Market Signals for a Sustainable Future

OCTOBER 2021
## Content

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Establish a meaningful carbon price and effective carbon markets</td>
<td>4</td>
</tr>
<tr>
<td>Commit to net-zero sectoral mandates and incentives</td>
<td>4</td>
</tr>
<tr>
<td>Support zero-carbon innovation and technology</td>
<td>8</td>
</tr>
<tr>
<td>Development finance reform</td>
<td>9</td>
</tr>
<tr>
<td>Prioritise and invest in nature, people and planet</td>
<td>10</td>
</tr>
<tr>
<td>Contacts</td>
<td>11</td>
</tr>
<tr>
<td>Endnotes</td>
<td>12</td>
</tr>
</tbody>
</table>
Introduction

The most recent Intergovernmental Panel on Climate Change’s assessment\(^1\) stated that to achieve the 1.5°C goal of the Paris Agreement, global net man-made carbon dioxide (CO\(_2\)) emissions would need to decline by about 45% from 2010 levels by 2030, reaching net zero around 2050. The remaining carbon budget that would be available for a 1.5°C pathway amounts to around 400 gigatonnes (Gt) of CO\(_2\), which is very limited given that in 2019 emissions were around 33Gt. In simple terms, if society is unable to reduce current levels of emissions, the 1.5°C carbon budget will be exhausted before 2040.

The call to action is stark; if we are to avoid dangerous climate change, an unprecedented and sustained reduction in emissions is required within a very short space of time. To compound the challenge, the demand for energy and natural resources is increasing as populations expand and age, and standards of living rise, and this will need to be factored into reduction and efficiency-generating pathways.

While the COVID-19 pandemic saw an interim reduction in emissions, it has yet to give rise to the sustained structural changes that could see emissions continue to fall sharply. There are several critical actions that governments can take now to drive sustainable health for nature, people and planet, by unlocking the investment of over USD4 trillion\(^2\) per annum by 2030 that is needed to keep the Paris Agreement on track.

This paper emphasises the enormity of the challenge that society must rise to, with ambition, urgency, and sustained action. The recommendations in this paper are by no means an exhaustive list but they are among the most urgent and highest of priorities and are necessary to secure a prosperous and healthy future for all.
Establish a meaningful carbon price and effective carbon markets

Well-designed carbon markets are a proven and economically efficient way to incentivise changes needed in investment, production, and consumption patterns, and can induce technological progress which will reduce future abatement costs. Some of the actions that should be taken to make carbon markets effective include, but are not limited to, the following:

• Put a meaningful economy-wide price on carbon that reflects the full costs of climate change as part of a broader mix of policy instruments to support clean technology investments and innovation. Over time, the carbon price will need to ratchet up. Indicatively\(^3\), evidence in the markets today show that a carbon price of between USD30-70 will shift coal out of the energy mix towards gas and renewables. USD70-120 will unlock opportunities for hard-to-abate industries, such as steel and cement, to decarbonise by making carbon capture and storage (CCS) and hydrogen commercially viable. USD120-250 should unlock bioenergy with CCS (BECCS) and Direct Air Carbon Capture and Sequestration (DACCS) for CO\(_2\) removal. In establishing carbon pricing systems, it is important to establish a pace at which the price increase does not exceed the economy’s ability to deal with it.

• Drive more accurate pricing in emissions trading systems by avoiding measures that undermine the market’s effectiveness. Establish mechanisms to encourage and enable international carbon credit transfers and put in place measures to address international market dislocations.

• Embrace business and consumer voluntary offsetting and encourage the use of natural climate solutions as a viable mechanism for channelling large scale investment into reforestation and avoided deforestation. In the medium term, keep the voluntary market separate from the accounting arising from Nationally Determined Contribution obligations.

• Remove fossil fuel subsidies that distort carbon pricing, ideally by 2025. Fossil fuel subsidies can undermine carbon pricing and discourage investment in clean energy and energy efficiency, making it difficult for renewable energy and energy-efficient equipment to compete with fossil fuels. The removal of fossil fuel subsidies must be measured, so as not to disadvantage developing economies and the less affluent, and it should take into account the principles of a just transition.

Commit to net-zero sectoral mandates and incentives

Effective carbon pricing systems take time to establish and therefore must be complemented by other well-designed policies to incentivise action in sectors where there is greater urgency to accelerate zero carbon outcomes, and where solutions exist today. In such cases, sector-level mandates can create markets that will drive investment:

**Power:** The transformation of the electricity sector is central to achieving net-zero emissions by 2050. With emissions from electricity generation amounting to approximately 40% of global emissions, and demand set to rise, this sector must do the early heavy lifting in terms of emissions reduction.
Coal accounts for around 37% of electricity generation today, and yet lower carbon and clean alternatives exist at affordable prices. Of the wind, solar and other renewables that came on stream in 2020, nearly two-thirds were cheaper than the cheapest new fossil fuel. A carbon price of USD50 should remove coal from the power generation mix, but where robust carbon pricing regimes do not exist governments should mandate the end of coal in power generation in advanced economies by 2030 and in all countries by 2040. Scenarios suggest that this means replacing 100GW of coal capacity every year for 20 years with renewable and low carbon energy. Annual investment will need to rise from just over USD500 billion today to more than USD1.6 trillion in 2030 and mandating the end of coal will provide the market signal that is critical for unlocking this necessary investment. It should be acknowledged that for some emerging economies, a commitment to end coal in power generation by 2040 would be a difficult challenge. It is therefore imperative that public and private sector financing support is made available as a priority to these countries to enable a just and fair transition away from coal.

Transport: In combination, the transport sector accounted for roughly 27% of global emissions in 2019 and emitted nearly 8.5Gt CO₂. Because of advances in fuel and battery technologies, there are some clear actions that governments can take now to create the investment environment needed to transform the sector:

- **Light duty vehicles:** The billion passenger vehicles on the road today produce around 3.6 billion tonnes of CO₂ per year. Global electric vehicle (EV) sales grew by over 40% in 2020, adding three million new EVs on the road, largely as a result of European Union policy and stimulus measures in the People’s Republic of China. There are indications that EV sales in 2021 will reach 6.4 million in 2021, a growth of 98% over 2020. While encouraging, there is still a long way to go. To reach 100% market share by 2040, annual EV sales would need to rise to around 110 million by this date. By 2050, the IEA’s World Energy Outlook 2021 estimates that there will be over 3 billion EVs on the road and 3 terawatt-hours (TWh) of battery storage deployed. Achieving this transition will require removing barriers in both supply and demand, including significant global investments in battery production, electric vehicle charging infrastructure, and additional and decarbonised power generation. An important early signal to get this sector to play its part in a 1.5°C outcome is for governments to mandate that 100% of new car sales are zero-emissions vehicles (ZEV) by 2035 in leading markets. However, electrification can come at an environmental cost, as the critical raw materials required to electrify the economy, particularly lithium, nickel, cobalt, copper, and aluminium, will be required in significantly higher amounts. To
avoid such consequences, it is crucial that governments establish sustainable supply chains for the sourcing, and where possible, recycling, of these materials.

- **Heavy duty vehicles:** This sector will move slower than light duty vehicles as battery electric trucks are only just beginning to enter the market, and hydrogen fuel cell technologies are expected in the coming years. To set the right market incentives, governments should put in place a mandate for **100% of new sales of heavy goods vehicles to be ZEV by 2040**. Appropriate incentives should be put in place at a scale necessary to drive adoption and focus research and development (R&D) on the most important challenges, allowing adequate time for strategic infrastructure development.

- **Aviation:** Aviation accounts for 2.8% of global CO₂ emissions. Since 2000, commercial passenger flight activity has grown by about 5% per year. While gains have been made in operational and technical efficiencies in aviation, energy-dense liquid fuels will continue to power most commercial aircraft during this century. Sustainable Aviation Fuel (SAF), which results in lower carbon emissions, is available today as a lower carbon substitute for kerosene. Several governments, including the EU and UK, have proposed SAF targets, however, due to the international nature of the sector, support for the use of SAF must become a mainstream policy from a wider group of nations that consume the majority of aviation services. To this end, **governments should mandate that 10% of aviation fuel be SAF by 2030 on a sliding scale moving toward 100% by 2050.** Mandates alone will not be sufficient because of the high costs of manufacturing SAF, and **interim price support mechanisms** will be critical to attract investment. The blenders’ credit in the United States provides a bankable revenue stream. Contracts for difference also have strong potential and have been used to good effect in other sectors. Meeting a global ambition of 100% SAF by 2050 will require capital investments of USD1.0-1.4 trillion by 2050 (USD40-50bn per annum).

- **Shipping:** Transporting around 80% of the world’s traded goods, shipping is an international market that is highly competitive and plays a significant role in the global economy. The IMO has estimated that the shipping sector emitted just over 1 billion tonnes of CO₂ in 2018, accounting for about 2.9% of the global man-made CO₂ emissions for that year. Decarbonising the sector calls for significant investments in new fuel production, supply chains, and a new or retrofitted fleet. The scale of cumulative investment needed between 2030 and 2050 to achieve the IMO target of reducing carbon emissions from shipping by at least 50% by 2050 is approximately USD0.8-1.2 trillion, or on average between USD40-60 billion annually for 20 years. If shipping was to fully...
decarbonise by 2050, something which a substantial portion of the shipowner community has publicly expressed support for, this would require extra investments of approximately USD400 billion over 20 years, making the total investments needed between USD1.2-1.6 trillion dollars\textsuperscript{15}. The key measure that will enable shipping to decarbonise is a carbon pricing mechanism which ratchets up over time. Government action will be required to support R&D and scaling projects.

**Methane:** Methane is a strong greenhouse gas with a global warming potential 84 times greater than CO\textsubscript{2} in a 20-year time frame as it progressively breaks down to CO\textsubscript{2}. Methane has contributed to around 30% of the global temperature rise to date. 60% of global methane emissions derive from man-made activity, and of this around 30% comes from fossil fuel operations, the remainder coming principally from agriculture and waste\textsuperscript{16}. In terms of fossil fuel operations, the IEA estimates that to align with a 1.5°C trajectory, methane emissions must reduce by around 75% between 2020 and 2030. Of this, around one-third would result from a reduced use in fossil fuels, principally coal. The remaining reduction would need to come from the deployment of measures and technologies to eliminate avoidable methane emissions by 2030. The IEA estimates that it is possible to avoid more than 70% of current emissions with existing technology, and that around 45% could be avoided at no net cost\textsuperscript{17}. There is a growing coalition of companies who have made strong pledges to reduce methane emissions across oil and natural gas value chains\textsuperscript{18}, through leak detection and repair, technology standards and other mechanisms. However, they are in the minority, and government effort is needed to ensure the same level of effort is carried out within all supply chains. Governments can start by signing up to the Global Methane Pledge, recently announced by 8 countries and the EU\textsuperscript{19}. Other important actions involve removing the barriers to voluntary effort: requiring companies to collect and disclose accurate information on their methane emissions; putting in place infrastructure that enables all captured gas to be brought to market; and creating incentives for companies to invest in upgrading equipment. Removing barriers will not be sufficient on their own, and well-designed policy frameworks, designed to address differing national methane profiles, will be required to bring methane emissions down further\textsuperscript{20}. While much focus has been given to addressing methane emissions from fossil fuels, the same effort has not been given to agriculture and waste, which in combination amount to double the emissions, but where emissions are more diffuse and present a greater challenge to capture. As part of a broad range of measures, governments need to find ways to incentivise more sustainable farming practices, capture methane from landfills, and help populations to reduce meat consumption.
Support zero-carbon innovation and technology

**Industrial hard-to-abate sectors:** Carbon pricing and mandates can address power, transport, and methane emissions today at prices that can be accommodated, but it is critical that strong progress is also made in the hard-to-abate sectors too, such as steel and cement, which represent 30% of global CO₂ emissions. These industries have high energy dependency and long asset lifespans, and their decarbonisation pathways are complex and not widely affordable today. At an effective carbon price, technologies such as green hydrogen and CCS will be commercially viable to enable these sectors to decarbonise.

But in the absence of effective carbon pricing, **governments should increase support and investment in the deployment of green and affordable hydrogen and CCS and allocate sufficient R&D budgets to advance breakthrough technologies such as zero-carbon cement, BECCS and DACCS.**

**Financing considerations for establishing investment in hard-to-abate sectors:**

- Establish clear support and funding for transition areas, doing so through mechanisms with predictable and stable longevity that increase assurance for private investors to bring in capital at scale and support long-term investment decision-making.

- Better prepare project developers with access to information about risk-mitigation tools available, e.g., offtake and other insurance mechanisms, technical assistance, grants.

- Modernise risk management frameworks at local commercial banks (e.g., use of customer payment history to facilitate receivables financing).

**Public procurement:** Governments around the world spend an estimated USD9.5 trillion in public contracts every year, which in the OECD represents around 12% of GDP, and in many developing countries up to 22% of GDP. Public procurement is an important instrument of innovation policy and can bring existing low-carbon solutions to market today. **Governments should use public procurement rules to drive adoption and scaling of low and zero-emissions technologies, standardise green purchasing, support job creation and the development of small and medium enterprises.**

In addition to the measures above, governments should clarify the regulatory environment for transition finance and develop clear market infrastructure for transition finance.

**Capital markets infrastructure:**

- Develop/codify/endorse capital market mechanisms to support scalable transition finance in the public markets (especially equity markets), e.g., KPI-linked and transition bonds.

- Support harmonisation of transition finance categories / taxonomies to enable clearer matchmaking of capital sources while reducing the proliferation of costly new data systems.

- Expand the use of Green Banks to fund capital intensive transition technologies with blended public/private capital, with an eye towards commercial / private sector ownership.
• Develop or identify a public or philanthropic entity to cover the set-up and operating costs of innovative transition finance structures, including credible data and measurement tools.

Development finance reform

Leverage the Multilateral Development Banks to scale up exponentially and increase private sector partnerships, financing and investment in support of country-based transition and foreign direct investment priorities aligned with climate, biodiversity and just transition ambitions.

Public development finance alone cannot mobilise the resources necessary for the adaptation and mitigation of climate change on the timeline necessary to achieve a 1.5°C target. The private sector is a necessary actor in that it can help resource the sustainable transition at pace and scale, as well as respond to and drive consumer behaviours. This challenge is even more acute in the emerging economies that most MDBs work in, where governments’ fiscal and implementation space is even more constrained than in the developed world and the foreign aid budgets of advanced economies can only go so far.

While there are an emerging number of climate finance and blended finance mechanisms, many led by MDBs, the private sector has not invested to the extent required, and even the MDBs themselves have fallen behind. In fact, in 2020, climate finance from MDBs to developing countries decreased 8.4% from 2019 levels.

The lack of private sector mobilisation via the MDBs is largely due to structural factors and impediments, including the availability of ‘bankable’ sustainability projects and, very often, an unfavourable risk-return nexus.

To this end, the SMI has launched a Task Force, in partnership with the MDBs and other organisations, to address these issues, which will undertake the following activities, among others (Seizing a New Bretton Woods Moment):

• Map the range of existing climate finance mechanisms across the MDB landscape.

• Identify the systems-level and operational opportunities to make climate, sustainability, and public-private collaboration core components of MDB mandates.

• Identify options to address outstanding impediments to scaling private investment into emerging markets – particularly those investments that are required to lower greenhouse gas emissions to limit the global average temperature rise to 1.5°C.
• Identify where common platforms, data sharing and mechanisms would be helpful to increase private sector engagement and investment across MDBs.

• Identify how to generate a robust pipeline of genuinely sustainable, scalable and ‘bankable’ projects across MDBs. This includes an exploration around specific regions, foreign direct investment priorities and bundling and sourcing opportunities for scale.

• Identify how to overcome concerns of debt-to-GDP ratios and investment returns which have been raised as barriers to private financing for many emerging and climate-vulnerable economies.

Prioritise and invest in nature, people and planet

Progressing through the energy transition will involve trade-offs. In all decision-making, governments should facilitate a just transition towards a low carbon society and accelerate action towards sustainable health for nature, people, and the planet.

The COVID-19 pandemic has highlighted the interdependency between the fragility of our natural resources, health systems and human health. Many valuable lessons have been learned, such as the need for public-private partnerships to deliver sustainable outcomes. Such global collaboration is imperative to mitigate the impact of the climate crisis on everything it touches, including human health and biodiversity.

Governments should invest in and incentivise the development of a nature positive resilient society and economy in order to deliver on the United Nations’ Sustainable Development Goals and adopt the goals set by the UN Convention on Biodiversity. In all efforts on climate and biodiversity, which intrinsically connect human, environmental and societal health, the power of citizens, all of whom are consumers of energy and resources, should be harnessed. We must enable all citizens to make informed and sustainable choices in how they live.

In conclusion, this paper emphasises the enormity of the challenge that society must rise to, with ambition, urgency, and sustained action. The recommendations in this paper are by no means an exhaustive list but they are among the most urgent and highest of priorities and, most importantly, achievable. We call on governments to take these actions now and make every effort to put the world on a 1.5°C trajectory and secure a prosperous and healthy future for all.
Contacts

For more information about the SMI, visit
www.sustainable-markets.org

For enquiries, contact
info@sustainable-markets.org
Endnotes

1 IPCC Sixth Assessment Report, August 2021
2 Net Zero by 2050, IEA, May 2021
3 Price ranges are all influenced by exchange rates, inflation, gas prices, technology costs and other externalities.
4 Renewables Press Release, IRENA, June 2021
5 Mapped: The world’s coal power plants - The Financial Analyst
6 World Energy Outlook 2021, IEA, October 2021
7 Greenhouse Gas Emissions from Energy, IEA, August 2021
8 Global Energy Review, IEA, March 2021
9 https://www.ev-volumes.com
10 Zero Emissions Vehicles Briefing, Committee on Climate Change, July 2021
11 China, EU, Japan, UK, US
12 Aviation, IEA, June 2020
13 Aviation: Benefits Beyond Borders, Waypoint 2050, 2021
14 Fourth Greenhouse Gas Study, IMO, 2020
15 Getting-to-Zero-Coalition_Insight-brief_Scale-of-investment.pdf (globalmaritimeforum.org)
16 Global Methane Emissions and Mitigation Opportunities, GMI, 2020
17 Curtailing Methane Emissions from Fossil Fuel Operations, IEA, 2021
18 E.g. Methane Guiding Principles, Oil and Gas Climate Initiative, Climate & Clean Air Coalition’s Oil and Gas Methane Partnership
19 Global Methane Pledge, 2021
20 Methane Regulatory Roadmap, IEA, 2021
21 Procurement for Development, World Bank, April 2020