to reduce East Coast domestic gas prices.
* Green Hydrogen (from electrolysis powered by renewably generated power): In addition to programs to help kick start the green hydrogen export industry and achieve scale economies to drive the cost below $2/kg as targeted in the Technology Roadmap, detailed deployment and transportation strategies for green hydrogen should be developed in the expectation that natural gas use is phased out, *but* that green hydrogen is only used to substitute gas (or other fossil fuel) uses that cannot be electrified. Blue hydrogen production (from coal/gas with carbon capture and storage) should *not* be encouraged or supported by government due to its high residual emissions footprint and the continued issues with carbon capture (high costs and low efficacy). Explore green hydrogen or derivatives for inter-city heavy transport and shipping.
* Liquid Fuels: Develop planning in conjunction with transport policy (refer elsewhere) for the rapid phase out of liquid fossil fuels (diesel, petrol). Assist the aviation industry to develop emissions free alternatives.
* Ensure the renewable electricity grid is scaled to meet additional demand from the electrification of buildings, transportation, industry, and green hydrogen production for domestic and export uses.
 |
| Industry and innovation | * Prioritise the development of “clean tech” industries including renewable energy and storage technologies, electrification, green steel, energy efficiency, circular economy, etc.
* Assist manufacturing industries that cannot fully decarbonize with carbon capture, use and storage (CCUS) innovation. CCS/CCUS assistance should not be provided to sunsetting industries (including use of coal and methane for electricity production; or any uses of fossil fuels in industry where electrification or green hydrogen are or will become viable substitutes given suitable scale economies).
 |
| Mining / Resources (minerals, oil, gas) | * Place a moratorium on new fossil resource exploration or development licenses on Crown-controlled land; existing licenses generally not to be renewed on expiry except in compelling circumstances.
* Development of programs to assist fossil-fuel extractive dependent regional communities to transition away from coal and gas mining towards clean alternative industries.
* Programs to ensure that discontinued coal mines are effectively rehabilitated and that retired gas wells are permanently capped to limit fugitive methane emissions.
* Resource programs to provide industry-independent measurement of fugitive methane emissions from coal and gas extraction and processing facilities and pipelines.
* Explore opportunities to capitalize on global demand for copper, lithium, rare earths and other resources that will be required to help facilitate the energy transformation globally.
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| Northern Australia | * Develop planning for Northern Australia as a major clean energy production and export hub, noting climatic, infrastructure and skills constraints.
 |
| Research | * Prioritise funding for research and development of climate mitigation and adaptation – refer elsewhere for specific examples.
 |
| Science | * Increase funding for climate science and related research, particularly to provide additional fidelity to future climate projections. Accelerate CSIRO’s update of the ACCESS projections database and GIS.
 |
| Technology | * Develop planning and programs to expand technology innovation that supports industries such as energy storage, electrification, etc. Help connect technologists with energy and circular economy specialists.
 |
| **Infrastructure, Transport, Regional Development and Communications** |
| Arts funding | * Provide specific funding for arts performances and installations that draw attention to climate change and risks.
 |
| Aviation | * Develop industry-wide emissions reduction plans aligned with science-based targets.
 |
| Cities | * Undertake metropolitan level climate risk assessments and develop regional climate resilience programs including water and food security; urban heat exposure; sea level rise; storm, bushfire and flood risk; etc. Adjust planning instruments and construction codes.
 |
| Cyber safety | * Develop programs to reduce the dissemination of mis-and dis-information about climate science and climate risks/opportunities over social media and other Internet-based technologies.
 |
| Infrastructure | * Ensure all critical national infrastructure is subject to regular and comprehensive climate risk assessments using the best available climate projections.
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| Local government and territories | * Ensure LGAs are adequately funded to undertake comprehensive climate risk and adaptation assessments.
* Harmonise LGA and state legislation to minimize adverse litigation given the need to adopt new planning restrictions to minimize private property losses and public remediation costs from emerging physical climate risks. For example, treatment of growing coastal erosion zones is a contentious area that requires careful consideration to avoid expensive cycles of asset protection followed by poorly-managed retreat and litigation by property owners.
 |
| Maritime | * Support the development and experimentation of clean fuels (such as ammonia from hydrogen, green hydrogen, or renewable power) for domestic and international shipping fleets.
 |
| NBN | * Ensure NBN infrastructure is subject to regular climate risk assessment and infrastructure hardening.
 |
| Regional development | * Plan for the managed decline of fossil-intensive industries in regional centres.
 |
| Road and rail transport | * Develop a coherent national plan and program for the rapid deployment of electric vehicles and associated infrastructure (including the implications of residential, LGA and commercial charging systems on electricity distribution; and the potential for emerging autonomous vehicle technologies to change vehicle ownership and usage patterns).
* Assess climate risks to all road and rail infrastructure including adequacy of drainage; exposure to coastal inundation (due to larger storm surges that are further magnified by increasing sea level rise); heat and drought tolerance; etc.
* Overhaul infrastructure development standards to ensure new infrastructure designs are climate ready including drainage, elevation, heat tolerance, EV ready (e.g. consider Scandinavian developments), etc.
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| **Prime Minister and Cabinet** |
| Australian Public Service | * Require all departments and agencies to conduct comprehensive, scenario-based climate risk assessments and implementation of appropriate controls. Consistent frameworks should be developed covering a broad range of physical and transition risks across multiple scenarios.
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| Indigenous affairs | * Develop programs to assist indigenous communities to adapt to climate change. Given their connection to Country, this is a complex and contentious issue, particularly for some remote communities exposed to current and near-term climate risks.
 |
| Intergovernmental relations | * Establish mechanisms to harmonise commonwealth, state and LGA efforts on climate change.
 |
| **Social Services** |
| National child protection policy | * Recognise climate/eco anxiety/grief and climate change as risks from which children require and deserve protection.
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| Disability services | * Recognise climate/eco anxiety/grief as an emerging mental health condition.
* Acknowledge emerging climate risks as threat multipliers for chronic health conditions.
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| Preventing domestic violence | * Specifically recognise that the effects of climate change (such as prolonged heatwaves) act as a threat multiplier for domestic violence.
 |
| Social housing and homelessness | * Fund upgrades to (and mandate minimum standards for new) social/public housing to improve energy efficiency; provide adequate cooling; and use of solar PV electricity generation to defray air conditioning operating costs.
 |
| Welfare  | * Acknowledge that climate change disproportionately impacts the poor and other disadvantaged groups. Assess sustainability implications welfare programs.
 |
| **Treasury** |
| Banking, insurance and financial services | * Provide emissions reduction policy certainty (legislated net-zero target and science-based interim targets, etc.) to provide investment certainty and encourage “climate friendly” capital allocation for both decarbonisation and adaptation projects.
* Support the development of industry-wide “green” finance initiatives.
* Ensure consistency in the assessment of climate risk by financial markets participants.
 |
| Economy | * Develop detailed economy-wide modelling for a variety of science-based net-zero emissions reduction scenarios, including assessment of the costs of increasing climate change and failure to enact net-zero policies given announcements by major trading partners (most of which now have net-zero mandates).
 |
| Fiscal Policy and budget processes | * Provide incentives including concessional loans and tax relief to speed adoption of decarbonisation and adaptation measures where practical (for example incentives to accelerate adoption of EVs).
 |
| Housing supply | * Minimum energy efficiency performance and electrification (no-gas appliances) should be mandated for new builds, new subdivisions, and substantive redevelopments.
* Exposure of housing stock to increasing extreme weather should be assessed, including declining insurability.
 |
| Population | * Decarbonisation will be simplified if population growth is minimised. Population policy must be redeveloped to encompass future projections of food and water productivity and implications for cities and regional centres. Modelling should consider scenarios involving an influx of climate refugees in later decades.
 |
| Productivity | * The implications of climate change on productivity should be assessed given interruptions from heatwaves and other natural disasters, amongst other factors.
* The implications of decarbonisation on productivity including opportunities to use the disruptive impact of this transition to make step changes in productivity and improvements in equity should be carefully considered.
 |
| Statistics | * Key climate indicator statistics should be developed and reported alongside traditional metrics. For example, development of a decarbonisation index that tracks progress towards net zero weighted by industry and regional contribution to emissions.
 |
| Superannuation | * The implications of climate transition risks on superannuation balances and future fund performance should be urgently assessed. Industry consultation should be undertaken to reduce adverse impacts as fossil fuel demand peaks and declines globally, and decarbonisation affects the profitability of many sectors and firms.
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| Taxation | * A redistributive carbon price has consistently been found to be the most effective method of reducing emissions.
* A variety of taxation relief measures could be considered to speed adoption of decarbonisation and adaptation measures.
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We thank you for considering our submission and are happy to provide further information and substantiation upon request.

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