

1.5°C

FOR

SUSTAINABLE FINANCE POLICIES

SUSTAINABLE FINANCE POLICIES

Summary

This guide provides a toolkit of 101 policy levers available to government, regulator, and central bank policy makers to facilitate the transition to net zero.

The climate transition challenge is encapsulated by 1.5°C. Behind the number is a wealth of clear scientific evidence that shows it is a goal we cannot miss.

To reach 1.5°C society must undergo a transition. The transition will offer technological, industrial, and economic opportunities, but the most important opportunity will be political. **The climate challenge offers a political opportunity to steer the real and financial economy towards a green future.**

The green transition will bring economic development, energy sovereignty, and job creation.

Investors have been supporting the transition since 2007, and appetite is growing as illustrated by the rapid expansion of the green bond market, see Figure 1. By greening development plans and investments, global policymakers can harness this momentum and leverage private capital flows to fund infrastructure and development.

Figure 1: annual GSS+ bond issuance



Source: Climate Bonds Initiative

Without rapid climate action, countries will experience a rising cost of capital and stunted growth.

A slow transition will be more expensive than a rapid one. According to the latest research, rapid transition will be economically beneficial due to lower costs of renewable energy technologies compared to fossil fuels without even accounting for avoided costs of climate damages or other climate policy co-benefits.¹

Physical climate risk exposure has increased the cost of capital in vulnerable countries, costing the Vulnerable 20 (V20) nations USD62bn in higher external interest payments over 10 years.² Transition risks are materialising for the 20 sovereigns with the highest ratio of net fossil fuel exports to GDP. These suffered a median net credit rating downgrade of 1.6 notches 2015-2020 and two defaulted.³

Policymakers can ensure a smooth, rapid transition and safeguard development priorities.

Despite the narrowing window to meet 1.5°C, maintaining ambition is crucial to limiting climate change as much as possible. Investment can be channelled to transition with many different instruments in all areas of decision making. Awareness of this variety can increase policy ambition. There is a wealth of policies that can be implemented to direct capital to meet sustainable development needs and deliver climate mitigation and resilience, represented by three pillars:

SPEED: ensure rapid action by all decision makers,

STEER: tilt the whole economy to transition,

SIMPLIFY: clarify and streamline sustainable investment.

Speed: ensure rapid action.

A rapid and smooth transition enables climate mitigation and resilience activities to occur alongside and within economic development. It will also enable growth as a rapid and smooth transition will increase stability, secure voter buy-in and encourage investment.



Policy 1. Align development strategies with climate targets and capture sustainable finance flows to fund economic development. The starting point for these policies is robust national and sectoral emissions budgets, aligned with the 1.5°C global carbon budget. This provides certainty on the speed and depth of transition, encouraging decisionmakers to secure first-mover advantages in the new net-zero economy.

Policy 3. A coordinated sustainable finance roadmap ensures alignment between all government departments, the central bank, and regulators. This also provides investor certainty on policy introduction.

Policy 78. Global collaboration and coordinated action is key to enabling speed of action and facilitating cross-border investment flows.

Steer: tilt economy to deliver transition.

Investment decisions are driven by risk-return evaluation. By proper integration of climaterelated risks and opportunities, traditional investment models can be turned to deliver climate goals and stable and resilient returns.



Policies which tilt investment away from high-risk carbon-intensive and towards green and sustainable investments can insulate economies from climate-related risks and open up green development opportunities.

Redistribution of capital requires a shift in perspective. Recognition of the risks of high-carbon investment will enable its rapid decline and redeployment to sustainable investments. Fossil fuel expansion must cease immediately, as highlighted by the IEA Net Zero Roadmap, and many existing plants must undergo early retirement if we are to meet 1.5°C.⁴

Incorporate transition risk and opportunity into investment decisions.

Exposing climate risk will bring clarity to the green investment opportunities. These policies can also help insulate government and central bank portfolios from climate-related risks.



Policy 94. Require investors and corporates to publish transition plans, as required in UK sustainability disclosures.⁵ This step can prompt immediate action. The government can then introduce risk tools for long-term assessment of transition plans and their impact on exposure. Basing these on robust standards such as the Climate Bonds transition and entity criteria will ensure credibility and speed of transition.⁶

Policy 6. Stop subsidising fossil fuels and damaging ecosystem practices which distort perceptions of climate-related risk. This also frees up a significant level of government spending, which can be reoriented towards transition. Targeted support can prevent adverse impacts on low-income groups.

Policy 81. Central banks recognise climate risk as a risk to financial stability and address it across prudential and monetary policy. Many policies can be adapted to incorporate climate risk considerations without waiting for disclosure and stress testing evidence.

Policy 88. Central banks adjust risk weightings for capital and reserve requirements and collateral frameworks to incorporate climate risks.⁷ This will help insulate the balance sheet from climate-related risk and encourage financial institutions to green their capital allocation.

Policy 8. Carbon pricing reform, removing free allowances and limiting purchase of carbon credits, will ensure that pricing can force change. High and stable carbon prices will ensure investor confidence in the price signal. Overreliance on carbon pricing could hinder transition if it delays implementation of other mitigation policies.⁸ Particularly in emerging markets (EM), non-price instruments may better overcome political economy restraints and avoid regressive impacts on consumers.⁹

Policy 21. Adopt carbon border adjustment mechanisms (CBAM), whereby imports are subject to local carbon pricing are important to avoid relocation of high-carbon activities to countries without pricing schemes.¹⁰

Policy 37. Establish energy transition mechanisms to fund early retirement of fossil fuel assets and their replacement with renewables installations. Energy transition mechanisms can address the financial risks of continued fossil fuel assets operation and create just transition opportunities.

Derisk green opportunities to ensure speed of growth.

While investment will eventually flow to green, risk sharing and diversification will

speed this up, maximising investment opportunities and ensuring climate targets are met. Derisking also ensures investment flows meet sustainable development needs.

Global capital flows are large, but risk appetite is low. Policymakers can mobilise private finance to support higher-risk projects, whether nascent technologies or in EM.

Policy 10. Encourage the use of green and sustainable financial instruments through subsidies and incentives which reduce the cost of green capital and ensure attractive returns.

Policy 18. Project guarantees and credit enhancement provide investors with greater certainty of returns, thereby enabling private investment into projects that would otherwise be viewed as too risky. As much of the capital available for transition is highly risk averse, guarantees are crucial to channel investment to higher-risk projects.

Policy 11. Green bond guarantees can encourage green bond issuance over vanilla and attract international investment.

Policy 13. DM to EM sovereign-to-sovereign guarantees can derisk local currency sovereign issuance and decrease the cost of capital for EM sovereigns.

Policy 19. Increase blended finance provision. Public investment can facilitate the flow of capital to riskier projects by absorbing the higher-risk (junior capital) portion and offering the lower-risk (senior capital) portion to private investors in blended finance deals. This leverages concessional financing to reduce a project's credit risk, allowing for greater mobilisation of private capital. Including other de-risking facilities such as

policy risk hedging can protect from negative market fluctuations and can further increase financing flows, especially important in EM where access to long-term capital is limited.

Policy 45. Targeted subsidies are crucial to enable cost competitivity of specific green technologies and to enable industrial transition. Accelerated depreciation can reduce upfront cost of green infrastructure investments.

Policy 22. Establish preferential green trade windows, with low

tariffs for low-carbon trade. This can compensate for CBAM limitations and facilitate the flow of capital to EM, crucial to the success of the global transition.

Simplify: streamline sustainable investment.

To ensure capital moves to green at scale, policymakers can simplify decision-making and streamline investment processes.

Policy 97. Establish science-based green standards or taxonomies to provide clarity on what a sustainable

investment is and identify green investment opportunities. Including transition standards provides guidance on how to decarbonise high-carbon activities and enables financing of these activities' transition. Aligning with international taxonomies and standards will also enable international private finance flows.¹¹

Policy 33. Minimise potential bottlenecks to investment by fast-tracking permits for green projects, such as renewable energy deployment, and developing regular and replicable auctions.

Policy 101. Green bond segments and fast tracking makes investing in and issuing sustainable instruments easier. This can help overcome inertia.

Policy 59. Carbon credit trade threatens the transition if used to offset avoidable emissions. Market reform can identify qualified offset purchasers and ensure credits are only reserved for residual emissions. Reform can also focus on preserving high-carbon stocks. This will facilitate growth of legitimate carbon credits to fund crucial conservation.

Policy 14. Kickstart change with a sovereign

green bond programme. Sovereign green, social, sustainability, and sustainability-linked bond (GSS+) issuance provides a clear demonstration to market of the pricing and visibility benefits of green bonds, acting as a guide for potential issuers. It draws international investors into the local market. It also enables funding of key government expenditures and encourages government departments to grow their pipeline of eligible expenditures.

101 policy ideas for a sustainable finance policy package



| Department/ policymaker Speed: ensure rapid action Steer: tilt economy to deliver transition Head of government 1. Development plans incorporating climate Incorporate transition risk and opportunity Derisk green opportunities Fiscal policy 3. Sustainable finance roadmap 5. Green public investment management 10. Tax incentives 4. Sustainable central 6. Fossil fuel subsidy phaseout 12. Green finance subsidies | Simplify: streamline sustainable investment 14. GSS+ sovereign |
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| Head of government 1. Development plans incorporating climate 2. Climate target laws Fiscal policy 3. Sustainable finance roadmap 5. Green public investment 10. Tax incentives 4. Sustainable central 6. Fossil fuel subsidy phaseout 12. Green finance subsidies | 14. GSS+ sovereign |
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| hash mandata (marity and the first state of the fir | |
| bank mandate/remit 7. Environmental tax reform 13. Sovereign-to-sovereign guarantees | |
| 8. Carbon pricing | |
| 9. Green sovereign wealth fund | |
| Development 15. Climate bank 16. 1.5 'C-aligned tinance mandate 17. Grant tinance 17. Grant tinance | 20. Green finance facilities |
| 18. Guarantees & credit ennancement | |
| Trade policy 21 Carbon border adjustment 22 Green trade window | |
| mechanism 23. Green export finance | |
| Infrastructure 24. Climate risk integration in 25. Priority infrastructure strategy | 27. Green PPP framework |
| policy infrastructure management 26. Hydrogen clusters | |
| Energy policy 28. RE auction requirements 31. Targeted feed-in tariffs | 33. Streamlined RE permits |
| 29. Fossil fuel plant decommissioning 32. Carbon contracts for difference | 34. Distributed RE |
| 30. Energy transition mechanisms | standards |
| Buildings and 35. Climate-sensitive 36. Renewable energy requirements 39. Incentive schemes | 41. Buildings standards |
| urban policy urban development 37. Green mortgage schemes 40. Green municipal bond issuance | 42. Green planning |
| strategies 38. Land value capture | permission fast tracks |
| Industrial 45. Sectoral emissions 44. Targeted R&D | 49. Transition standards |
| 40. Sectional subsidies and guarantees | anu roaumaps |
| 47. Green public procurement | |
| 48. CCS strategy | |
| Transport 50. ICE phaseout strategy 51. EV incentives | |
| policy 52. Green public transport procurement | |
| 53. SAF mandates | |
| Environmental 54. Conservation value in mitigation and 57. Payments for ecosystem services | 58. Nature-based metrics |
| policy adaptation plans | for financial instruments |
| 55. NBS investment is trategy | 59. Carbon credit market |
| disclosure | reiorm |
| Agricultural 60 Rural development 61 Subsidiv reform 63 Loans and grants for resilience | |
| policy strategies integrating 62. Green preferential tax policy | |
| climate & biodiversity | |
| Social policy 64. Climate risk 66. Gender inclusion in climate finance 67. Green development hubs | |
| communication 68. Net zero jobs strategy | |
| 65. Climate and social | |
| priority alignment | |
| Health policy 69. Climate change 70. Climate action plans including health bandling health bandling | 71. GSS+ issuance funding |
| Defence policy 72 Climate ricks in defence strategies 75 Defence spending decarbonisation | neatur |
| 73. Resilience to volatility | |
| 74. Conflict prevention | |
| Justice 76. Environmental law 77. Climate litigation risk mitigation | |
| enforcement | |
| International 78. International 79. Climate diplomacy | 80. Capacity building |
| relations collaboration | |
| Monetary 81. Green asset purchases 85. Green credit guidance Policy Policy Policy Policy | |
| Oliatoral framework adjustment | |
| 84. Climater all real real real social sectors | |
| Prudential 86. Stress testing | 90. Sustainable finance |
| regulation 87. Climate disclosure requirements | research & analysis |
| 88. Capital & reserve requirements | |
| 89. Carbon capital buffer | |
| Supervisors 91. Climate 93. Climate disclosure requirements | 97. Standards |
| and regulators consideration 94. Transition plan assessment | 98. GSS+ bond guidelines |
| | 99. Green regulatory |
| requirements 95. Stock exchange listing requirements 02. Desculators (/Dianage) 06. Descue on a listing requirements | candhovec |
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List of Acronyms

| ASEAN | Association of South-East |
|-------|---------------------------------|
| | Asian Nations |
| СВ | Central bank |
| СВАМ | Carbon border adjustment |
| | mechanism |
| CCfD | Carbon contract for difference |
| ccs | Carbon capture and storage |
| CO2 | Carbon dioxide |
| DFI | Development finance institution |
| DM | Developed Market |
| DRE | Distributed renewable energy |
| ECB | European Central Bank |
| EM | Emerging Market |
| ESG | Environmental, Social |
| | and Governance |
| ETS | Emissions trading scheme |
| FI | Financial institution |
| FiT | Feed-in-tariff |
| GDP | Gross domestic product |
| GHG | Greenhouse gas |
| GSS+ | Green, social, sustainability |
| | and sustainability-linked |
| IEA | International Energy Agency |
| IPCC | Intergovernmental Panel on |
| | Climate Change |
| IPSF | International Platform on |
| | Sustainable Finance |
| KPI | Key Performance Indicator |
| MDB | Multilateral development bank |
| MoF | Ministry of Finance |

| NBS | Nature-based solutions | | | |
|--------|-------------------------------------|--|--|--|
| NDB | National development bank | | | |
| NDCs | Nationally Determined Contributions | | | |
| NGFS | Network for Greening the | | | |
| | Financial System | | | |
| OECD | Organisation for Economic | | | |
| | Co-operation and Development | | | |
| PBOC | People's Bank of China | | | |
| PE | Private Equity | | | |
| PES | Payments for ecosystem services | | | |
| PPP | Public-private partnership | | | |
| R&D | Research and development | | | |
| RE | Renewable Energy | | | |
| SLB | Sustainability-linked bond | | | |
| TCFD | Taskforce on Climate-related | | | |
| | Financial Disclosures | | | |
| TNFD | Taskforce on Climate-related | | | |
| | Financial Disclosures | | | |
| UNFCCC | United Nations Framework | | | |
| | Convention on Climate Change | | | |
| UoP | Use of proceeds | | | |
| V20 | The Vulnerable Twenty Group | | | |
| VC | Venture capital | | | |
| VCM | Voluntary carbon market | | | |
| | | | | |

The world of sustainable finance

SUSTAINABLE FINANCE

Contributes to climate mitigation and adaptation, wider environmental protection (e.g., biodiversity, water quality), and/or social development.



GREEN FINANCE

Supports activities which contribute to climate and other environmental objectives.

CLIMATE FINANCE

Supports climate mitigation and/or adaptation.



TRANSITION FINANCE

Supports an entity or activity's transition to net-zero alignment and climate resilience.

SOCIAL FINANCE

Supports social development and equality.

Context: the need for rapid climate action

The impacts of climate change and environmental degradation on our economies are hugely complex. They are widespread, heterogeneous and will result in dangerous feedback loops and amplifiers.

The Intergovernmental Panel on Climate Change (IPCC) asserts that **human-induced climate change is already resulting in severe physical hazards**. Limiting warming to 1.5°C is necessary to avoid catastrophic human, ecosystem, and financial impacts. Whilst the 1.5°C goal is still within reach, the window to meet it is shrinking.¹²

Climate-related risks are transmitted through the micro and macroeconomy to pose a financial risk, see Figure 2. Unmitigated climate change could cost the global economy USD178tn over the next 50 years.¹³

In addition to economic losses from climate hazards, countries may see rising costs of borrowing, limiting growth. Physical risk exposure has **already increased cost of capital** in vulnerable countries – by 117bp in the V20, costing USD62bn in higher external interest payments over 10 years.¹⁴

Transition risks will have an impact as international lenders look to reduce their fossil fuel exposure. Climate change stranded-asset risk is material for sovereign creditworthiness and ratings. Major fossil fuel exporting sovereigns suffered a median net downgrade of 1.6 notches in 2015-2020 and two defaulted.¹⁵ The Australian Treasury attributes its net-zero decision partly to concerns about potential penalties for its cost of capital, arguing that without such a plan and consequential access to capital markets now focusing on green, its borrowing costs could increase by 100 to 300 basis points.¹⁶

Current climate policies and government commitments are inadequate. Policies implemented up to the end of 2020 result in global warming of 3.2°C by 2100.¹⁷ At these temperatures, climate extremes and sea level rise will threaten human health and economic functioning. In addition, without biodiversity and ecosystem protection, marine and terrestrial carbon sinks are at risk, with potential for greater levels of atmospheric carbon dioxide (CO₂) and warming. Physical and economic feedback loops, such as destabilisation of the ice sheets causing catastrophic melting or lending restrictions reducing adaptive capacity, could further increase severity of impacts.¹⁸

Delayed and uncoordinated action poses significant risks to growth.

All policy decisions now need to be taken in the context of rapid climate change, and rapid



Figure 3: Annual CO₂ emissions and global temperature change under NGFS orderly and disorderly transition scenarios



transition – while physical climate risks are emerging even faster than expected, so too are climate policies and their ramifications. In all areas of responsibility, policymakers need to expect volatility. Delayed action, i.e., after 2030, will require much more severe policies to limit carbon emissions, sudden technology shifts and likely see the carbon budget exceeded before emissions fall. This disorderly transition increases both physical and transition risks, see Figure 3.¹⁹ At the national level, delayed action could erode growth opportunities and increase costs for a country. This is because other countries' action on climate change will attract greater investment, reshape supply chains, and reduce fossil fuel demand.

Rapid transition is essential to minimising this volatility. An orderly transition sees early introduction of climate policies, with a gradual ramp up in stringency. By immediately reducing carbon emissions, physical climate hazards are lessened, as are transition risks.

Current investment allocation models underestimate climate risks and opportunities.

All countries will need to **leverage a significant level of private investment** to close the netzero investment gap; estimates suggest that climate finance needs to increase sixfold to over USD4tn by 2030, see Figure 4.²⁰

There is **sufficient global capital and liquidity to close these investment gaps**; the global bond market alone is approximately USD130tn outstanding.²¹ However, market failures in the risk-opportunity assessments that underly investment allocation mean that these currently result in investment flows being dominated by fossil fuels and other carbon-intensive sectors. **Backwards looking or short-term assessments overvalue fossil fuel investments**, due to their

strong historical performance.

Demand for green investments is high but investor risk appetite is also too low for many of the key sustainable investments that are essential to transition, such as those in innovative technologies or emerging markets. Without policy intervention to reduce risk, global financial markets will not deliver deep decarbonisation and certain regions may be left behind in transition.

Complex sustainable investment processes could hinder transition.

Lack of **clarity** over what are credible green and sustainable investments can disincentivise investors due to greenwashing fears or lack of capacity to assess investment credibility. Additional regulations and due diligence for sustainable investment and overcomplexity of climate and sustainable finance policies could also present a barrier to action.

Sustainable investment can require more work than high-carbon due to additional regulations and due diligence. This discourages those without a specific green investment mandate. If sustainable investments are substantially more **complicated** than high-carbon investments, capital will not move at scale. Not only must

Figure 4: The net zero investment gap



simplicity be prioritised in all policies, but policymakers will also need to **facilitate investment** by providing guidance and by creating scalable financial structures.

An economy-wide sustainable finance package can help meet 1.5°C.

This report outlines how a sustainable finance policy package, implemented across the government and regulators, can address these issues.

1. Avoiding delayed transition risks: policies to **ensure rapid action** by all decision makers.

2. Addressing climate risk and opportunity underestimation: policy to steer the economy to transition, by **incorporating climate risks** and opportunities and derisking green opportunities.

3. Reducing complexity: policy to **simplify sustainable investment processes**.

Sustainable finance policy recommendations are made for government policy makers, by department, central banks, and regulators. Within each section, they are organised by the above highlighted ambitions to **speed**, **steer**, **and simplify** investment.

The table on page 4 provides an overview of the policy recommendations, following the same structure.

A scientific foundation for climate finance policies.

Before implementing a policy framework to green investment flows and align their economies with a 1.5°C future, policymakers need to know what they are aiming for. This requires science-based emissions reduction targets; a net-zero target, and interim goals that reflect the national carbon budget. **Short-term emissions reduction targets** are crucial to ensure the rapid decarbonisation that must occur this decade to limit warming to 1.5°C.²²

According to the IPCC, emissions associated with the full implementation of Nationally Determined Contributions (NDCs) as announced before COP26 will likely warm the planet more than 1.5°C. In addition, current implemented policies will likely result in still higher emissions – suggesting an implementation gap. Therefore, governments need to both increase the ambition of NDCs and **implement more stringent policies to meet them**.

Climate policies lag behind the scientific understanding of what is required to avoid catastrophic climate change. Policymakers and scientists need to find modes of collaboration to ensure science informs the policy-making process.

Climate finance can help governments **increase the ambition of their NDCs**. The policies outlined below will enable policymakers to reorient existing investment flows to align with a 1.5°C future and to harness private finance to meet decarbonisation needs.

Accompanying emissions targets with **sectoral emissions budgets**, in line with the IPCC carbon budget for 1.5°C, will drive corporate and investor decarbonisation pathways and transition planning. These sector budgets can then inform sectoral policies.

Central government policymakers

Head of government

The transition to net zero will involve a significant transformation of all elements of the global economy. Securing public support for the transition is crucial to

enabling the smooth implementation of the policies set out below. It requires awareness of both the threats of climate change and the opportunities offered by the transition, creating an understanding of how socioeconomic development requires climate action. The political levers to do this will vary between countries. For example, some EM may emphasise development benefits and wealth creation of transition, whereas other countries may highlight the impact of climate change on human health.²³

POLICY 1. **Development plans** incorporating climate



Climate adaptation and mitigation are closely linked with development pathways. Incorporating climate goals into national development plans will embed climate action across

all sectors. In particular, this can ensure adaptation and resilience are embedded in development. For example, Nepal's national development plan for 2019/20-2023/24, reflects its climate change goals closely. Key elements of its NDC, such as accelerating renewable energy investments, scaling up electric vehicles and associated infrastructure, development of electric rail network, and forest conservation, are well integrated in the Plan. Climate adaptation considerations are also explicitly addressed in relevant sectors.24

Developing specific climate adaptation plans can also help address the investment gap seen for adaptation and resilience. The UNFCCC Cancun Adaptation Framework established a process that enables Parties to formulate and implement national adaptation plans. This enables the identification of medium- and long-term adaptation needs and development of strategies to address these.25

Government leadership and policy units can work to coordinate action across government, not just to provide direction but also to ensure coherency of policymaking.²⁶ They can promote intra- and interdepartmental policy coherence and coordination, and interagency policy coordination. Several governments have created "superministries" to better formalise internal coordination and overcome tensions between departments. This can also streamline policymaking, reconciling those with the same objectives to ensure there are not multiple policies working to enable the same capital flows. For example, Denmark is undertaking a net zero review in every government ministry.

This position of oversight means government leaders hold responsibility for ensuring sufficient ambition in policies and NDCs, following the science, as outlined above. They should also ensure commitments are followed through and not watered down or delayed.

POLICY 2. Climate target laws

Policy certainty is crucial to derisking green investments.

Putting climate targets into law provides confidence in the stickiness of these and other climate commitments, reducing the likelihood that such targets may be reversed with a change in administration. In addition, phaseout plans for temporary policies such as subsidies to bring green technology costs in line with high-carbon technology costs must be clearly communicated. The UK independent net-zero review highlighted the common need for 'clarity, certainty, consistency, and continuity from government,' and a stable long-term investment plan.27

Fiscal policy

Fiscal policies are key to decarbonisation as they influence all areas of the economy. Allocation of government expenditure, implementation of taxation, and

structuring of government borrowing can tilt the economy towards green and sustainable growth. The Ministry of Finance (MoF) decides fiscal policy, provides financial oversight, and determines financial strategy. Embedding climate change in the MoF mandate and enacting key legislation such as climate laws are key to mainstreaming climate action in all functions of the MoF.²⁸

The Coalition of Finance Ministers for Climate Change emphasises the importance of long-term strategies to mainstream climate into economic and financial policy.²⁹ Sovereign issuance can also enable ministry coordination, due to the need to collaborate on green expenditure identification.

POLICY 3. Sustainable finance roadmap



The strategic role of the MoF

is key to coordinating whole government action on climate change. This is important to prevent inefficiencies and ensure sufficient speed of action. While cross-government alignment will stem from top-level decisionmakers, the MoF can ensure day-to-day coordination, for example through oversight of ministerial and sub-national government budgets.

The MoF, with the support of the central bank and regulators, can create a sustainable finance roadmap, providing direction to ministries, regulators, and other related entities. In certain contexts, the regulator may be better positioned to lead on roadmap development than the MoF. Such a roadmap can provide clear market signals on the introduction of policies, providing investor certainty and long-term clarity.

Roadmaps can be highly complex. For example, the UK's Green Finance Strategy aims to not only green the financial system but also increase financing flows to green technologies, incorporating the UK Industrial Strategy and international commitments.³⁰ However, they can also have a narrower focus, such as Brazil's Roadmap for implementation of TCFD recommendations.³¹ NGOs and consultancy firms are often enlisted to develop roadmaps. EM governments' sustainable finance roadmaps are often developed with multilateral development bank (MDB) or foreign government support, such as the Philippines Roadmap.³²

Roadmaps can also help all stakeholders to see the bigger picture and galvanise action, overcoming inertia and short-termism that can stifle action on climate change. A roadmap can ensure coordination - see for example, the EU Action Plan on Financing Sustainable Growth (now Renewed Sustainable Finance Strategy); which aimed to coordinate the introduction of the Green Taxonomy and corporate and financial disclosure regulations.³³ The Green Finance Platform and UNDP Financial Center for Sustainability's Sustainable Finance Diagnostic Toolkit could be used to kickstart roadmap development.³⁴

Aligning and embedding sustainable finance roadmaps in long term investment and development strategies will further ensure coordination, enable the government to leverage private capital to deliver development and embed sustainability in wider development plans.

POLICY 4. Sustainable central bank mandate/remit

The MoF also tends to set the mandate and remit of the central bank. Most central bank mandates are to maintain price or financial stability, and this can be seen as limiting their ability to address climate risks. The MoF can clarify the mandate, to make clear that climate-related risks are in a central bank's remit and impact financial stability. In 2021, the UK Treasury clarified the Bank of England's role in supporting the transition to a net-zero economy.³⁵ In response, the Bank committed to greening its Corporate Bond Purchase Facility, reducing carbon intensity by 25% by 2025 and aligning it with net zero by 2050, stating that the remit change enabled this monetary policy update.36



The MoF could also set a secondary mandate, of sustainable development or other such climate-aligned objective. Such secondary mandates are common among EM central banks. There is precedent for mandate change in the face of huge financial risk. Before the GFC, very few G20 central banks had a financial stability mandate. Most had a singular, price stability mandate. By 2020, most had a double or multiple mandate, with a significant uptake of financial stability objectives.³⁷

POLICY 5. Green public investment management



By aligning all elements of the budget with the decarbonisation pathway, expenditure can be insulated from climaterelated risks, targeted to overcome challenges of transition, and ensure efficient integration of environmental and development priorities.

Increasing levels of green public investment will be needed to deliver climate mitigation and adaptation goals. Green public investment management ensures investment is best targeted to climate change needs. This requires five key elements:

- Climate-focused national planning: aligning sectoral plans and associated portfolios with climate objectives.
- **Public sector coordination:** across all public sector institutions and any joint ventures with private actors.

- Ensuring climate adaptation and mitigation assessments are included in project appraisal and selection.
- Budgeting for and reporting on green investment in the annual budget: tagging climate expenditures, etc.
- Incorporating climate risks in natural disaster risk management strategies and fiscal risk analysis.³⁸

These are covered by many of the policies outlined in this report. This approach ensures climate action is consistent and aligned and can help governments identify where public investment is most needed, i.e., where private finance cannot be leveraged. National green standards and/or taxonomy (policy 97) can be used to direct green public investment. The EU Recovery and Resilience Fund Regulation required that member states' Recovery and Resilience Plans do not lead to significant harm to the EU Taxonomy's environmental objectives.³⁹

Green budget tagging can be used to assess budget alignment with climate commitments. It can also be carried out as part of the process of sovereign green bond issuance, to identify eligible use of proceeds for the bond. In 2020, France was the first country to carry out green budget tagging, as part of the OECD Paris Collaborative on Green Budgeting. Environmental expenditures came to EUR52.8bn of EUR574.2bn budget and tax expenditures.⁴⁰ While tagging can inform policymakers and monitor action, it does not

Figure 5: Green Public Financial Management – integrating climate considerations throughout the budget cycle



drive action. Green budgeting can use the results of this assessment to improve the alignment of expenditure with environmental goals and for ex-post reviews of climate outcomes of government expenditure. This is often in the form of environmental impact assessments.

Green public financial management adapts existing public financial management practices to support climate-sensitive policies. This gradually promotes climate-

sensitive fiscal policies throughout and beyond the budget cycle, see Figure 5.

By looking to green all elements of financial policymaking, this can also help ensure fiscal efficiency, ensuring greatest environmental returns of policies. It could also highlight fiscal inefficiencies, such as maintaining fossil fuel subsidies while implementing carbon pricing. Effective implementation requires political backing for the reform with the MoF taking on a strong stewardship role.⁴¹

These three approaches have strong complementarity and overlap. Public investment needs and institutional strengths will determine which is used.

POLICY 6. Fossil fuel subsidy phaseout

Phaseout of fossil fuel subsidies ensures clarity of signals on climate, disincentivises fossil fuel investment, and frees up budgetary space for other investments. Government support for fossil fuels (budgetary transfers and tax breaks linked to production and use) rose above USD1tn in 2022, driven by high fossil fuel prices.⁴² Impact of phaseout will vary widely depending on each country's circumstances. A clear phaseout plan, including reallocation and transition support, is important to prevent economic shocks from the removal of subsidies, and ensure buy-in from the population.

Additional support may be required for the most vulnerable, as low-income households spend a larger proportion of their income on fuel. Kazakhstan's sudden halting of liquified petroleum gas subsidies was met with mass protests, with the government resigning three days later. In contrast, Singapore eliminated petrol subsidies in 2015, at a time of low fuel prices and reallocated the spending to social development. This demonstrates the need for clear communication of timelines of phase out and its social benefits and reallocation of spending.⁴³ Given current and likely sustained elevated fuel prices, phaseout plans require mitigatory measures to minimise adverse social impacts.

POLICY 7. Environmental tax reform

The transition will impact fossil fuel production and consumption tax revenues.

In some countries, fossil fuel production tax revenues account for over 50% of government revenues. The decline of these revenues could also be exacerbated by price shocks. Carbon taxation cannot be relied on to substitute these revenues, as these tax incomes should tend towards zero as the transition progresses. Tax systems will need to be redesigned, and new revenue sources explored as green technologies become competitive and mainstreamed.⁴⁴

Environmental tax reform (ETR) is closely related to carbon pricing. It involves the introduction of environmental taxes on pollution, energy and/or resources, and the introduction of expenditure policies. This both discourages environmentally damaging activities and raises revenue for public investment. ETR is particularly well suited to developing countries as it can have a "triple bottom line" effect: cutting pollution, generating and funding development and raising economic activity. It can be used to facilitate a Just Transition, mitigating climate impact whilst raising welfare.⁴⁵

Governments can receive policy-based loans from development banks to support policy reform or institutional changes. Inter-American Development Bank provides financing to modernize fiscal policy as well as sector-specific reform.⁴⁶

POLICY 8. Carbon pricing

Carbon pricing, through a carbon tax or emissions trading scheme (ETS) is implemented to capture the external cost of greenhouse gas (GHG) emissions and charge this to emitters. This can improve the business case for green technologies and incentivise emissions reductions. The OECD has calculated that introducing a EUR10/tCO2 carbon price could reduce a country's emissions by 7%.⁴⁷ By covering all sectors, it will incentivise action across the economy.

Design of the pricing instrument will impact price stability and value. A carbon price that is stable and high enough to prompt action will encourage clean investment. Carbon price volatility will discourage green investment. Therefore, a hybrid approach to carbon pricing, such as an ETS with a fixed price floor, emissions cap, and price ceiling, can increase emissions reduction certainty and provide predictable prices. For example, a carbon price floor was introduced in the UK in 2013, requiring power generators to pay a minimum carbon price.⁴⁸

Concerns over carbon leakage, the relocation of carbon-intensive industries to avoid pricing, have been a barrier to carbon price introduction. While many jurisdictions have provided free emissions credits to certain industries, this weakens the price signal. Instead of issuing free allowances or exempting certain industries from pricing, governments can address carbon leakage through carbon border adjustment mechanisms (policy 21). Clear roadmaps for phaseout of free allowances and/or extension of pricing to other sectors will provide certainty and increase the incentives to invest in green.

An international carbon price floor has also been proposed by IMF staff, suggesting a floor of USD25-75/tCO2 by 2030, depending on their level of economic development.⁴⁹ This would provide long-term green investment certainty globally and help to address carbon leakage concerns.

It is important not to be over-reliant on

carbon pricing to drive transition. Other policies are required to overcome market failures and problems of inertia, increase the green asset pipeline and channel funding to transition the whole economy. Accompanying carbon pricing with policies such as fossil fuel phaseout strategies will also prevent incremental change in response to the carbon price and provide a clear signal on the future of the carbon price. Particularly for EM, non-price instruments such as standards, regulations and subsidies may be more effective in overcoming market failures and in developing infrastructure. They can also overcome EM political economy constraints as costs to citizens are less visible and less regressive than pricing.⁵⁰ An exclusive focus on carbon pricing may also even delay the deployment of other mitigation policies, increasing the cost of transition.⁵¹

POLICY 9. Green sovereign wealth funds

Tilting government asset holdings, such as sovereign wealth funds, to green will not only increase financing of the sustainable transition, but also improve the resilience of these funds to climate-related risks. Sovereign wealth funds are created to facilitate intergenerational transfer of wealth. The negative climate impacts on future generations give these funds a clear motive to green their portfolios. Increasing green and sustainable investment allocation of these funds can also provide an example to private investors.

Governments are increasingly diversifying the revenues of these funds away from oil and gas assets. New Zealand's sovereign wealth fund has reduced its emissions intensity by 50%, and in 2022 shifted 40% of its holdings to Paris-aligned indices, committing to a 7% annual CO2e reduction.⁵² Norway's sovereign wealth fund, which owns 1.5% of the world's listed assets, introduced an environmental mandate program investing in green bonds, but has since removed it, instead committing to reduce the climate risk of the entire fund.⁵³ 3/4 of the International Forum of Sustainable Wealth Funds have only 10% holdings in climate-related strategies. Introducing net-zero targets for their sovereign wealth funds is a clear opportunity for governments to help fund their net-zero transition.⁵⁴

Beyond reducing the carbon intensity of sovereign wealth funds, they can be leveraged for strategic long-term investment in the net-zero transition. Such funds could be partially dedicated to or fully transformed into environmental trust funds, dedicated to providing long-term investment in net zeroaligned projects. These funds could be used to finance PPPs, discounted loans, tax exemptions, blended finance or other government expenditures for the transition outlined in this report. Sovereign wealth funds therefore can use historic fossil fuel incomes to facilitate the transition to net zero. Governments can also establish new funds to encourage action. In 2005, Korea's MoF established the Korea Fund of Funds. This provides seed funding to local fund managers to boost SME and venture capital investments.⁵⁵ A MoF could set up a similar fund to prioritise sustainable investments.

POLICY 10. Tax incentives

Tax incentives can be used to increase green and sustainable

investment. For example, by making the interest from green bond holdings tax-exempt. This could follow the model of tax exemption for US municipal bonds. Tax credit bonds could also be used; bond investors receive tax credits instead of interest payments, so issuers do not have to pay interest on their green bond issuances. These incentives can help tilt investment to green and the resulting increase in investor interest and demand will encourage issuers to issue green bonds. Luxembourg reduces the subscription tax rate for investment funds according to their level of EU Taxonomy alignment.

Accelerated depreciation for green infrastructure can decrease the upfront cost of green investments by allowing greater tax deductions in early years of an asset. For example, India introduced an accelerated depreciation tax benefit for RE developers 1994-2012 and again in 2014. To ensure impact of such policies, tax incentives should be linked to performance. The India policy rewarded capacity additions, not generation increase, which encouraged inefficient installations. Policies should also support wider infrastructure, such as transmission, and include clear phaseout plans as technologies mature and require less risk mitigation.⁵⁶

Policy risk insurance can be provided to improve the investibility of projects. Policy supports such as tax incentives carry a removal risk. As this risk is posed by the public sector, the public sector is well placed to insure against it.



POLICY 11. Green sovereign guarantees

The MoF can derisk green bond issuance by providing green sovereign guarantees.

Partial risk guarantees, or "wrappers", lend the government credit rating to the issuance while liquidity guarantees allow the extension of debt tenor. This enables access to institutional investors and lowers the cost of borrowing, thereby encouraging private sector green bond issuance over vanilla issuance. Multi-sovereign guarantees such as through the Global Climate Partnership Fund can also achieve higher leverage ratios.

Guarantees do hold a liability risk and require sufficient balance sheet liquidity to ensure MoF's ability to fulfil the guarantee if called upon. The MoF will need to minimize the potential large liabilities of such guarantees, particularly in EM countries. Robust monitoring mechanisms can ensure that guarantees and other blending mechanisms do not exceed balance sheet capacity.⁵⁷

POLICY 12. Green finance subsidies

The government can also provide subsidies to green bond issuers. Interest rate subsidies, or stamp duty exemptions could be applied to green bond issuance. However, such a policy faces a risk of subsidy allocation being dominated by large corporates which do not require subsidies. Reserving such polices for where it is most needed, i.e., SMEs, ensures the efficacy of such spending. Subsidies can also cover the cost of verification and external review. While these costs are a small portion of issuance for large issuers, these might be a barrier to smaller issuers. Several local governments in China have introduced green bond subsidies, as part of the People's Bank of China (PBOC) green finance pilot zones.⁵⁸ Singapore's Green and Sustainability-Linked Loan Grant Scheme covers the cost of assessment and verification and up to 60% of the cost of framework development.⁵⁹ HKMA co-funds half of eligible expenses (up to HKD2.5m) for a first-time issuer, and 100% (up to HKD800,000) for green loan borrowers or repeat issuers.⁶⁰

POLICY 13. Sovereign-to-sovereign green guarantees

The high investment risk and low credit ratings of some sovereign issuance can be addressed by sovereign-to-sovereign green guarantees, provided by developed market (DM) governments on EM green sovereign issuance. These could follow the model of MDB guarantees to sovereign issuance. DM sovereigns could leverage their own balance sheet and credit score to de-risk investment in EM sovereign green bonds. A guarantee from a sovereign with a strong balance sheet and credit score would increase investor confidence, and de-risk the issuance, enabling risk-averse institutional investors to purchase the EM green bond. This would optimise balance sheet capacity, as capital would be tied up for a shorter amount of time than with a standard loan. This would also decrease the cost of capital for the EM sovereign, as such bonds would likely receive higher valuations. Guaranteeing local currency issuance would also provide resilience to (USD) exchange rate volatility.

Guarantees can also be accompanied by capacity building. Guarantors can share their own experience in developing green bond frameworks and provide assurance to international investors.

The US government has provided guarantees on sovereign bond issuance. For example, in 2017 it provided a 100% guarantee of the repayment of principal and interest for a USD1bn Iraqi sovereign bond, as part of a wider international assistance package.⁶¹ Such guarantees have historically included conditionality, therefore a green sovereign guarantee program could be very similar to this precedent.⁶²

The MoF is well positioned to overcome a major constraint to sustainable investment, which is a lack of investible projects. Identifying/creating a pipeline of green investments is important for sovereign green bond issuance, but can also be done strategically for blended finance, MDB or private investment. The MoF can coordinate with other government departments to establish this pipeline. The MoF is also able to negotiate costefficient financing from MDBs which can kick start blended financing solutions for the market.

POLICY 14. GSS+ sovereign issuance



Sovereign bond issuance is an important function of the MoF and can provide long-dated funding, particularly well-suited to the infrastructure and other long-term capital investments needed for transition.

GSS+ sovereign issuance allows governments to leverage private finance to overcome the net zero financing gap. In addition, proceeds often fund expenditures linked to policy measures such as grants, subsidies, and tax credits which leverage even more private investment. Green bonds attract a wider investor base than standard issuance (i.e., vanilla). This can also lead to tighter primary market pricing, also known as a greenium, offering issuers lower borrowing costs. By the end of 2022, Climate Bonds had recorded sovereign GSS+ bonds from 43 countries, many of which had issued multiple times, and under multiple thematic labels.

The Climate Bonds Sovereign GSS Bond Survey identified catalysing a local GSS+ bond market as both a motivation for, and an outcome

of issuing. Sovereign green bonds provide benchmark pricing and liquidity for corporate issuers, enabling them to estimate demand and pricing for their bonds, and inform size of issuance. In 2021, the UK issued its debut green gilt and saw 79% growth in corporate green bond issuance the same year. Another key motivation is to diversify the investor base, while many issuers reported reputational and visibility benefits. Both DM and EM issuers found the benefits to outweigh the challenges of issuance.⁶³

Sovereign issuance increases transparency, as it involves green budget tagging and can reveal gaps in policy, for example, Chile's issuance prompted an improvement in building codes.



Figure 6: Total GSS+ sovereign debt issued/year, and % labelled debt of global sovereign issuance

Social, sustainable, and sustainability-linked issuance has seen substantial growth in EM, see Figure 7. Sustainable bonds combine green and social expenditures, helping to tackle the perception that green transition could hinder economic development. For example, Thailand's TBH50bn (USD1.6bn) sustainability bond funded both the construction of an electrified rail line of the Bangkok metro and social projects, including the COVID-19 Rehabilitation Package supporting employment.⁶⁴ Sustainability bonds can fund important social infrastructure but also enable communication of the developmental benefits of green investment and transition.

Countries without sufficient green expenditures could issue sustainability-

linked bonds (SLBs). Rather than funding specific expenditures, SLBs are linked to a set of KPIs, motivated by a coupon change contingent on whether those KPIs are met. The World Bank has issued guidance on sovereign SLB design.⁶⁵

Chile issued the first-ever sovereign SLB in March 2022. The USD2bn deal used the KPIs recommended by the World Bank. They target emissions reduction of 15.4%, a peak by 2030 and a 60% renewable energy (RE) installed capacity by 2032. If these KPIs are not met, coupon step ups of 6.25bp and 12.5bp from 2030/2032 will be triggered.⁶⁶ Chile's emissions reduction targets are aligned with its NDC and a below 2°C scenario but require an increase in ambition to align with a 1.5°C pathway. Establishing meaningful KPIs gives credibility to the SLB's ambition.

MDBs and other actors can support sovereign issuance at all stages of the process. Climate Bonds Initiative supported the development of Italy's and Chile's green bond frameworks and eligible expenditure identification.⁶⁷ The World Bank's support of the 2018 USD15m Seychelles blue bond included a partial credit guarantee of USD5m and a loan to cover transaction costs. It also connected Seychelles with banks and investors.⁶⁸

GSS+ bond issuance can fund adaptation and resilience which are mostly publicly funded.

Resilience investments tend not to directly generate income but result in significant savings due to avoided damage from climate hazards. 90.6% of proceeds from Fiji's 2017 green bond were dedicated to adaptation, with climate resilience cited as the driving cause of the issuance. Use of proceeds (UoP) included reconstruction of schools damaged by 2016's Tropical Cyclone Winston, agricultural resilience to drought and flood, and adaptation research.⁶⁹ A sovereign could issue a resilience bond, a green bond dedicated exclusively to resilience funding. The EBRD issued the first resilience bond in 2019, and as of February 2023 a sovereign had yet to do so⁷⁰ Sovereign issuance could also fund ecosystem protection which does not often generate direct income streams but provides important benefits of enhanced carbon sinks, natural hazard protection and economic cobenefits. See Environmental policy for more.

Resilience investments and green bond UoP can be guided by the Climate Bonds Climate Resilience Principles, as used by the EBRD for their 2019 bond.⁷¹ These high-level Principles will soon be followed by a Resilience Taxonomy, providing granular guidance on what is a credible resilient investment for green issuance.

The Coalition for Climate Resilient Investment has developed the Jamaica Systemic Risk Assessment Tool, enabling analysis of climate risks and future impacts, to establish future economic losses. This quantification can help make the case for investment in resilient infrastructure and activities and encourage private investment in resilience.⁷²

A highly indebted MoF may be unwilling to issue more government debt and further increase their debt to GDP ratio and associated risks. It could instead restructure existing debt as an SLB, bringing clear accountability and transparency to a country's progress towards the achievement of its NDCs, and possibly securing more favourable interest rates.

The European Commission's plans for reform of EU economic frameworks to reduce debt levels aim to ensure sustainable growth. MS will need to define medium-term investment priorities.⁷³ Requiring these to favour green will help embed climate priorities in long term economic frameworks.

MoF could also investigate the possibility of debt for nature swaps, to reduce their debt to GDP ratio, while also meeting their climate goals. A creditor country agrees to write off a portion of debt on the condition that the debtor country carries out conservation activities. This can prevent environmental damage occurring in debtor countries as they increase exports of natural resources to pay off their debt.⁷⁴ Debt-for-nature swaps can be multilateral or involve an NGO. For example, Belize made a USD553m debt for nature swap in 2021, buying back its debt at a significant discount in exchange for increasing marine conservation efforts. This reduced external debt by 30% of GDP and was financed by a blue bond issued by The Nature Conservancy and insured by the US International Development Finance Corporation.75



Figure 7: Total developed and emerging market sovereign GSS issuance

Development finance policy

National development banks (NDBs) are state-owned banks that provide financing to further the country's economic development. The MoF or another relevant department



oversees the NDB. They can help ensure ambition on climate, by prioritising sustainability and climate transition in their development strategies.76

Development finance plays an important role in supporting socioeconomic development and widening access to finance. Public financial institution investments total USD2.2tn annually, offering cheaper financing and wider technical assistance to governments and the private sector. They have unique abilities to support the transition to a 1.5°C world and are increasingly focusing on enabling sustainable development and meeting the SDGs.77

POLICY 15. Climate bank development



To align development finance with a 1.5°C pathway, policymakers can establish or transform NDBs into green/climate banks, integrating climate goals into their

developmental goals. These can help meet the specific financing requirements of the net-zero transition and send a signal of national intent to align all investment with net zero. For example, the European Investment Bank's Climate Bank Roadmap 2021-2025 aligns the bank with the EU's climate commitments, establishing it as Europe's climate bank. It set out two objectives, to dedicate 50% of its overall lending activity to climate action and environmental sustainability by 2025 (achieved in 2021), and to ensure "all financing activities are aligned to the goals and principles of the Paris Agreement by the end of 2020".78

A roadmap can also be established to align NDBs with NDCs, to decarbonise lending and scale up sustainable financing while still funding social development.

POLICY 16. 1.5°C-aligned finance mandate



Policymakers can mandate NDBs to dedicate an increasing proportion of funding to green and set clear deadlines for ending financing of fossil fuels and other damaging practices. This also prevents shocks from sudden withdrawal of funding. To align development with 1.5°C, development finance can be guided by a national Taxonomy, or the MDBs and IDFC's joint Common Principles for Climate Mitigation Finance Tracking.⁷⁹ For example, the EIB's green activities are defined by the 1st Delegated Act of the EU Taxonomy.⁸⁰

POLICY 19. Blended finance

Blended finance is an important tool as the structure provides support from the beginning to the end of a project. Concessional financing is provided to reduce, but not eliminate, a project's investment risk that could otherwise prevent commercial bank lending.

In blending, development finance can provide grants of capital (either refundable or gifted) and/or equipment and training. These grants significantly reduce project risk for the commercial lender. To further reduce risk, the blended finance deal could also involve a guarantee.

Development finance will be critical to financing adaptation. Climate finance is currently dominated by mitigation, 65% in 2021.⁸¹ Increasing the financing going to adaptation and embedding climate resilience requirements into all projects will deliver global adaptation and insulate development finance investments from climaterelated risks. The African Development Bank's Adaptation Benefits Mechanism allows Adaptation project developers to sign off-take agreements for payment upon delivery of certified adaptation benefits and use those agreements as collateral for raising finance. This provides an additional revenue stream to finance adaptation.82

POLICY 17. Grant finance

Development finance is often concessional, although

development finance institutions (DFIs) are now increasing blended finance provision to leverage greater levels of private finance. Grant financing remains key to fund high-risk projects and those without clear revenue flows, and to avoid increasing the debt burden of highly indebted countries.

Development finance can increasingly mobilise private capital for transition. DFIs traditionally hold infrastructure assets to maturity, with around USD60bn of such assets on their books. However, once such assets become operational, investment risk is lower and potentially attractive to private investors.⁸³ Financial innovation would allow DFIs to sell assets to private investors, freeing up balance sheet space to enable greater green lending, similar to many commercial banks' business models.⁸⁴ To facilitate this, new projects could be designed to be easily distributed to third parties.85

POLICY 18. Guarantees and credit enhancement

Guarantees and credit enhancement are a key tool to maximise DFI balance sheets and mobilise private finance. Tools include De-risking facilities paired with other blended finance instruments can further increase financing flows. Alongside private liquidity provision and development banks' risk transfer, government can provide free market risk hedging (i.e., interest rate risk, foreign exchange risk). These are crucial for large-scale transition financing, especially in emerging markets with limited access to longterm capital, providing long-term financing and protection from negative market fluctuations. Underwriting specific risks such as project completion or political instability can ease high risk premiums for EM investment.86

first loss guarantees, subordinated debt lending, or non-honouring of financial obligation guarantees. Guarantees provide investors with greater certainty of returns, thereby enabling private investment into projects that would otherwise be viewed as too risky.

POLICY 20. **Green finance** facilities



establishing templates and frameworks for green blended finance deals, blended finance provision can be accelerated.

Many DFIs provide specific green guarantee facilities. A green guarantee facility can scale up de-risking provision, streamlining decisionmaking compared to project-by-project allocation. For example, Asian Development Bank's Pacific Renewable Energy Programme provides partial risk guarantees and letters of credit facility to enable private sector investment in Pacific Island renewable power projects.⁸⁷ The Green Guarantee Company's guarantee criteria are aligned with Climate Bonds Standards.⁸⁸ Using science-based criteria can streamline transaction selection and ensure project credibility.

Development finance can be invested in green aggregation facilities (warehouses/conduit entities) that can package assets and provide standards around contracts and loans accepted for packaging. Such aggregation facilities can drive the standardisation of contracts and credibility of green loans by setting out minimum requirements for green securitisation.



Trade policy

Green trade policies can be implemented by departments or ministries of trade and coordinated with domestic fiscal policy. They are needed to meet rising demand



for green technologies and energy, prevent the export of carbon-intensive industries to less regulated markets, and embed just transition principles in these new green trade flows.

POLICY 21. Carbon border adjustment mechanisms



Carbon pricing has not been implemented globally, and the price of carbon varies significantly between jurisdictions, see

Figure 8. To prevent carbon leakage – the relocation of carbon-intensive activities to avoid carbon pricing, governments can introduce carbon border adjustment mechanisms (CBAMs), also known as carbon equalisation measures.

A CBAM applies local carbon pricing to imports of carbon-intensive goods, accounting for any pricing applied in the country of production. This allows full implementation of local carbon pricing, without impacting competitiveness. It also

incentivises global action; export countries to implement their own carbon pricing schemes to capture the revenue, and exporters to reduce carbon emissions. Turkey's climate envoy stated that the EU CBAM proposal encouraged the country to ratify the Paris climate accord.⁸⁹

The EU CBAM is intended to substitute the free allowances of the ETS and prevent relocation of high emitters.⁹⁰ EU importers should be subject

to payments from 2026, with free allowances phased out by 2035.⁹¹ To maximise impact, the scope should be widened to cover more sectors and include indirect emissions. Faster phase out of free allowances would accelerate industrial decarbonisation.

Criticism of CBAMs includes allegations that they are discriminatory against emerging economies.⁹² To address this and better ensure that CBAMs result in global real economy change, revenue can be allocated to Just Transition spending.⁹³

To ensure CBAMs do not result in trade wars, they should take explicit and implicit local carbon pricing into account when setting the border tax. An international framework for carbon border taxes would also assist with this.⁹⁴

POLICY 22. Green trade window

Green technologies should be prioritised for tariff reductions, and not included in trade sanctions whenever possible. Import tariffs on competing products could protect nascent green technologies.⁹⁵ However, protectionist tariffs would hinder the global transition, and likely increase costs for all – see for example the 2012 solar technology duty increases between America and China.⁹⁶ They could result in 25% higher prices for solar modules in 2030.

Ministries of trade could establish a green trade window, providing preferential treatment for the international flow of green goods, services and capital and stimulating green capital and trade flows. This could compensate for any CBAM-induced trade curtailments. Reducing tariffs on environmentally friendly goods and services would also help incentivise decarbonisation and improve the competitiveness of goods such as green steel.

The Asia- Pacific Economic Cooperation forum has reduced tariffs on green products. World Trade Organisation members are engaged in negotiations to establish an Environmental Goods Agreement (EGA) to eliminate tariffs on important environmental goods such as in renewable energy generation, improve energy and resource efficiency; reduce pollution; manage waste and monitor environmental quality.⁹⁷

Green hydrogen holds great potential for renewable energy trade. The global hydrogen market could reach USD2.5tn by 2050.⁹⁸ Many DM transition strategies include significant hydrogen imports to enable decarbonisation of their hardto-abate sectors. For example, the EU Hydrogen Strategy sees 40 GW of its 82 GW of planned electrolysers planned in the EU Neighbourhood. 40 GW of electrolysers would require 77 GW RE capacity compared to a total 2021 capacity in Ukraine and North Africa of 22 GW.⁹⁹

This poses a risk that exports cannibalise much of these countries' RE expansion. Green hydrogen production for export would likely provide companies with the highest economic returns on their electricity. This would substantially slow the transition of the local electricity grid away from fossil-based generation. Trade agreements for hydrogen will need to tackle the political and technical challenges for EM posed by increasing RE to meet domestic demand and export hydrogen. Trade agreements can include strict criteria, including lifecycle emissions intensity and additionality of RE supply. They can also specify allocation of RE, water and



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other resources between local consumption and exports to ensure contribution to local transition and prevent conflicts of interest. $^{100}\,$

Embedding climate and environmental standards in trade policies will help create an even playing field between domestic production and imports and discourage ecologically damaging production in export countries.

POLICY 23. Green export finance

Official finance (export finance and development finance) is key to addressing market gaps by financing less commercially attractive investments such as long-term infrastructure.

Export credit agencies facilitate domestic companies' access to international markets by providing loans, guarantees and other instruments to reduce the risk of exporting goods and services. A government can exclude fossil fuel activities from trade finance instruments and end overseas export credit fossil fuel funding. Many export credit agencies abide by the voluntary rules of the OECD Arrangement on Officially Supported Export Credits.¹⁰¹ This prohibits support for unabated coal-fired power plants. Extending these restrictions to oil and gas export finance is key to ensuring alignment with the Paris Agreement.¹⁰²The rules could also be adjusted to enable more favourable conditions for 1.5°C-aligned lending and investments. UK Export Finance's Transition Export Development Guarantee was introduced to enable the end of international support for fossil fuels. The loan interest rate is linked to the company's transition plan, similarly to that of a sustainability-linked loan.103

By prioritising green projects for these trade finance instruments or setting preferential terms for green projects, DM export credit agencies can support overseas energy transitions, see Figure

9. These efforts can also complement overseas development aid. Some countries, e.g, China's Belt and Road Initiative, already combine development and export finance. Development aid could be used to fund pilot renewable energy projects and critical infrastructure, to prove the case to investors. The export credit agency could then provide a guarantee to further de-risk the investment and leverage private investment. This also frees up development aid for adaptation and higher-risk investments.

Infrastructure policy

The need to build new or replace ageing infrastructure offers an opportunity for deep decarbonisation – approximately 70% of global GHG emissions are Infrastructure investments need to be innovative, low-carbon, energy-efficient, and resilient. Sustainable infrastructure could match

from infrastructure construction and operations.¹⁰⁴

institutional investors' appetite for long-term, stable green investments. Private investment could meet around half of the USD3tn global infrastructure financing gap, and, but high upfront capital requirements present a barrier to this.¹⁰⁵ Infrastructure investment currently accounts for a very small portion of institutional investors' asset allocation.

POLICY 24. Climate risk integration in infrastructure management



To ensure resilience to climate-related hazards, governments will need to address climate risk in infrastructure development and management, and in national disaster risk planning and insurance. For example, Indonesia has put in place a State Asset Insurance Policy program to insure public assets against climate and disaster risks as part of its National Disaster Risk Financing and Insurance strategy. This will cover highly exposed buildings, bridges, transportation, and other government properties located in disaster-prone areas with a significant contribution to public services.¹⁰⁶

Immediately ensuring infrastructure resilience and including mitigation strategies in planning is particularly crucial given the long lifetimes of public assets. This means governments likely have just one investment cycle to ensure resilience or avoid carbon lock-in. To ensure climate risks are addressed and managed, the ministry can include climate risks and outcomes in project appraisal and selection. Ensuring all infrastructure plans assess climate-related risk, regardless of whether they are intended to be a green investment, will help better align public investment with climate goals and ensure climate resilience. The UK Department of Business, Energy and Industrial Strategy provides guidance on assessing energy use and GHG emissions of proposals in construction and operation.107 Similarly, PPP evaluation should also include climate assessments.

POLICY 25. Priority infrastructure strategy



A net-zero energy system will have

very different infrastructure needs from current energy systems. Variable renewable energy supply will increase energy storage requirements, while greater electrification will increase demands on the electricity grid. New patterns of energy imports will also emerge, including cross-border electricity lines and hydrogen and synthetic fuel trade. In addition, energy infrastructure will need resilience as increasing climate extremes increase likelihood of grid failures.

A clear framework and delivery plan for net zero infrastructure will generate investor confidence for renewable energy investments and provide the confidence in energy security required for fossil fuel phaseout plans.

The public sector can direct investment and prevent possible bottlenecks by prioritising certain infrastructure projects for investment.



Figure 9: Export Credit Finance for international energy transitions

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The EU's Projects of Common Interest (PCIs) receive accelerated permitting and are also eligible for financial assistance under the Connecting Europe Facility budget for Energy. PCI allocation is prioritised by those projects that have the greatest net zero contribution.¹⁰⁸ This is a particularly relevant example to countries with privatised energy infrastructure provision, allowing energy ministries to steer private investment to meet specific needs.

A key infrastructure that may be on such priority lists is grid interconnectors and sectoral connectors. Ensuring grid interoperability is crucial to enabling increased RE penetration and helping guarantee investor returns as it allows the cross-border trade of energy. Power-to-X (PtX) technologies convert renewable electricity into synthetic fuels (green hydrogen, e-methanol, green ammonia). These can not only decarbonise energy-intensive industries such as aviation but also provide grid balancing. Green hydrogen, stored in underground caverns or old fossil gas fields (geological storage) could provide long-term grid balancing for VRE. Batteries may be more competitive for short-term balancing, however public support for both will not only scale nascent technologies, but also address investor concerns over variable renewable energy supply.

POLICY 26. Hydrogen clusters

To decarbonise energy uses which cannot be electrified, and to provide energy storage, net-zero energy mixes will include hydrogen at a far greater magnitude than it is today.

Total global hydrogen use is expected to grow 5-7 times, to account for 15-20% of energy demand and global hydrogen investment 2020-50 could total USD15tn.¹⁰⁹ To kickstart a hydrogen economy, governments can establish hydrogen clusters: areas where hydrogen production and consumption are developed together, ensuring demand and supply scale together.

Co-locating supply and demand overcomes the specific challenges of the hydrogen value chain. Simultaneous development of production, storage, transport, and use provides demand and transport certainty, derisking investment. Clusters can be established with simplified planning permissions, overcoming authorisation issues, and supported by subsidies such as on electricity tariffs. Infrastructure clusters can enable the codevelopment of other green technologies such as carbon capture and storage (CCS) and lowcarbon cement production.

POLICY 27. Green PPP framework

Governments can establish a



framework for public-private partnerships (PPPs) to leverage private finance for infrastructure projects. PPPs are

Figure 10: Annual RE investment needs in various climate mitigation scenarios, compared to current investment levels



Source: REN21, 2022. Renewables 2022: Global Status Report, https://www.ren21.net/reports/global-status-report/

a valuable tool for developing sustainable and resilient critical transition infrastructure, providing financial value for the taxpayers and diversifying risk allocation. Climate change impacts can be integrated into contractual KPIs and project design.¹¹⁰ Involving the private sector can also allow knowledge sharing and increase transparency and accountability among stakeholders.¹¹¹ A PPP legal framework is needed to establish good investment planning processes that prioritize projects based on development needs and contribution to the green transition. The framework can also limit fiscal risks from high levels of PPP liabilities, for example, Uruguay's PPP law caps total liabilities to 7% of GDP.¹¹² To ensure a successful PPP framework, a dedicated agency in the form of a PPP unit or secretariat can be established for an efficient rollout of a PPP programme.

PPPs are often highly bespoke and slow to develop, focusing on single asset creation. Scaling green PPPs can create a pipeline of bankable infrastructure projects that can help deliver regional infrastructure needs. By developing a robust PPP model for a single deal and then replicating it, this approach spreads costs, enhances impact, and encourages programmatic, competitive tendering. This creates new markets and enables faster delivery and lower prices. For example, the IFC's Nubian Suns project financed 13 solar PV projects in Egypt, assembling 18 developers and 11 FIs by taking a programmatic approach to financing. Multiple transactions were consolidated into a streamlined standardised process, resulting in significant cost efficiencies, see also policy 20.113

Energy policy

1.5°C-aligned energy systems will require a significant increase in RE investment, see Figure 10.



Currently, investment flows are dominated by fossil fuels, see Figure 11. Capital reallocation to RE is crucial to success of transition and will protect investors from stranded asset risks. Overall additional energy investment will be around 5%/year.¹¹⁴

Coherent and stable long-term energy policy is one of the most important ways for the ministry to increase investment in RE. Targets for RE penetration, both near- and long-term, will help provide investor certainty. However, further enabling policies are required to enable these targets to be met to ensure fossil fuel investments are rapidly wound down. While targets have spread to many markets, other implementing policies have not seen the same growth.

As outlined above, phasing out fossil fuel subsidies and implementing carbon pricing are crucial to improving the competitiveness of RE with fossilbased energy production. A RE-based energy system will be markedly different from a fossilbased one, strategic energy policy will facilitate a smooth transition, ensuring adequate energy supply, transmission, distribution, and storage.

The energy transition investment gap is also widening. Policymakers will need to focus on enabling capital flows to developing countries, which currently attract 12x less investment per MtCO₂e.¹¹⁵



Figure 11: Global energy supply investment by sector

Energy use is also not just electricity – electricity accounts for 17% of global energy use. While electricity production is still dominated by fossil fuels, transport and heating and cooling are even more so, see Figure 12, and will require targeted policy to accelerate decarbonisation.

POLICY 28. Renewable energy auction requirements



Renewable energy auctions enable policymakers to procure RE at competitive prices and provide investors

with revenue certainty. While they are one of the most effective policies to boost renewables investment in EM, they are present in only 50% of the markets.¹¹⁶ Auction requirements can be adjusted to maximise the investment's impact and fully address climate risks. Lifecycle emissions requirements can limit the emissions impact of construction and circular economy requirements can reduce demand for materials and ensure the use of recycled materials.

Requiring the use of local workforce and local supply chains could enable local support for development, and can ensure a multiplier effect of the investment, kickstarting a local green infrastructure economy. For example, Turkish large-scale renewable energy auctions require the construction of local production facilities.¹¹⁷ Local circumstances will need careful evaluation to ensure such requirements do not hinder RE production.

Including a maximum size constraint for some auctions will enable small-scale and distributed production participation which would otherwise be outcompeted by larger companies.¹¹⁸ This produces a portfolio effect, reducing the risk of projects not coming online.¹¹⁹ This can also enable growth of more distributed RE systems which will reduce grid congestion and imbalance and minimise land use impacts and generate community support, as smaller-scale installations will have less impact on land-use.

POLICY 29. Fossil fuel plant decommissioning

The long lifetimes of fossil fuel infrastructure mean many plants will need early decommissioning if we are to meet 2030 and 2050 climate targets.¹²⁰ In addition, many existing fossil fuel reserves will need to

Figure 12: Renewable Energy in Total Final Energy Consumption, by Final Energy Use, 2019



REN21, 2022. Renewables 2022: Global Status Report, https://www.ren21.net/reports/global-status-report/

Source: International Energy Agency, 2022. World Energy Investment 2022

be left in the ground.¹²¹ According to the IEA, achieving 1.5°C requires advanced economies to phase out unabated coal generation by 2030 and the rest of the world by 2040.¹²² Over the last ten years, the fossil fuel share of the global energy mix has remained consistent. This is despite it being cheaper in over half of the world to build new wind or solar than to continue operating existing coal plants.¹²³ For RE ramp up to materially reduce emissions, fossil fuels must be rapidly phased out. Phaseout will also improve RE investibility as it will reduce market saturation. While financing the phaseout of fossil fuel assets is expensive, there are likely greater costs associated with a sudden disorderly transition away from fossil fuels or asset stranding once decarbonisation deadlines materialise.

Fossil fuel assets can be repurposed for a netzero economy. Fossil-fired power plants' grid connections can be utilised for RE installations or hydrogen electrolysers. Bangladesh's Mujib Climate Prosperity Plan aims to convert existing coal and fossil gas plants to become energy hubs, converted to either green hydrogen, waste-to-energy, or biomass plants. In 2021, Bangladesh rejected proposals to build 10 new coal-fired power plants.¹²⁴

By transitioning fossil fuel workforces, governments can facilitate economic development and minimise resistance to transition. For example, Scotland provided GBP12m for an Oil and Gas Transition Training Fund, re-skilling workers for careers in wind power. The US Inflation Reduction Act provides additional incentives for clean energy projects located in energy communities, including coal communities.¹²⁵

US coal phaseout is supported by securitisation mechanisms in Wisconsin, Michigan, and New Mexico. This refinances the existing customer obligation to pay the utility's return on equity and debt with a low-interest bond. The utilities can then invest in RE with the cost savings invested into just transition programmes.¹²⁶

POLICY 30. Energy transition mechanisms

Energy transition mechanisms are financial mechanisms to support an orderly and accelerated fossil fuel

phaseout; winding down fossil fuel assets and their obligations, supporting the just transition, and enabling the buildout of renewable energy assets and infrastructure.

Asian Development Bank's pilot Energy Transition Mechanism uses public and private financing to buy and retire or repurpose coal plants in Indonesia, the Philippines and Viet Nam.¹²⁷ Climate Investment Funds' Accelerating Coal Transition investment programme combines concessional financing with technical assistance to de-risk and pilot investments to phase out coal, repurposing or decommissioning coal assets, and creating social protection programs. This will enable a just transition from coal power in EM starting with South Africa, India, Indonesia, and the Philippines.¹²⁸ South Africa's USD8.5bn Just Energy Transition Partnership Investment Plan is funded by the UK, EU, US, France, and Germany. However, only 3% of the funds will be delivered as grants, raising concerns over the impact on the country's debt burden, and whether this offers better terms than raising money on international markets.129

Such mechanisms can also be expanded for the phaseout of other fossil fuel plants and assets – gas-fired power, and distribution infrastructure.

These mechanisms will need careful regulation, to ensure phased-out plants are not replaced by new fossil fuel assets. One way to ensure impact is to require entity-level transition plans from the utilities, aligned with the Climate Bonds Credible Transition Principles, see Figure 14.¹³⁰ Plant age eligibility restrictions can also ensure funding is not absorbed by plants already near the end of economic life.¹³¹

To prevent unwanted fossil fuels being taken up by non-power sectors, it is important to include all sectors in phaseout commitments and energy transition mechanisms.¹³²

Fossil fuel phaseout is hindered by the Energy Charter Treaty which allows foreign investors in the energy sector to sue their host States when policy measures and other State action affect their interests.¹³³ In 2021, German energy company RWE used the Treaty to file a EUR1.4bn compensation claim with the Netherlands over its coal phase-out plan. There is also a sunset clause to the Treaty so existing fossil fuel investments would still be protected for 20 years following a country's withdrawal. The Treaty is currently undergoing a modernisation process, signatories could propose amendments such as excluding new fossil fuel investments from the protection clause. The 53 signatories will need to consider whether withdrawal or amendment of the Treaty will give them the greatest security in their fossil fuel phaseout plans.

POLICY 31. Targeted feed-in-tariffs

For innovative and early-stage technologies, feed-in-tariffs (FiTs) can enable economic viability by reducing investment risk and ensuring stable returns.¹³⁴ FiTs overcome the price differential between green and high-carbon production and were instrumental to wind and solar scaling – the German FiT is credited with enabling the global solar PV learning curve. However, they are a high-cost policy and are increasingly replaced by instruments which also enable competitive pricing – such as contracts for difference or auctioning.¹³⁵

Germany's FiT was introduced in 2000 and increased the RE share in the electricity mix, from 6% to 35% in 2020. This model has been replicated in 80 other countries. The fixed price and guaranteed returns encouraged smallscale RE development and led to a boom in energy cooperatives. This model enabled a more decentralised and democratic transition than an auction-based system and generated citizen support for the transition despite high costs. The updated national renewable energy law established a new FiT for rooftop solar installations to encourage increased installations to feed directly into the grid consumption.¹³⁶ This demonstrates how FiTs can be targeted to nascent technologies and smallscale renewables.¹³⁷

In comparison, Spain's 2007-8 FiT paid solar power producers a very high rate in comparison to electricity prices and did not include a step-down mechanism to reduce the subsidy in line with falling technology costs. The FiT was also not funded by consumers, and instead effectively deficit funded. When the government suddenly cut FiTs for new wind and solar, and cut the tariff paid to existing producers, this created a boom-and-bust cycle, particularly harming the solar PV industry. 2708 MW of solar PV were installed in 2008 and 0 MW in 2009. This also hugely damaged investor confidence in RE policy, a critical factor for national RE scaling. FiTs therefore require cost containment measures, to ensure the subsidy stays within budgetary means, avoidance of retroactive policy changes and independent regulation to ensure appropriate levels of support.138

POLICY 32. Carbon contracts for difference

Carbon contracts for difference (CCfDs) provide low-carbon producers with revenue certainty, by guaranteeing a fixed carbon price, the strike price. The difference between the strike price and actual price will be paid by the government to the producer if strike price is lower than actual, and vice versa if it is higher. This long-term price hedging derisks the investment. They can be applied to electricity generators and low-carbon industry such as steel.¹³⁹ Unlike feed-in tariffs, CCfDs are auctioned to ensure competitive pricing.

The UK contract for difference (CfD) scheme for low-carbon electricity generation establishes a 15-year period of payments based on the difference between the production cost of lowcarbon energy and average energy prices. This provides direct protection to developers from volatile wholesale prices, a critical issue when considering projects with high upfront costs and long lifetimes. Additionally, they protect consumers from paying a premium to suppliers when electricity prices are high. The competitive nature of the programme means the strike price decreases over time, reflecting and incentivising decreasing technology costs. The scheme is funded by a levy on electricity suppliers (the Supplier Obligation), and so provides an additional transition incentive.140

If technology agnostic, CCfDs' contribution to scaling innovative technologies may be limited as auctions may be dominated by mature technologies. For this reason, Germany is already planning pilot CCfDs to promote green hydrogen in the hard-to-abate sectors of steel and chemicals.¹⁴¹

Long-term tax credits could provide income security for RE developers, matching the longevity of RE projects. For example, the US Inflation Reduction Act reinstates and expands existing production and investment tax credits for wind, solar and energy storage with a 10-year time horizon. Previous US tax credits were shortterm and inconsistent, resulting in high levels of uncertainty. This new tax credit scheme should overcome such issues.¹⁴²

Another low-cost policy is the introduction of quotas or renewable energy portfolio

standards. This will encourage RE investment from large incumbents however this might incentivise incremental over transformational change which can increase the cost of transition. The EU has recently reduced its biofuels quotas and set limits on how much first-generation biofuels with high indirect land use change (ILUC) risk) can count towards renewables targets.¹⁴³ First-generation biofuels are produced from agricultural feedstocks, whereas second generation is from waste. Unless carefully regulated, biofuel production can lead to indirect land use change (ILUC); expansion of agricultural land, impacting biodiversity and carbon sinks. It can also threaten food security by increasing demand for grain, and possibly offering higher returns.

Quotas could encourage gas blending; mixing a certain proportion of low-carbon hydrogen, or other low-carbon gas, into the fossil gas supply. This requires infrastructure retrofit at hydrogen volumes over 10%, while the lower energy density of hydrogen means a 5% blend by volume would only displace 1.6% of fossil gas supply.¹⁴⁴ Combustion of hydrogen for domestic heating or electricity generation results in energy losses of around 30% during the conversion process from electricity to hydrogen.¹⁴⁵ Hydrogen is better reserved for uses where direct electrification is not possible, such as industrial, high-temperature, processes.¹⁴⁶ Quotas could result in the cost of implementation being passed on to consumers, hindering just transition efforts.

POLICY 33. Streamlined renewable energy permits



Easing permitting processes for renewable energy installations is a low-cost and quick-to-implement policy to accelerate renewable energy investment.

For example, EU emergency regulation eased RE permitting to accelerate the REPowerEU Plan to transition away from reliance on Russian fossil gas imports.¹⁴⁷

POLICY 34. Distributed renewable energy standards

For many emerging economies, the energy transition will consist of decarbonising local energy production and addressing energy poverty (defined as the lack of access to sustainable modern energy services and products or spending, or as the need to spend 10% of

income on fuel¹⁴⁸). This requires investment in distributed renewable energy (DRE). Financial aggregation can enable private investment in these projects, providing capital for DRE and enabling investor portfolio diversification. Establishing an asset-backed securities (ABS) market in EM will help with this.¹⁴⁹ Standardisation of DRE and mini-grid investments will also increase scalability and facilitate aggregation.

Aggregation may need to be combined with other de-risking mechanisms such as concessional financing, guarantees and

subsidies. DFIs will be crucial in enabling the development of such a programme. UNDP has set out a Derisking Renewable Energy Investment framework – a set of policy instruments for the public sector to reduce, transfer or compensate for investment risks.¹⁵⁰

DRE can also enable decarbonisation in countries with high grid penetration, providing flexibility to meet increasing electrification. Net metering (whereby consumers can sell RE back into the grid) is a key policy to drive deployment of small-scale solar but is available in less than half of markets.¹⁵¹ Digitalisation will help integrate DRE into the grid, enabling grid operators to monitor and influence their operation, reducing congestion. Flexible electricity tariff design can encourage DRE owners to operate these resources in consideration of grid requirements.¹⁵²

Buildings and urban policy

Cities have the potential to enable high levels of energy efficiency, and lower carbon intensity of many activities, through the agglomeration and concentration

of populations and economic activity. However, urban development can be sprawling, resourceand carbon-intensive and highly vulnerable to climate hazards. 70% of GHG emissions are associated with urban areas. Robust sustainable urban planning can ensure green urban growth and attract sustainable investment to fund development and tackle social inequalities.¹⁵³

In buildings policy, there is the opportunity to both meet the transition and alleviate energy poverty, by investing in building energy efficiency and RE heating and cooling solutions. Policy responsibility will sit with a dedicated department or with departments of infrastructure and energy.

POLICY 35. Climate-sensitive urban development strategies

To ensure compatibility of urban development with 1.5°C, climate risks and opportunities need to be fully assessed in all development plans. This includes both assessment of physical risks under 1.5°C of warming, and assessment of transition risk in a net zero economy.

Integrating climate considerations in urban development strategies will ensure resilient and resource-efficient urbanisation. The speed of urbanisation makes this a priority to ensure development of resilient and wellfunctioning cities.

Governments can reallocate funding away from high-carbon and sprawling urban development towards sustainable urban infrastructure. This can quickly reorient urban investment towards a low-carbon and climate resilient model.

POLICY 36. Renewable energy requirements



Heating and cooling account for 51% of energy use, but only 11.2% is met by RE.¹⁵⁴ Fossil fuel phaseout schemes send a clear market signal. Denmark banned the installation of fossil gas or oil boilers in 2013, while in the Netherlands, new buildings have been banned from accessing the gas grid since 2018.¹⁵⁵ These will need to be phased in for existing buildings, accompanied by financial support such as boiler scrappage schemes.

New buildings provide an opportunity for high ambition. Governments can set Energy Performance Certificate (EPC) and renewable energy use requirements for new buildings. The recast of the EU Energy Performance of Buildings Directive (EPBD) requires new residential buildings to be net-zero from 2030 and new public buildings by 2028.¹⁵⁶ All new buildings and major renovations will be required to install solar generation.¹⁵⁷ This can be strengthened by immediately prohibiting the supply of fossil fuels to new buildings.

POLICY 37. Green mortgage schemes

Lenders can be encouraged to provide green mortgage through preferential treatment given their lower risk, see policy 88.¹⁵⁸ Green

given then tower risk, see policy as. A Green mortgage schemes offer more favourable lending conditions against houses with a certain level of energy efficiency or for green energy interventions. Regulations requiring lenders to disclose the energy efficiency of their mortgage books could also incentivize them to offer green mortgages to improve this metric. The small size of green building investments is mismatched with the investment appetite of sustainable institutional investment flows. Aggregating and scaling these small investments, into green mortgage-backed securities and other products will enable institutional investor participation.

POLICY 38. Land value capture

Land value capture can be used to fund the expansion of urban infrastructure by monetising the increase in land value in the catchment area of new transport

infrastructure. It involves selling land or retail space above public transport infrastructure (bus depots, train stations etc). This model can enable investment by authorities that lack the sufficient tax base to fund significant CAPEX or ensure more predictable income from the investment than passenger fares. Land value capture has been successfully implemented in DM and EM cities. While many metro systems operate at a loss, Hong Kong's Mass Transit Railway (MTR) is self-sustaining. Under the 'rail plus property' model, MRT is granted land development rights at stations and depots on a new rail line. It partners with developers to build properties and receives a share of the profits. MTR also pays the government a land premium. This model reduces investment risks for the government, keeps transport affordable, and enables condensed urban planning.¹⁵⁹

POLICY 39. Incentive schemes



incentives for energy efficiency interventions through tax relief schemes or providing discounted loans for energy efficiency measures. For example, Italy's 2019

Ecobonus and 2021 Superbonus tax relief scheme triggered a 500% increase in home renovations in 2020-2021.¹⁶⁰ However, it is available for any energy efficiency measure, regardless of efficiency gains made, whereas the EU Taxonomy requires building retrofits to make a significant contribution to energy savings to qualify as green.

Costs of energy efficiency measures or RE installation can also be reduced if they are implemented neighbourhood wide. This also reduces the administrative burden on property owners and increases uptake. Making incentive schemes available to group applications or councils can enable this.

To leverage private capital for retrofitting and simplify retrofit adoption, property assessed clean energy (PACE) programmes can be established. The PACE provider issues ABS to fund retrofitting, with loan repayments attached to the property tax bill. The US PACE programme funds both commercial and residential retrofitting, removing upfront financing costs.¹⁶¹

Governments can also encourage district heating, which can be more energy efficient than

individual home heating. Germany is planning a subsidy scheme for efficient heating grids to incentivise the switch to district heating, support the switch to renewable energy carriers and improve the use of waste heat.¹⁶² Such schemes can also be linked to community DRE development, see policy 34.

POLICY 41. Energy standards

Buildings account for a large proportion of labelled and unlabelled capital markets, accounting for

29% of green bonds, USD146.9bn, issued in 2021.¹⁶⁵ Policy can facilitate debt financing of green buildings through securitisation frameworks, see policy 100, and standards development – for both energy efficiency interventions and new buildings. This can also ensure adequate ambition from investments in green buildings and infrastructure. Governments can require a certain reduction in energy use or set a threshold for energy efficiency measures to qualify for support programmes or green mortgages. Accompanying standards with clear energy efficiency labelling can ensure visibility of green investments and ease decision-making.

Complex contracting for energy efficiency projects can create mistrust among end users and discourage bank lending for these projects. Clear and standardised energy performance contracts can streamline the investment process and encourage bank lending and create opportunities for scaling.

POLICY 42. Green planning permission fast tracks

Transparent and consistent bidding processes for projects will encourage investment while easing planning permission

POLICY 40. Green municipal bond issuance

While private investment can be to fund key sustainable urban infrastructure, many projects may remain unappealing as private investors cannot capture projects' positive externalities. Public funding remains a crucial factor for sustainable urban development. Increasingly, responsibility for raising capital for infrastructure is shifting

raising capital for infrastructure is shifting to municipality rather than state or national government, which may not have the ability to raise taxes or access debt capital markets. Central government or development banks can enable municipal green bond issuance through efforts to improve municipality creditworthiness and reduce investment risk, such as risk by centralising and ring-fencing revenue collection and establishing financing mechanisms to cover revenue shortfalls from user fees.¹⁶³ This can improve the credibility of subsidy and payment schemes and generate investor confidence.

Smaller cities will have more problems accessing capital markets, instead they can apply for loans from national development banks or specific municipal development funds. For example, Colombia's Financiera de Desarrollo Territorial (FINDETER) facilitates commercial banks to finance municipal governments by lowering the costs of loans. Its AAA local credit rating enables it to access less expensive financing. FINDETER and IDB's Platform for Sustainable and Competitive Cities provides urban sustainability projects financial and technical assistance.¹⁶⁴ for zero-carbon buildings or energy efficiency measures provides further incentives. Such policies are low cost and easily enacted.

Industrial policy

Industry receives less attention in decarbonisation policy than other sectors.¹⁶⁶ However, the decarbonisation of hard-to-abate industries will need significant



policy support. These will not see market forces of growing RE competitiveness, given the high cost of their decarbonisation technologies, and their decarbonisation pathways are not clear. Policymakers will need to both set out these pathways and encourage and enable investment in their transition.¹⁶⁷ Industrial policy is also closely aligned with infrastructure and energy policy.

POLICY 43. Sectoral emissions targets



Net-zero targets must be accompanied by ambitious short-term emissions reduction targets. Alongside clear roadmaps, these can also prevent incremental change and efficiency gains which could create asset stranding risks and increase the cost of transition. For example, incremental fuel switching through gas blending (blending hydrogen into fossil gas supply) results in limited emissions reductions and requires retrofitting of gas infrastructure once hydrogen reaches 10% of supply, increasing transition cost.¹⁶⁸

These targets can also ensure transition occurs in coming investment cycles. Given the long lifespans of such assets, this will avoid carbon lock-in. For example, 71% of existing coal-based blast furnaces (1090 Mt) will reach the end of its lifetime and require major reinvestment before 2030.¹⁶⁹

POLICY 44. Targeted research and development

Governments will play a crucial role in enabling nascent decarbonisation technologies to scale and reach economic viability. Government R&D programmes can target particular technical challenges.

Cooperation and collaboration are crucial to their success. Collaboration with industry allows identification of R&D priorities, strengthening knowledge flows, while international cooperation will also enhance innovation. Clarity on research priorities and funding availability will also help incentivise key research. The EIB's InnovFin Energy Demo Projects initiative provides loans, loan guarantees or equity-type financing of EUR7.5-75m to innovative demonstration projects in energy transformation.¹⁷⁰ This can help boost private investment in innovation.

POLICY 45. Sectoral subsidies and guarantees

Guarantees can de-risk larger scale projects, addressing the investment risk of first movers and encouraging private

sector investment. Guarantees can mobilise massive investments and provide convening support to platforms orchestrating value-chain collaborations and de-risk demonstration funding. For example, the InvestEU Fund aims to mobilise over EUR372bn of public and private investment through an EU budget guarantee of EUR26.2bn, 30% of which must support climate investments.¹⁷¹ Guarantees can be fiscally efficient as they mobilise additional investment, have a greater impact than direct investment and result in lower balance sheet liability than direct subsidies. Green state-backed lending encourages and derisks bank lending to green projects.

Subsidies also mobilise private investment.

In Malaysia, the Green Technology Financing Scheme provides an interest subsidy of up to 2% for financing of green projects and a 60% government guarantee.¹⁷² Establishing clear phase-out dates for subsidies also ensures that schemes do not stifle competitiveness and innovation – private investment has been proven to step in once subsidies are phased out.¹⁷³

Green guarantees and subsidies will need alignment with standards or taxonomy to ensure they are supporting robust sustainable investments.

Carbon contracts for difference (policy 32) can be used to provide price certainty but they will need to avoid incentivising incremental change and ensure projects are on a Paris-aligned pathway. Favouring technologies that allow for deep emission reduction will avoid carbon lock-in.¹⁷⁴ Germany is planning CCfDs for the decarbonisation of the hard-to-abate sectors.¹⁷⁵

POLICY 46. Green PE and VC support

Many early-stage technologies are not well-suited to loan and bond financing due to their high risk. Instead, they can be funded by private equity (PE) and venture capital (VC) investments. The government can encourage green PE and VC by incorporating climate impact in their PE and VC support programmes, providing more favourable guarantees and equity on green projects.

POLICY 47. Green public procurement

As public procurement represents a large proportion of demand for products such as steel (25%) and cement (40%), green public procurement (GPP) offers an opportunity to boost demand for green steel, cement etc.¹⁷⁶

POLICY 48. Carbon capture and storage strategy

Carbon capture and storage will be needed for the decarbonisation of some hard-to-abate activities, such as to tackle process-based emissions in cement production. The IEA NZE scenario envisages 7600 Mt CO₂ capture by 2050, compared to 40 Mt CO₂ in 2020.¹⁷⁸ Policymaking can ensure the strategic application of CCS and establish robust standards for infrastructure. This is vital to prevent overreliance as CCS cannot remove all emissions and has a limited impact on supply chain emissions, which account for a significant proportion of carbon emissions from fossil fuel energy.

CCS standards are key to ensuring a sufficient level of emissions capture, ensuring longevity of storage, preventing CO₂ leakage at all

For example, the EU has published voluntary GPP criteria so as to facilitate the inclusion of green requirements in public tenders.¹⁷⁷ Such voluntary criteria could be gradually replaced with mandatory criteria, embedding preferential spending across ministerial budgets, by incorporating carbon emissions and circular economy considerations into spending assessments or by allocating a certain portion of budgets to low-carbon solutions. These criteria can also be aligned with Taxonomy criteria, ensuring consistency of sustainable investments. Given the large purchasing power of governments, such policies can not only send a market signal but also make a significant contribution to sustainability targets.

POLICY 49. Transition standards and roadmaps

To enable industrial transition, governments will need to establish science-based standards and roadmaps for decarbonisation, to ensure transition investments are aligned with necessary carbon trajectories. Following Climate Bonds' Transition Principles can ensure credibility and ambition of transition roadmaps, see Figure 14. Aligning these with international standards will enable trade of green products, and help countries plan cross-border projects, leading to lower costs, faster implementation, and security of supply. The International Sustainability Standards Board's (ISSB) objective is to develop such global standards with a clear focus on sustainability and ESG issues.¹⁸¹

Including full lifecycle considerations will ensure developers mitigate environmental impacts in the supply chain and address scope 1, 2 and 3 emissions. This can help mitigate the level of stages of the process, and ensuring the CCS process uses low-carbon energy. Standards can allow for some uses of the captured carbon, CCUS, only when the CO_2 is used for the manufacture of durable products. CCS has also primarily been used for enhanced oil recovery – long-term geological storage requirements and robust limitations on the use of captured carbon are essential to ensure it does not contribute to increased fossil fuel exploitation.¹⁷⁹

Strategic infrastructure development for transporting CO₂ to storage sites can be included in infrastructure development prioritisation schemes. For example, CO₂ transport infrastructure is eligible for EU PCI status.¹⁸⁰ Supportive policies such as the accelerated permitting of PCIs can favour priority sectors, to ensure CCS is reserved for emissions which cannot be prevented.

resource extraction required for the net-zero transition, a growing concern given projected demands on the metals and mining industry, and the environmental impact of mining activities.

Accelerated production of decarbonisation technologies such as batteries and solar panels mean overall demand for critical raw materials is set to double by 2040.

Lithium demand could grow 40 times, and graphite, copper, and nickel demand 25 times.¹⁸² Sustainable and science-based standards for extraction and processing of these minerals will mitigate the environmental impact of this industry. Governments will also need to fund R&D and facilitate investment in recycling, reuse, and substitution of these minerals to limit demand for mining and help diversify supply chains. Diversifying supply chains will help ensure security of supply, as many minerals are highly concentrated in a few countries – 34 of rare earths are produced in three countries. Without such policies, limited supply could delay the energy transition.



Transport policy

Development of green transport systems provides many varied investment opportunities, in green private transport, decarbonising and expanding public transport, and enabling self-powered mobility. Netzero transport will be delivered by system redesign, not solely technology switching and electrification. Transformative urban planning will reduce travel distances and make sustainable transport more convenient.¹⁸³ This will enable decarbonisation, reduce inconvenience of transition for consumers and reduce the use of cars. This will also have significant co-benefits; reducing air and noise pollution, reducing transport costs for consumers, and improving health and wellbeing. Green transport policies will require close collaboration between central and subnational government.

The transport sector presents challenges given complexities in capturing revenue, and the multiple actors involved. Transport accounts for 32% of energy use globally but only 3.7% of its energy mix is RE.¹⁸⁴ Heavy duty transport, shipping and aviation are emissions-intensive hard-to-abate sectors. The policies outlined in Industrial policy for hard-to-abate industry are also relevant for their decarbonisation. As these industries are even earlier in the transition pathway than other hard-to-abate sectors, without clear decarbonisation pathways, governments should focus on funding R&D and encouraging early-stage investment in innovative technologies.

POLICY 50. Internal combustion engine phaseout strategy



Clear phaseout dates for ICEs are needed to give a clear signal to investors, manufacturers, and consumers of the need

to switch to EVs. The UK set its 2030 phaseout date in 2020 – setting phaseout dates early allows time for transformation of investment flows. New fossil fuel light duty vehicles should be phased out by 2030-2045 globally.¹⁸⁵

Ministries will also need to remove incentives on ICEs, such as tax exemptions on diesel consumption, or lowered fuel duty.¹⁸⁶ Such subsidies distort the market and this spending should be channelled to support customers with EV purchase – an important example of environmental tax reform (policy 7).

Some carbon taxation regimes do not include transport due to carbon leakage concerns. Including all transport in carbon pricing will help ensure their cost and competitivity better reflects their environmental impact. This can encourage technology switching, for example rail transport for overland aviation. In addition, pricing mechanisms on fuel could also factor in fossil fuel externalities, either in addition to carbon pricing or as an alternative in countries where economy-wide carbon pricing is not present/possible. Congestion charging can further discourage use of private cars and ICEs. Ring-fencing proceeds for investment in low-carbon transport infrastructure is also key. This helps ensure such pricing mechanisms lead to behaviour change and uptake of public transport. For example, London's congestion charge proceeds must, by law, be reinvested in London transport.

POLICY 51. Electric vehicle incentives

Decarbonisation technologies for private transport, electric vehicles (EVs), are now competitive with internal combustion engines (ICEs) on a full lifecycle basis. However, governments will still need to support their uptake to overcome consumer reluctance. Tax incentives can bring down the upfront cost of EVs, bringing this closer in line with that of ICEs. Strategic development of the charging network to enable widespread EV use is also crucial.

POLICY 52. Green public transport procurement

Public transport needs to be both scaled up, to reduce private transport reliance, and be decarbonised. Green public procurement can be used to shift public transport investment to green. Procurement programmes can enable local governments to consider the total cost of ownership, levelling the playing field with fossil-based transport options with lower upfront costs. Procurement programmes can also help boost investment in sectors that are under development, as long-term offtake agreements will provide demand certainty and boost investor confidence - hydrogen, green steel. Central government mandates for green transport procurement can ensure sufficient speed and ambition of procurement.

National or supranational governments can provide subsidies to local authorities to invest in green public transport. This can also ensure a just transition by enabling investment in low-income regions with a smaller tax base.

POLICY 53. Sustainable aviation fuel mandates

Specifically in air transport, mandates for sustainable aviation fuel (SAF) can be used. In the UK, a mandate will apply from 2025, with 10% of jet fuel to be SAF by 2030.¹⁸⁷ While mandates can pose difficulties and promote incremental change or inefficiencies and so are not suggested for all hard-to-abate industries, in aviation a mandate with strict criteria to prevent use of unsustainable biofuels and promote use of green hydrogen-based fuels can help generate demand and provide investor confidence. However, the scales of feedstocks required and productive and import capacity must be carefully considered when implementing mandates. For example, to produce green hydrogen to power planes would require over double the UK's current RE generation capacity.¹⁸⁸

Environmental policy

Environmental policies that maintain biodiversity are closely aligned with emissions reduction as climate change and biodiversity loss are intrinsically linked. Nature



provides significant climate change mitigation, acting as a carbon sink. Land and oceans have absorbed more than half of all anthropogenic CO₂ emissions in the last decade.¹⁸⁹ Investing in nature-based solutions (NBS) could achieve up to a third of the short- to medium-term emissions reductions needed to limit warming to 1.5°C.¹⁹⁰

Environmental stewardship is a core contributor to sustainable economic development. More than half of global GDP is estimated to be nature dependent.¹⁹¹ As outlined for climate risk in Figure 2, severe financial losses could result from environmental degradation and biodiversity loss. These could result from reduced crop yields with loss of pollinators or could be a large economy-wide shock from another pandemic, as seen during COVID-19. A major risk arising from biodiversity loss, and climate change, is the emergence of new pandemics, as humans and livestock are brought into closer proximity with wildlife, see policy 69.¹⁹²

Biodiversity and biomass are being lost at an unprecedented rate and immediate action is required. More than a million species are at threat of extinction, including a third of the world's 60,000 species of trees.¹⁹³ The climatebiodiversity nexus means that biodiversity loss undermines climate mitigation, destabilising carbon sinks, and releasing long-stored carbon into the atmosphere. Climate-nature feedback loops accelerate species loss and extreme climate events.¹⁹⁴ For example, climate changeinduced warming damages marine biodiversity, reducing the carbon-absorption capacity of oceans, which threatens spiralling global warming and biodiversity loss.¹⁹⁵ The Inevitable Policy Response's Required Policy Scenario calls for an end to deforestation before 2030 and the UN Convention on Biological Diversity (UN CBD) targets the conservation of 30% of land and sea areas by 2030.196

POLICY 54. Conservation value in mitigation and adaptation plans



By recognising the value of nature to climate mitigation and adaptation goals and to economic development, policymakers will be able to channel investment to nature, help achieve NDC commitments and limit the economic impacts of climate change. Conservation can deliver immediate carbon reductions. and natural climate resilience, e.g., mangroves

provide coastal flood protection, reducing the need for engineered infrastructural solutions. NBS provide many other economic benefits, especially in rural areas where investment will strengthen livelihoods and create new jobs.

By valuing nature, policymakers can be incentivised to fund its protection. For example, Ministries of Finance should recognise that conserving forests has greater overall value in achieving climate targets than the short-term benefits of deforestation. Deforestation not only releases carbon into the atmosphere but also severely impacts local rainfall and temperatures. Systemic impacts from lower rainfall and increased extreme heat days could result in reduced investment flows as agricultural supply chains become unreliable and sovereign bond holders become exposed to energy price inflation, loss of export income and reduced productivity.¹⁹⁷

The majority of NDCs include carbon reduction contributions from improved land management, and ongoing degradation of forests and other ecosystems undermines the contributions of other low-carbon transition initiatives.¹⁹⁸ Visibility of progress that countries are making towards their NDCs is likely to impact countries' credit ratings. A credit rating downgrade would increase the cost of capital and disincentivise investment. This provides a clear incentive to policymakers to recognise the impact of conservation on meeting their NDC and take action to support it.

POLICY 55. Nature-based solution investment strategy

The scope of NBS is very wide and includes the conservation and restoration of forests, mangroves and natural grasslands, regenerative agricultural practices that increase carbon storage in soils, and enhancement and protection of marine ecosystems. Successful NBS projects increase natural carbon capture and storage and enhance biodiversity. Biodiverse ecosystems are more stable and resilient to change, generally storing more carbon as well as providing other ecosystem services, such as soil stability and water supply. Countries with abundant natural capital have a competitive advantage in delivering NBS, but few are taking advantage of the economic opportunities that this presents. By encouraging investment into natural capital, many developing countries could meet their NDCs more easily and attract investment flows from industrialised nations that seek NBS as an interim step towards decarbonisation.

POLICY 56. Nature-related risk and opportunity disclosure

The value of natural ecosystem services is frequently ignored by the market and therefore their economic contribution is overlooked in financial assessments. This issue is being addressed by the Taskforce on Nature-related Financial Disclosures (TNFD), which is producing a framework that provides transparency on nature-related risks and opportunities, see Policy 93.¹⁹⁹ Governments and FIs can also use TNFD disclosures to facilitate decision-making. Open-source data hubs can provide FIs with ecosystem data to facilitate asset-level assessments, like those that are being established for climate data.²⁰⁰ Similarly, including biodiversity activities in green taxonomies will increase awareness of biodiversity investments, and their role in meeting climate goals.²⁰¹

POLICY 57. Payments for ecosystem services

Payments for ecosystem services (PES), including for example watershed services (PWS), provide incentives for environmentfocused management of natural resources. In a PWS system, a downstream service buyer (e.g., local water authority) compensates upstream resource users (e.g., a farmer using nitrate fertilisers) for changing their land use patterns to improve water supply. As an example, New York City adopted an integrated water resource management approach to protect the Catskill/Delaware watershed, incentivising improved land management to maintain clean water supply. This cost about USD1bn, providing significant savings when compared with the cost of installing a water treatment facility, estimated at USD4-6bn.²⁰²

Since introducing a PES scheme in 1996, in response to decades of deforestation, Costa Rica's forest cover has doubled, and per capita income has tripled. The National Forestry Financing Fund compensates forest owners who adhere



PES schemes can ensure resilient ecosystem restoration and conservation. But basing payments solely on carbon sequestration targets can incentivise participants to plant the fastest growing plant species – which might be non-native and not conducive to biodiversity for the quickest results. The best NBS projects encompass multiple objectives alongside carbon sequestration, including positive biodiversity and social outcomes. PES projects can be explicitly designed to meet the needs and ambitions of local communities. The San Ignacio lagoon in Mexico, for example, serves as a calving ground for grey whales, and a 340,000-acre area has successfully been protected by annually paying communal landholders USD25,000 per year to limit development in the surrounding area.204

POLICY 58. Nature-based metrics for financial instruments



Governments can fund conservation efforts and protect carbon sinks with labelled sovereign issuance (policy 14). This has

already been demonstrated on a modest scale in the case of blue bonds that were issued to fund ocean conservation in Seychelles and Belize, with the Belize bond funding a debt-for-nature swap.²⁰⁵ These act in the same way as green bonds, providing investors with confidence that they are funding environmental protection.

Sustainability-linked bonds could be used to fund much wider conservation efforts. While most SLBs are linked to emissions reductions, these can also be linked to biodiversity metrics. This is similar to the sustainable land bond proposed in 2018 by Climate Bonds, with interest offsetting against land use emissions reductions.²⁰⁶ The Finance for Biodiversity Initiative has proposed nature performance bonds to invite dedicated investment into conservation and restoration activities.²⁰⁷ The first US municipal SLB, issued by the Arizona Industrial Development Authority funds forest restoration efforts, and its coupon step-up is linked to KPIs of restoring 36,000 acres of forest and increasing the proportion of logs sourced from restored woodland.²⁰⁸

Government agreements on the export of carbon credits through Article 6 of the Paris Agreement will enable capital to flow from developed to emerging markets.²⁰⁹ These can also be accompanied by other agreements, such as trade deals to lower the cost of importing renewable energy technologies, enabling developing tropical countries to play to their strengths in delivering NBS in exchange for low-carbon technologies from industrialised nations.

POLICY 59. Carbon credit market reform

Carbon credits can be used to fund conservation efforts, particularly in developing countries which may lack funds to protect conservation areas or currently rely on revenue from ecosystem resource

extraction. The Paris Agreement Article 6 rulebook establishes rules for international cooperation through carbon markets and was agreed at COP26 in 2021. This includes important requirements such as the use of corresponding adjustments to avoid doublecounting from country-to-country or projectlevel trades. The 'overall mitigation of global emissions tax' discounts the volume of credit going to the buyer by 2%. This is intended to ensure net additional reduction in emissions, rather than just offsetting CO₂ released in one country with savings elsewhere.

The review of the Article 6 rulebook, to establish whether to apply additional safeguards or limits to the use of carbon credits is scheduled for 2028.²¹⁰ However, safeguards and limits need urgent implementation to ensure carbon credits best facilitate net zero. Increasing the credit discount could discourage offset use which delays abatement.

Voluntary carbon market (VCM) reform is underway to ensure credits focus on protecting high-carbon and high**biodiversity stocks.** The Integrity Council for the Voluntary Carbon Market (ICVCM) is developing guidelines for the supply side of the market. These guidelines include an assessment framework to establish whether the project meets its Core Carbon Principles, including additionality, permanence, and positive sustainable development impacts.²¹¹

Differentiating certain carbon credits for preferential treatment could ensure credits focus on protecting high-carbon and high-biodiversity stocks. For example, credit discounts could be tiered according to the biodiversity impact of the credit, with the lowest discount applied to highly biodiverse credits.

Buy-side reform can ensure credits are only used to offset residual emissions. These are the GHG emissions that will remain from some economic activities, even after the implementation of decarbonisation technologies. For example, current CCS technologies only capture up to 90% of emissions, while aviation does not currently have a clear emissions pathway.²¹² Currently there are no limitations on who is qualified to buy carbon offsets from the market. However, producers can choose not to sell to certain buyers - awareness of the reputational risk of selling to fossil fuel companies and possibly facilitating greenwashing efforts.²¹³ However, these concerns may be swayed if fossil fuel companies offer high enough prices for offsets. Market reform is key to safeguarding integrity.

The Voluntary Carbon Markets Integrity Initiative (VCMI) was established in 2021 to provide guidance on the use of carbon credits. For example, users must set science-based interim emissions reduction targets.²¹⁴ Market reform could prohibit certain sectors from participating in the VCM or establish certain requirements for participation. This could limit the use of carbon offsets s to only hard-toabate sectors.

Requiring carbon credit buyers to have 1.5°C-aligned transition plans alongside robust transition plan requirements (policy 94) can ensure offsets do not replace or delay carbon abatement action. For example, the Climate Bonds Credible Transition Principles require that transition plan emissions reduction pathways do not include emissions reductions generated through offsets, see Figure 14.²¹⁵

The VCM is set to grow and is gaining international support on both sides of the market. For example, Japan will launch its GX League in April 2023, and companies will participate in voluntarily emissions offsetting through a national carbon credit market.²¹⁶

These actions and others by policymakers will regulate the VCM and ensure that offsets fund conservation and do not hinder progress on abatement.

Agricultural policy

With farmland constituting more than a third of the world's land area,²¹⁷ agricultural policy is crucial to achieving the lowcarbon transition. With climate



impacts increasingly threatening food security, climate mitigation and adaptation should be high priorities for ministries of agriculture. Agricultural policies will need to show ambition in line with the Transition Principles outlined in Figure 14 and take into consideration the full breadth of the agri-food system, from inputs through to consumption.

POLICY 60. Rural development strategies integrating climate & biodiversity



Naturally occurring soils are major carbon sinks, accounting for the majority of biosphere carbon storage. But agriculture and changes in land use

are degrading and eroding soils so that rather than storing carbon, soils have become a source of emissions. Current agricultural practices in many parts of the world are carbon intensive and ecologically damaging, which over time undermines resilience to climate risks and eventually renders agricultural land unusable.

Further, as the organic content of soil falls, the land is less resilient to flooding, drought and other weather-related risks.

Over time, continued mismanagement of soils is endangering food security, as agricultural land becomes unusable. Adaptation of water systems and increased fertiliser use, to compensate for the loss of nutrients, cause knock-on environmental problems elsewhere.²¹⁸ This has a major economic impact, with soil erosion alone estimated to cost the US agricultural sector USD44bn/year.²¹⁹

Ensuring climate mitigation and adaptation in rural development strategies will address carbon emissions from soil erosion and ensure resilience to climate hazards. It will also safeguard development as it means land remains productive, reduces reliance on nitrate fertilisers, and ensures food supplies.

POLICY 61. Agricultural subsidy reform

Governments should prioritise phaseout of policies that inadvertently support emissions-intensive agriculture, including policies relating to food processors and the procurement strategies of retailers. This can prevent market distortions and support investment in climate-smart agriculture.²²⁰ Gradual phaseout will prevent food price shocks. Subsidies can be redirected to fund sustainable land use, conservation, and other nature-based solutions. A 2020 study suggested that the reform of subsidies for forestry, fisheries, and especially agriculture is the single biggest way to close the biodiversity funding gap.²²¹ Measures should avoid taking highly productive land out of food production.

Costa Rica discontinued cattle subsidies in the 1980s, which saw the number of cattle in the country drop by a third and removed incentives to clear forest – the country's deforestation rate reduced significantly over the next decade.²²² Powerful reform is possible: globally, livestock accounts for 83% of all agricultural land, but only produces 18% of calories and 37% of protein.223 Cattle also account for 62% of all livestock emissions.²²⁴ With meat consumption expected to peak globally in 2030 and fall 30% by 2050, farmers can be encouraged to pre-empt a fall in demand and move away from livestock production and focus on other markets.

POLICY 62. Green preferential tax reform

Fertilisers and pesticides are carbonintensive and lead to soil degradation, with run-off polluting water and causing biodiversity loss. Switching to more

sustainable, regenerative agricultural methods, can reduce emissions and ecological damage. Taxation can direct investment to low-carbon farming methods. Fertiliser and pesticide taxes have been in place in Norway and Sweden since the 1980s, while in Argentina, organic produce is exempt from export tax.

Fertiliser production is a hard-to-abate sector, requiring R&D funding and specific subsidies to develop low-carbon fertiliser production. Taxation schemes that place higher taxes on fossil-based ammonia and fertilisers can encourage investment in low-carbon fertilisers. See Industrial policy for more policies to decarbonise this industry.

POLICY 63. Loans and grants for resilience



Improved soil management can ensure the resilience of agricultural land.

Cover cropping (planting to protect soil against rain run-off after harvest) and agroforestry (fruiting trees and/or planting crops below trees) can protect soils as they are less exposed to the erosional power of wind and rain. This also reduces fertiliser use as the decomposition of cover crops or tree litter releases nutrients and leguminous species capture nitrogen. Terraced hill farms can reduce erosion from rainwater runoff and enable more water retention.²²⁵ Government support for improved soil management can include subsidies and education on the benefits and methods of agroforestry, cover cropping, terracing etc. This can help restore degraded land and prevent further erosion.

Increasing the efficiency of agricultural land use can increase resilience, reducing deforestation pressures of agricultural land. With improved management, current agricultural land could grow enough food to feed more than double today's global population.226

Agricultural technology is advancing rapidly, and can help to maximise resource efficiency (e.g., precision agriculture and controlled environments) as well as reduce food loss (e.g., solar-powered cold chain facilities). Governments can support technological

adoption, through the provision of loans or grants or tax exemptions. Alongside this, governments can strengthen farm advisory services, targeting improved, climate-smart crop technologies and livestock husbandry practices. Government R&D should focus on the development of new technologies, including alternative proteins and innovations to stimulate the circular economy.

With farming in developing countries often characterized by smallholders, the adoption of green technology can

be difficult. Cooperatives and smallholder associations can disseminate information and enable the uptake of green technologies. Rural development strategies that maintain traditional risk-averse subsistence farming strategies such as rotational farming, while enabling market access can improve rural livelihoods, without over-exposing farmers to market fluctuations. Tackling resource constraints to adaptation (e.g., providing drought-resistant seed) can enable resilience without disrupting communities.227

Social policy

A key responsibility of governments is to ensure the wellbeing of their populations. Social priorities are closely aligned with climate priorities, particularly climate resilience, as this will minimise loss of life and social disruption.



The transition away from high-carbon activities will also rework the global employment landscape, resulting in largescale social change. Education and employment policy can ensure the population gains the skills required to access green opportunities. Ensuring equitable access to these opportunities will maximise growth and prevent instability.

POLICY 64. Climate risk communication

more ambitious action.

The social impacts of climate change are central to the argument for immediate and robust action. Even 2°C of warming, compared to 1.5°C, will result in far more frequent extreme weather events such as droughts, floods, and crop failures.²²⁸ Clear communication of these risks will help prompt

Improving awareness of climate risks and opportunities will generate voter buy-in for climate policies. It will also help generate bottom-up support for transition. Increasing public awareness of climate change is leading to increasing demand for green investments and pensions, and for green products. This bottomup pressure on investors and companies can complement top-down government action.

POLICY 65. Climate and social priority alignment

The transition provides employment opportunities and can improve equality.

However some short-term thinking can perceive decarbonisation and development as in opposition. This can be overcome by integrating climate risks and opportunities in development plans.

Faster transition is estimated to be less expensive than delayed action, which increases budgetary space for social priorities. The smoother transition resulting from prompt action also reduces the likelihood of both asset and job stranding. By ensuring a smooth and just transition, policymakers can also avoid political instability which may jeopardise climate goals.

POLICY 66. Gender inclusion in climate finance



Environmental issues can overlay or exacerbate existing social inequalities.

Indigenous people's land rights are often endangered by deforestation or pollution, with women particularly vulnerable to this. Lowerincome households will also be disproportionately exposed to climate hazards and least-equipped to adapt to them, while 80% of people displaced by climate change being women.229

There is also a risk that green opportunities will not be equally accessed by populations.

Green jobs and investment tend to be in sectors traditionally dominated by men (engineering, technology, construction, etc.). There is a danger that transition could exacerbate gender inequalities. OECD has called for targeted approach to green skills, empowering women's participation in green leadership, introducing the gender-environment nexus to support transition and women's economic empowerment.230

Incorporating gender inclusion into climate financing mechanisms would be 'smart climate finance' because women's empowerment yields greater economic

growth.²³¹ A scenario in which women participate in the economy equally to men would increase annual GDP 26%.232 Therefore policymakers can prioritise projects with maximum social and gender co-benefits, such as RE installations which end reliance on firewood collection and combustion. This would ensure greater productivity and efficient use of the workforce.

Women's education also increases climate resilience, significantly reducing the impacts of natural hazards.²³³

Including communities in conservation will reduce enforcement cost and prevent adverse social impacts. Indigenous peoples have extensive knowledge of sustainable extraction practices that

can inform wider land use practices. A key feature of successful sustainable land use management programmes is the respect for indigenous land rights, and the support of local livelihoods and economic development.

POLICY 67. Green development hubs

To stimulate growth in



underdeveloped areas, governments can establish green hubs to encourage the growth of green industries. Fast-tracking permitting for key decarbonisation technologies, accompanied by local employment and development requirements, will both ensure supply of green materials and help generate future-proof jobs.

POLICY 68. Net zero jobs strategy

Successful transition will require availability of trained workforce to avoid bottlenecks.

In addition, the net zero transition will require the closure or redevelopment of many industrial plants. Including just transition measures such as workforce retraining in the phaseout of high-carbon activities can prevent largescale job losses and create community buy-in, see policy 30, and ensure workforce availability for growth of key green industries. The European Commission's proposal for a Green Deal Industrial Plan includes skills as one of its key pillars for the green transition.²³⁴

Safeguarding the jobs that will be needed under net zero is crucial. This includes those in green industry, but also those in key services.

The UK Green Jobs Taskforce was established to assess how to provide the skills required for the low-carbon transition and how to support transition of workers in high-carbon industries.²³⁵ Expanding definitions of green jobs to include low-carbon jobs would help channel investment to support these. This would also tackle inequality as these lowcarbon jobs such as care, health and education are often mostly held by women.²³⁶

Health policy

Many health and climate change issues are closely related, with many common solutions. Uncovering these commonalities can help drive sustainable finance to both address climate change and improve health.

POLICY 69. Climate change health impact assessment

Climate change presents several threats to human health. Whilst the extent of warming is still unclear, even meeting 1.5°C will increase the frequency of extreme weather events and disease outbreaks. Therefore, strengthening the capabilities of health services to cope with these events is a crucial element of climate resilience.

Climate change will lead to more pandemics, preparedness for this, and recognition of pandemics as a climate-related risk, will ensure that such events do not derail decarbonisation, contributing to a smooth transition.

POLICY 70. Climate mitigation plans including health benefits



There will be more pandemics in the future. Climate change can directly contribute to increased disease emergence. Climate change and deforestation has dramatically shrunk ecosystems. This, in addition to increased frequency of wildfires, droughts, and floods, has led to increased encounters between humans and wildlife and therefore zoonotic spillover – the transmission of pathogens from one animal

species to another.²³⁷ Climate change is also already impacting the distribution of vectorborne diseases such as malaria.

Recognising the health benefits of tackling climate change will help direct funding to these solutions and enable health solutions to access sustainable finance flows. For example, measures to reduce fossil fuel combustion in buildings and transport will also improve air pollution-related health conditions. Coordinating air/water quality interventions with climate action can create efficiencies and reduce cost.

Halting deforestation could also reduce the emergence of zoonotic diseases. Preventative measures are more cost effective than curative measures and tend to be more effective. There is a "triple bottom line" from ecosystem protection; maintaining biodiversity, limiting climate change, and decreasing disease emergence. Recognising the synergies between health, adaptation and biodiversity conservation can create cost efficiencies in addressing them.²³⁸

POLICY 71. GSS+ issuance funding health



Defence and security

Climate change impacts are already resulting in increasing volatility and conflict.²⁴⁰ Avoiding conflict and catastrophes will be a key element of climate resilience, and climate



change is material for defence decision making and policies. Defence departments globally will need to prepare for climate-related volatility, while government leaders and diplomats working to avoid conflict will also be avoiding increased carbon emissions.

Defence policy could also provide lessons for how to tackle climate change. Many are calling for a 'war footing' for climate change. Europe's sudden transition away from Russian fossil gas imports in 2022, from 41% to 13% December 2021 to November 2022, demonstrates the speed that is possible.²⁴¹

POLICY 72. Climate risks in defence strategies



Climate change will lead to changing demands on defence capabilities. Extreme weather will likely lead to increased demand for humanitarian assistance and disaster response capabilities.²⁴²

Incorporating climate risks into defence strategies will help build resilience to climate hazards such as increasing flooding, droughts, and wildfires.

POLICY 73. Volatility resilience

Resilience to volatility is part of climate resilience. Sudden catastrophes can cause economic shocks and possible diversion of budgets. Climate change will also increase the likelihood of conflict, with impacts such as resource scarcity and displacement causing instability and unrest. Accounting for this risk of increased volatility can increase resilience of budgets, preventing the sudden diversion of resources.

Understanding the geopolitical vulnerabilities inherent in overreliance on fossil fuel imports or exports can also increase decarbonisation efforts.

POLICY 74. Conflict prevention

Conflict will not only be made more likely by climate change, but it will also contribute to it. Global militaries account for around 6% of GHG emissions.²⁴³ Warfare also results in significant environmental destruction and water pollution.²⁴⁴ International conflict has environmental impacts far wider than these direct impacts. Arguably, international conflict's greatest threat to 1.5°C is its threat to international collaboration and agreements.

War and conflict disrupt global supply

chains. Russia's invasion of Ukraine disrupted global supply chains of fossil gas, leading to large fossil fuel investments as countries tried to diversify their fossil gas supply. Such investments may delay decarbonisation plans, and possibly lead to other countries delaying fossil fuel phaseout in response.

In addition, Russia has since significantly weakened environmental legislation and oversight, including directly venting fossil gas into the atmosphere.²⁴⁵ The government has claimed that sanctions prevented it from following the (already under ambitious) decarbonisation pathway set out before the war.²⁴⁶ Countries at war and/or under severe economic sanctions may roll back climate policies, to reduce expenditure and due to removal of "peerpressure" to reduce emissions. Avoiding conflict is central to climate mitigation.

International diplomacy will play a key role in avoiding conflict and in depoliticising climate issues. This could help avoid climate agreements from failing when geopolitical tensions rise, see International relations.

Defence policy should primarily focus on tackling conflict's root causes and avoiding climaterelated conflict.²⁴⁷ This will include holistic social policies, ensuring resilient and equitable access to necessities and other resources to prevent unrest. The cost of preventing conflict is also far smaller than managing it.

POLICY 75. Defence spending decarbonisation

The need for economywide decarbonisation means that defence investments will also need to be

decarbonised. Defence is a significant source of GHG emissions, accounting for 50% of UK central government emissions.²⁴⁸ The nature of defence, and warfare means that it will likely be impossible to completely decarbonise activity and prevent environmental damage, however, significant reductions can be made. R&D to decarbonise defence could also facilitate wider emissions reductions. For example, aviation accounts for a significant portion of defence emissions, R&D to develop sustainable aviation fuels will also facilitate decarbonisation of a major hard-to-abate sector.

Justice

Climate change litigation on environmental issues has been rising, with the number of cases doubling 2015-2022. Cases have been brought to hold

governments or entities to account on their net zero targets, or to demand greater ambition. However, anti-climate cases have also been brought to challenge climate regulations or claim compensation on stranded assets. Climate litigation is expected to continue growing, as scientific progress provides more granular evidence and enables stronger attribution.²⁴⁹

The IPCC has recognised the role of litigation in affecting "the outcome and ambition of climate governance". There is growing recognition that the legal system can meaningfully contribute to climate change, with growing efforts within the legal community to target systemic climate change issues.²⁵⁰

Climate litigation, and climate law enforcement are also closely related to human rights and just transition, with human rights forming the basis for many climate cases. Enforcing conservation and deforestation legislation can also undermine or strengthen indigenous land rights, depending on their design.

POLICY 76. Environmental law enforcement

Governments' enforcement of environmental laws is crucial, to ensure protection of conservation areas and prevent illegal carbon emissions. Illegal logging and resource extraction must be controlled, as they undermine climate mitigation efforts and undercut sustainable activities in this sector.²⁵¹ The consequences of the lack of enforcement of laws are clearly demonstrated by the accelerated deforestation seen in Brazil 2019-2022.²⁵²

Enforcing climate laws is also crucial for ensuring emissions targets are met. For example, methane venting, direct release of fossil gas into the atmosphere, and leakage significantly increase the carbon intensity of fossil fuel operations. While many countries regulate against this, enforcement is low, with global energy sector methane emissions 70% higher than official figures.²⁵³ Satellite monitoring is becoming an important tool for policing emissions but will also expose poor policing, posing a political risk.

POLICY 77. Climate litigation risk mitigation



Policymakers will need to anticipate the growth of climate cases brought to challenge ambition or implementation of climate policy.²⁵⁴ There is a risk that policy



Climate litigation has played an important role in fossil fuel phaseout, challenging government support for fossil fuel use. These cases are also increasing in the Global South, with challenges mounted against exploitation of new reserves. Greenwashing cases are also increasing, these can challenge transition strategies, such as overreliance on carbon capture or offsets. Recognising the risks posed by litigation can encourage greater government ambition on climate action.

International relations

International relations encompass the government's interaction with other states or unions and are the responsibility of the Foreign Office and Diplomatic service. They are closely linked to other foreign policy



closely linked to other foreign policy areas of Trade, Development and Defence and Security.

POLICY 78. International collaboration



International collaboration and coordination are vital for the success of sustainable finance policies and climate targets. For example, international collaboration is one of the PBOC's five pillars of sustainable finance. The UNFCCC Conferences of the Parties (COP) are the most high-profile opportunity for this, resulting in the signing of the Paris Agreement in 2015. Recent years have seen increased focus on finance; COP27 resulted in an agreement on a loss and damage fund for vulnerable countries.²⁵⁵

Inter-governmental forums such as the G20 and G7 offer an opportunity to align on key policies such as fossil fuel phaseouts and international carbon pricing, enhancing the COP process. The G20 Sustainable Finance Roadmap sets out five key policy areas to advance international efforts to scale climate finance.²⁵⁶ In 2022, the G20 agreed to pursue efforts to limit the temperature increase to 1.5°C, aligning with IPCC assessments that climate impacts will be much lower at 1.5°C compared with 2°C.²⁵⁷ Other international collaborations can range from unilateral sovereign guarantee agreements, to multilateral carbon price agreements.

POLICY 79. Climate diplomacy

International diplomacy can communicate the risks and

impacts of climate change and galvanise global action. The united efforts of the Small Island Developing States (SIDS), a coalition of low-lying vulnerable island nations, have had a disproportionate impact on UN climate negotiations.²⁵⁸ Climate change impacts are highly unequal, with many regions already seeing increased hazards and loss of life. Recognising and addressing this disparity is key to the just transition, for example the loss and damage fund to assist developing countries in responding to climate change.²⁵⁹

Conflict both poses a threat to climate mitigation and is already being exacerbated by climate change, see Defence and security. International diplomacy efforts to avoid conflict can help safeguard the green transition.

POLICY 80. International capacity building

International collaboration can



also take the form of peer-to-peer capacity building. Government leadership can facilitate their departments to share their experiences in developing and implementing the policies outlined below. This will not solely be led by DM governments, as many innovative climate finance policies have been introduced in EM countries, due to constrained balance sheets, and greater climate risk exposure.

Central banks and regulators

Central banks and regulators have an opportunity to promote sustainability and ensure credibility and soundness of sustainable finance markets and investments. While central banks are independent from government, they are key policymakers in transition and the role of central banks in addressing climate change is increasing in prominence: the growing consensus that climate change poses a systemic risk to financial stability brings it firmly within central bank remits. The growth of the Network for Greening the Financial System (NGFS) to 121 members, as of October 2022, is proof of this. In addition, the threats of biodiversity loss to financial stability are such that the NGFS has declared that these fall within the CB mandate.²⁶⁰

Monetary policy

Central banks can safeguard financial stability by addressing climate change. Central banks can adapt almost all elements of their policymaking to reduce financial



stability risks from climate change, see Figure 13.

While monetary and prudential instruments are presented separately here, there is a need for coordination of these policies to address climaterelated risks. CB COVID-19 response measures demonstrate how policy innovation can address systemic risks.²⁶¹

POLICY 81. Green asset purchase

Central banks' reluctance to address climate change partly stemmed from concerns of distorting financial markets and impacting price stability, the main focus of their mandates). This particularly limits green monetary policy, as asset purchase is carried out in accordance with market neutrality, replicating market distribution to avoid market distortion. However, they are increasingly recognising that 'market neutral' approaches under-price climate risk and can overly favour high-carbon assets due to their dominance of financial markets and are introducing measures to align asset purchase with climate goals.²⁶² Adjusting monetary operations away from the market neutrality principle and towards climate neutrality can help ensure financial stability and resilience to climate-related risks.

Since 2018, the Banque de France has aligned the equity portion of its EUR23bn asset portfolios with a below 2°C trajectory and is now working to align it with a 1.5°C trajectory. This is done by filtering out those companies least compatible with 2°C and preferencing companies aligned with the target. It also purchased EUR1.6bn of its EUR1.9bn transition financing target by the end of 2021.²⁶³ Sweden's Riksbank made inclusion in its corporate bond QE conditional on compliance with sustainability standards.²⁶⁴

During periods of monetary expansion, the CB can tilt asset purchases to green. The European Central Bank (ECB) now tilts all corporate bond purchase using an issuer-specific climate score, based on past emissions, ambition of climate targets and disclosure quality.²⁶⁵ This composite score also enables the transition of emissions-intensive companies as the score is not solely based on emissions.

Figure 13: Options for greening central bank operations

| Central Bank | | | | | |
|---|--|---|--|--|--|
| Prudential | | Monetary Bank balance sheet | Central Bank balance sheet | | |
| Micro | Macro | Indirect | Direct | | |
| Supervisory review Liquidity requirements Capital adequacy Mandatory ESG risk management standards | Loan-to-value and loan-to- income caps Large exposure restrictions Risk weighting | Credit operations pricing Conditionality of credit operations | Interest Rate Exchange rate Minimum Reserves | | |
| | | Collateral frameworks | Non-standard Quantitative | | |
| Stress testing Disclosure requirements | | Haircuts Asset Eligiblity | Easing Asset Purchase Sovereign bond purchase | | |
| | | | | | |
| | Countercyclical capital buffers | Credit guidance Targeted refinancing Priority sector lending | Own reserves Eligibility | | |

The CB can still green its portfolios during monetary tightening. For example, the ECB will tilt purchases to better climate performers more strongly during partial reinvestment. It is also considering actively reshuffling the portfolio to greener issuers to meet climate targets.²⁶⁶

POLICY 82. Green foreign exchange reserves

Like asset purchases, foreign exchange reserves can be adjusted to take climate risk

into account. For example, Sweden's Riksbank applied climate risk weightings to a portion of its SEK500bn foreign exchange reserves and excluded bonds from the highly fossil fueldependent provinces of Alberta, Canada and Western Australia and Queensland, Australia.²⁶⁷ Hungary's MNB created a dedicated green bond portfolio within its foreign exchange reserves in 2019.²⁶⁸ However, such adjustments will need to be made carefully in order to avoid restricting the ability of highly polluting states to decarbonise. With growing concern over the impact of transition risk on cost of capital for emerging markets, such policies could include sensitivity to transition plans.

POLICY 83. Collateral framework adjustment

Collateral frameworks can be adjusted to account for the climate risk of an asset. The collateral framework has a significant impact on the price and allocation of capital.

It determines what assets an FI can pledge to receive a loan from the CB. This Several central banks have widened the framework, for example the ECB includes sustainability-linked bonds. The PBOC includes AA-rated green bonds and credit, citing the lower non-performing loan ratio of green loans.²⁶⁹

A haircut (reduction in value) is applied to pledged assets based on their riskiness. This is traditionally calculated based on historical data. Incorporating climate risk will allow better resilience to future systemic risk- as outlined regarding risk weightings for capital and reserve requirements above. Adjusting the haircut allows for a scaled approach to green monetary policy.

Calculation of green supporting or brown penalising factors may require evidence from climate stress tests, and their strength may also depend on whether the CB feels it is within its remit to actively promote net-zero transition. The NGFS suggests the most impactful haircut adjustment to be one that uses a sliding scale combining positive and negative screening, and that this would prevent constraints to liquidity by ensuring post-haircut collateral volume remains constant.²⁷⁰

POLICY 84. Climate-tilted credit operations

Central banks can adjust credit operations to reflect climate risk. This can be done by adjusting the interest rate of lending facilities to reflect counterparties' climaterelated lending, or according to carbonintensity pledged collateral. For example, the Bank of Japan offers a zero-interest rate to Fls that finance climate mitigation projects in Japan, exempting these loans from negative interest rates paid on central bank deposits. The announced programme replaces an earlier, growth-oriented lending facility, which provided 0.1% subsidy to banks that financed projects deemed to contribute to economic growth.²⁷¹

Availability of lending can also be made conditional on climate-related disclosure or the proportion of green investments. For example, during the COVID-19 pandemic, Canada introduced a Large Employer Emergency Financing Facility, access to which required TCFD disclosure among other constraints.²⁷⁷ However, uptake was limited (a total of seven loans approved) since finance was also available to firms through the Bank of Canada's asset purchasing programme on less onerous terms.²⁷³ This demonstrates the need for consistency across financing facilities provided by the CB and government.

POLICY 85. Green credit guidance

Credit guidance is used by a limited number of central banks. This is when the CB mandates that a certain share of loans is issued to specific sectors or that firms in those sectors have access to credit at discounted interest rates. It could be used to channel lending to key transition activities.

Green targeted refinancing lines offering preferential refinancing for specific green assets enable FIs to lend at lower interest rates to sustainable projects. This is most relevant in economies with relatively underdeveloped secondary security markets as they lack marketbased refinancing options.²⁷⁴

Asian central banks have used priority sector lending to increase the supply or reduce the cost of credit for specific sectors, either underserved by financial markets or strategically significant. The Reserve Bank of India added renewable energy as a priority sector in 2015, causing RE portion of energy sector bank credit to grow from 5.4% to 7.9% by 2020. Bangladesh Bank requires financial institutions to allocate 2% of all loans to green projects and for 15% of all loans to meet a wider definition of supporting 'sustainable' activities.²⁷⁵ The ECB has suggested it will look at green targeted lending when its monetary policy becomes expansionary again.²⁷⁶ These mandatory credit quotas have the potential to create severe market distortions and should be carefully evaluated against other less distortive incentive measures such as preferential treatment of green lending. Rather than setting a hard quota, central banks could offer preferred interest rates for priority sectors; setting interest rates to promote sustainable and curb unsustainable lending, however this is still a highly interventionist policy.²⁷⁷

Prudential regulation

Within prudential regulation, central banks can take action to ensure systemically important financial institutions adequately integrate



climate risk. Prudential regulation is primarily guided by the Basel Committee on Banking Supervision (BCBS). Basel III is its global framework for regulation, covering minimum capital requirements, supervisory review, and market discipline. A review of its core principles and supervisory review process concluded these were sufficiently broad to accommodate supervisory response to climate change, However, they do not explicitly account for climate risk. Individual CBs will need to take steps to address climate-related risk exposure until the Basel Framework explicitly integrates climate-related risks, particularly given the long timelines to update the framework.

BCBS recently issued 18 principles for the effective management and supervision of climate-related financial risks, to provide additional guidance on addressing climate-related financial risks.²⁷⁸ Central banks can use these principles to inform FIs about their expectations for the management and disclosure of climate and environmental risks.²⁷⁹ For example, the BCBS principles suggest compensation policies could be altered to include climate risk.

Central banks will also need to evaluate prudential regulation to ensure that it does not unintentionally adversely impact green investment. For example, Basel III stipulates a higher capital requirement for long-term credit because long-term loans are considered riskier. This disproportionately impacts sustainable finance projects as infrastructure projects are, by nature, long-term.²⁰⁰

POLICY 86. Climate stress testing

Climate stress testing (carried out top-down by the CB or bottom-up by individual FIs) is an important

tool to reveal sources of climate risk vulnerability within the economy. This can also prompt FIs to take action to improve

can also prompt FIs to take action to improve climate resilience and can inform monetary and prudential policy operations. Central banks can make use of the NGFS scenarios for national scenario development and stress testing. These six scenarios provide supervisors with various 30-year forward projections of climate mitigation policies and physical climate risks.²⁸¹

One of the most comprehensive climate stress tests has been carried out by the ECB. This assessed the physical and transition risks facing 2,000 banks and 4 million companies worldwide over 30 years. This showed the heterogeneity and significant concentrations of physical and transition risk exposure across regions, sectors, and financial institutions. This stress test also explored complexities posed by the amplification of natural hazards, such as protection gaps (non-insured losses). The 2022 supervisory stress tests focus on climate-related risks, carried out as a learning exercise without directly impacting capital requirements. The results of the test found climate risks to be relevant for the majority of supervised institutions, with high reliance on interest income from high-emitting sectors but a lack of long-term strategies to transition credit allocation.282

Some central banks, particularly in EM, may not have the capacity to carry out economywide stress testing. However, they could test a specific risk to which it is particularly exposed. For example, De Nederlandsche Bank stress tested physical flood risks, revealing potential losses of EUR20-60bn.²⁸³ The National Bank of Belgium's 2020 Financial Stability Report included an article on real estate transition risk exposures in the Belgian financial sector and recommended that "financial institutions analyse the extent to which the energy inefficiency of their real estate exposures could have an impact on current and future credit risks, and to take measures to manage and limit this transition risk" 284

POLICY 87. Climate disclosure requirements

A major barrier to stress testing, and the introduction of climate criteria in monetary

policy, is a lack of data.²⁸⁵ The lack of Scope 1,2 and 3 emissions, and the use of proxies by financial institutions for emissions data can be addressed by mandatory climate disclosure requirements.²⁸⁶ These are increasingly being introduced by central banks and can also inform policy and prompt FI action. Disclosure requirements can follow the framework set out by the Taskforce on Climate-related Financial Disclosures (TCFD).²⁸⁷ Aligning prudential disclosure requirements with those for other financial market participants ensures consistency of data. Several central banks now make their own climate disclosures. This provides an example and strong signal to the market. Assessment of climate risks and opportunities will also inform climate-related policymaking.

POLICY 88. Green capital and reserve requirements

Central banks can adjust risk weightings for capital and reserve requirements to include climate risk. Risk weightings normally rely on historical data, and so central banks can add a green-supporting or brown-penalising factor to incorporate future climate risks. For example, Hungary's CB introduced preferential capital requirements for green mortgages, by discounting capital requirements against lenders' balance sheet exposure to green mortgages. This was based on the lower risk of default on green mortgages.^{289 290} PBOC has included green credit in its macroprudential assessment, with a higher level of green assets improving a bank's score.²⁹¹

Mandatory ESG risk management standards require financial institutions to incorporate E&S risk factors into their governance

frameworks. These may include rules for lending, such as obliging banks to include an assessment of E&S risks as a criterion for loan origination. This reduces the flow of finance to polluting firms.²⁸⁸

POLICY 89. Carbon capital buffer

Some CBs require financial institutions to hold a counter-cyclical capital buffer, with which to absorb potential losses. This is increased when risks build in the financial system. CBs could introduce a carbon capital buffer; whereby financial institutions are required to hold a certain volume of capital proportionate to the emissions intensity of their portfolio. A carbon capital buffer could simultaneously provide resilience to transition shocks and 'carbon bubble' risks and create economy-wide incentives to allocate finance away from high-carbon sectors and technologies.²⁹² No central bank has yet implemented a carbon capital buffer.

A carbon capital buffer, or a brown penalising factor on risk weighting would need to be carefully evaluated to ensure that it does not reduce the capital available to transition highcarbon corporates.

Large exposure restrictions (by counterparty, sector, or geographic area) are employed to limit the exposure of financial institutions to assets entailing high risks or high carbon intensity. This can protect financial institutions against a carbon bubble but could also be employed for the fine-tuning of lending restrictions and credit allocation. Loan-to-value and loan-to-income caps could Eligibility of these loans for preferential reserve requirements could be verified by a climate science agency, which could assess whether the underlying investments would contribute to greening the energy sector and declare the bank loans that finance them eligible.

Risk weighting adjustments are a powerful tool for the central bank to increase green lending, without incurring additional expenditure. They can also be made by central banks with even very narrow mandates as they address financial stability risks, rather than promote sustainable development or other such secondary objectives.

Central banks could also introduce normative green capital requirements – in addition to Basel capital requirements. This is only possible in markets with a large enough pool of green debt.

also be used to limit the extension of credit to certain industries and limit the flow of resources to carbon-intensive sectors or companies.²⁹³

POLICY 90. Sustainable finance research and analysis



CB research and analysis can play an important influential role in growing sustainable finance, for example, the research produced by the NGFS.²⁹⁴

They can also play an instrumental role in green Taxonomy development; ASEAN central banks led the development of the regional taxonomy and several national taxonomies. Through the promotion of this research, and the introduction of some of the policies outlined below, central banks can signal the importance of climate change issues to market participants and encourage further action, beyond that incentivised by specific policies.²⁹⁵

Supervisors and regulators

POLICY 91. Climate consideration requirements



Financial market regulations can be updated to include climate change considerations to ensure that product offerings match retail clients' environmental preferences in pensions, investments,

and insurance. The French regulator found that despite strong retail investor interest in sustainability, only 17% reported holding at least one related investment.²⁹⁶ Product level disclosure rules require amendment to make sure that consumers' sustainability preferences are considered in the financial advice and marketing of products.²⁹⁷ The European Securities and Markets Authority is partly responsible for drafting technical norms for integrating sustainability preferences. These require firms to ask clients about their sustainability preferences and identify the products that fulfil these. It has also released proposed amendments to its Suitability Guidelines to outline how it expects sustainability considerations to be built into the suitability process.²⁹⁸ The US Securities and Exchange Commission has proposed norms to enhance disclosures about ESG investment practices.²⁹⁹ It will review its "names rule", which requires fund investments to reflect the name, to adapt it more specifically to ESG investing.³⁰⁰

Regulators can embed climate risk considerations into senior leadership

requirements, integrating responsibility for climate risk into board accountability and due diligence requirements . Including double materiality ensures boards consider impact on climate, as well as climate risk exposure. In the UK, bank and insurer boards and leadership teams are required to have climate oversight, partly due to increasing climate liability risks.³⁰¹ Legal action against financial institutions or companies whose activities negatively impact the environment, or who fail to protect their clients from climate-related risk have risen significantly, see policy 77.³⁰²

The EU's proposed Corporate Sustainability Due Diligence Directive would require companies to adopt a plan to make their business model and strategy compatible with 1.5 °C, but only requires emissions reductions objectives for those for which climate is a principal risk for or a principal impact of the company's operations.³⁰³ Requiring near- and long-term emissions reduction targets from all companies in the Directive's scope would strengthen its impact and help embed sufficient ambition in corporate transition plans.³⁰⁴

POLICY 92. Regulatory KPIs

Regulatory KPIs can be established to nudge financial institutions to allocate their capital towards green or transition activities through capital regulations. These measures do not put stability of the financial system at risk if designed carefully and are nondiscriminatory (i.e., if all financial institutions in a given jurisdiction have an opportunity to take advantage of this measure). It is very important to set KPIs for financial institutions and development banks in alignment with sciencebased green taxonomies. Vague KPIs, aligned, for example, the SDGs, may be too vague and inefficient in terms of decarbonisation.

POLICY 93. Climate disclosure requirements



Regulators are increasingly establishing climate disclosure

requirements. While these do present a large administrative burden, disclosure is a valuable tool to assess alignment with a 1.5°C pathway, encourage FIs and corporates to decarbonise their activities, enable enforcement of targets and phaseout dates, and inform climate-related risk assessments and stress tests. Corporate disclosure requirements can also enable financial disclosure.

For example, the Swiss Financial Market Supervisory Authority mandated the largest banks and insurers to disclose climate risks based on the TCFD recommendations from 2022. This includes the financial risk that a company incurs as a result of climate-related activities and the impact of the company's business activities on the climate and the environment (double materiality).³⁰⁵ Double materiality ensures a comprehensive understanding of the climate risks incurred by an investment.

The European Commission's Sustainable Finance Disclosure Regulation (SFDR) applies to all financial market participants, requiring entity and productlevel disclosure on sustainability risks and principal adverse impacts. The sustainability reporting regime also includes Taxonomy Regulation disclosures on turnover, capital expenditure, and operating expenditure from Taxonomyaligned products or activities.³⁰⁶ The Corporate Sustainability Reporting Directive (CSRD) requires large and listed European companies (3/4 of all EU-based companies) to publish audited sustainability data.³⁰⁷ Companies will make CSRD reports from 2025. The standards ensure that companies are reporting the information required by investors and FIs and include indicators that correspond to those applied to FIs.

Regulators can also introduce naturerelated disclosure requirements, following the recommendations of the TNFD. These

follow the TCFD structure, aiming for double materiality in disclosures of nature-related risks and opportunities. TNFD disclosures will encourage actors to address vulnerabilities and adverse impacts.³⁰⁶ In 2021 France extended investor reporting requirements to biodiversity-related risks. While challenges remain with data access, this will increase awareness and enable management of nature-related risks.³⁰⁹

A clear roadmap for disclosure requirements ensures companies have time to prepare

for disclosure. The PBOC Guidelines for Environmental Information Disclosure by Financial Institutions were piloted in its green finance innovation zones.³¹⁰ Guidance from supervisors is key to minimising compliance costs and ensuring meaningfulness and comparability of disclosed data. Guidance from the Dutch supervisor prompted some sustainable funds to reclassify their funds (dark green to light green) under SFDR, given the regulator's stricter disclosure demands for dark green funds.311 Regulators can standardise key metrics that need to be disclosed, establishing tools for data capture. To reduce the burden of data collection, they can also capture data at a national level and ensure data is easily available to investors. For example, the European Single Access Point (ESAP) will provide centralised and digital access to sustainability-related information disclosed by European companies.312

Many financial institutions will likely be disclosing in several jurisdictions. Therefore, as with taxonomies, it is important to improve the international alignment of disclosure requirements. This can reduce the burden of disclosure, likely improving quality of disclosed information.

POLICY 94. Transition plan requirement and assessment

Credible company transition plans are crucial to ensuring transition finance

flows are aligned with 1.5°C, see Figure 14. An immediate step is to require investors and corporates to set and publish transition plans. For example, UK and EU sustainability disclosure requirements include net-zero transition plans.³¹³ EU disclosure laws can be strengthened to require setting, not just disclosing, transition plans. Requirements can also be accompanied by guidance and templates for plan construction.

The regulator can then introduce risk tools for long-term assessment of transition plans and their impact on exposure. Basing these on robust standards such as the Climate Bonds transition and entity criteria will ensure credibility and speed of transition.³¹⁴ Robust accountability frameworks are crucial to ensure timely company transitions.³¹⁵

Transition plan assessment criteria and detailed requirements can ensure the strength of these plans. For example, the OECD Guidance on Transition Finance recommends consideration of other nonclimate sustainability impacts.³¹⁶ Including nature in practice guidance and requirementswill ensure a holistic approach to transition.³¹⁷

Transition plan assessment can also inform eligibility for subsidies and preferential treatment. For example, the ECB's corporate bond tilt is based on issuer-specific climate scores, which are partially based on ambition of climate targets.³¹⁸ Similar schemes could be based on credibility of transition plan assessments. These assessments would not only prompt companies to transition their activities, but also ensure that funds are available for hard-to-abate transition.

POLICY 95. Stock exchange climate listing requirements

Stock exchange listing requirements ensure investors are adequately informed

before making an investment. The regulator can ensure listing requirements include ESG reporting. Companies listed on the London Stock Exchange have been required to report carbon emissions in their annual strategic report since 2013.³¹⁹ Singapore Stock Exchange is phasing in mandatory TCFD-based climate reporting, beginning with 'comply or explain' reporting for the financial year commencing 1 January 2022.³²⁰

POLICY 96. Rating agency climate assessment disclosure requirements

Credit rating agency assessments are an important consideration for investment decisions and are used in monetary policy.

Figure 14: Climate Bonds Principles for a Credible Transition



1. In line with 1.5

degree trajectory. All goals and pathways need to align with zero carbon by 2050 and nearly halving emissions by 2030





cience. Il goals and pathw

2. Established by

must be led by scientific experts and be harmonised across countries.

3. Offsets don't count. Credible transition goals and pathways don't count offsets, but should count upstream Scope 3 emissions.

Robust integration of climate risk into credit ratings will ensure capital flows take climate risk into account and will help shift capital to green. While climate risks are considered in ratings, the extent of this is unclear. Regulators can require more granular disclosure on how climate risk is assessed in methodologies.³²¹ Given the longer time horizons of climate risks and transition, a short-term financial rating could view a transition investment as an increase in borrowing and a source of credit risk, which could dissuade entities from investing in transition for fear of downgrade and increased cost of borrowing. Regulators can require transparency on the time horizons of credit risk assessment to ensure all risks are appropriately assessed.322

Policymakers and regulators can require transparency of ESG rating methodologies and purpose, differentiating between physical and transition risks. This would ensure market participants are better informed on how to use ESG ratings for asset allocation and portfolio assessment.³²³

POLICY 97. Green taxonomy and standards





4. Technological viability trumps economic

competitiveness. Pathways must include an assessment of current and expected technologies. Where a viable technology exists, even if relatively expensive, it should be used to determine the decarbonisation pathway for that economic activity.

5. Action not pledges.

A credible transition is backed by operating metrics rather than a commitment/pledge to follow a transition pathway at some point in the future. In other words, this is NOT a transition to a transition.

Taxonomies' environmental objectives will be informed by national environmental policy and priorities. Including other objectives such as biodiversity, circular economy and pollution prevention widens the scope of activities that can be included and ensures that these other environmental objectives are not disadvantaged in terms of financial flows. Including biodiversity activities in a taxonomy can also provide clarity on what projects contribute to biodiversity and climate objectives. These can draw on the International Finance Corporation (IFC) Biodiversity Finance Reference Guide.³²⁴

For their criteria to best meet the needs of the sustainable transition, these need to be sciencebased, usable and aligned with both global and local standards. For example, in China, different types of green bonds had to reference different guidelines from the corresponding regulators. In 2021, the PBOC, the National Development and Reform Commission, and the China Securities Regulatory Commission jointly revised and released the Green Bond Endorsed Project Catalogue.³²⁵ The updated Catalogue was a crucial step in developing a standardised green bond market because it unified domestic standards.

Global alignment will enable international flows of capital and prevent market fragmentation, particularly vital for countries without a strong local investment base.³²⁶ It will also reduce the burden on international investors who will likely be working with several different taxonomies. Taxonomy developers can use the IPSF's EU-China Common Ground Taxonomy (CGT) as a basis for taxonomy development. For example, Hong Kong has adopted the CGT and it will be operationalised by the Green and Sustainable Finance Cross-Agency Steering Group.³²⁷ This was to facilitate international collaboration and enable them to act as a hub for capital flows.

POLICY 98. GSS+ bond guidelines

Supervisors can set out GSS+ bond guidelines and frameworks. These can help standardise the local market which reduces investor due diligence and facilitates transparency efforts. Many green bond guidelines are aligned with the ICMA Green Bond Principles³²⁸ and Climate Bonds Standard.³²⁹ Alignment with ICMA will create consistency with international markets and ensure local issuance meets investor expectations. Such guidelines can also be set out for green and sustainability-linked loans (SLLs), drawing on the SLL guidelines.³³⁰

Guidelines can help kickstart local green bond markets. The PBOC 2015 guidelines for the issuance of green financial bonds in the interbank bond market were accompanied by the first edition of the Green Bond Endorsed Project Catalogue and led to rapid scaling of Chinese issuance.³³¹

Jurisdictions with green bond guidelines already in place can expand their guidelines to also cover social and sustainability issuances.

For example, the Moroccan Capital Markets Authority expanded its Guidelines in 2018 to cover green, social and sustainability bonds with support from IFC.³³² This also illustrates how supervisors can leverage development bank or other expertise to assist with guideline development, overcoming capacity issues that may be present particularly in EM.

Guidelines are also being developed for sustainable sukuk. Sukuks are shariah lawcompliant debt instruments, well-suited for GSS issuance given the overlap between Islamic finance principles and sustainability principles. The Malaysian Securities Commission's updated Sustainable and Responsible Investment-linked Sukuk Framework builds on guidelines first issued in 2014.³³³ Sukuk issued under the Framework or bonds issued under the ASEAN GSS Bond Standards are eligible for a grant scheme covering up to 90% of external review costs.³³⁴ This demonstrates how frameworks can facilitate the implementation of grant and incentive schemes.

POLICY 99. Green regulatory sandboxes

Regulators can support green and sustainable financial innovation by establishing regulatory sandboxes that allow financial products to be tested in a controlled environment, exempt from compliance with regulatory requirements. Complying with such a regulatory framework is the biggest barrier to entry for financial services providers. Once these are tested, and if successful, they can be launched onto the market and required to comply with the regulatory framework in place. The UK's Financial Conduct Authority promotes innovation in finance to support the transition to net zero through its Green Fintech Challenge and Digital Sandbox.³³⁵

POLICY 100. Green securitisation framework

Regulators can establish a green securitisation framework. Securitisation involves the aggregation and packaging of loans into a larger debt product to reach institutional investors' minimum bond sizes. This enables banks to move those assets off their balance sheet and originate more green loans within their capital requirements. Establishing standards for loan contracts, installation processes, operations, and management creates consistency boosting securitisation.

Including green assets, e.g., renewable energy and low-carbon transport assets, as eligible assets in covered bond legislation could also boost green bond issuance. Green covered bonds provide an opportunity to increase transparency to underlying green assets and provide a bridge between bonds with entity recourse and pure asset-backed securities, where bondholders are reliant solely on the performance of a defined pool of assets.³³⁶

POLICY 101. Stock exchange green bond segment

The regulator can work with the stock exchange to establish green bond/equity segments to increase the visibility of sustainable finance instruments.337 The segments' listing requirements also provide investors with certainty about the issuance, reducing due diligence requirements. 38% of exchanges have ESG bond segments according to Sustainable Stock Exchange Initiative which provides guidance to stock exchanges on growing green finance.³³⁸ Fast tracking green products provides further incentive for issuance. For example, Shanghai Stock Exchange and Shenzhen Stock Exchange offer fast tracks for green corporate bonds.³³⁹ In addition, the exchange can work to promote the benefits of

Supervisors and regulators can also provide economic actors with advice and capacity building on sustainable finance activities, to encourage and enable action. A specific entity can be set up to deliver this. Capital Markets Malaysia was set up by the Securities Commission, to provide capacity building to issuers, investors, and intermediaries.³⁴⁰ Capacity building can also be provided to support the development of local expertise in green bond verification and second-party opinion provision. This can help kickstart local green bond markets and reduce the cost of obtaining verification.

green products, and of listing them publicly.

The way forward

Achieving a 1.5°C world will require mitigation and adaptation investments in all aspects of the economy. By embedding these investments in development

strategies, policymakers will be able to grasp the growth opportunities of transition. Crucially, a rapid transition to net zero makes economic sense and will result in billions of savings, on reduced climate damage, job creation and avoided stranded assets.

The capital is available to finance transition.³⁴¹ The challenge is in directing this capital to climate mitigation and adaptation priorities, and sufficiently de-risking projects for investment.

Policymakers are key to this reorientation of finance flows. It is key for all government departments, central banks, and regulators to be actively working towards transition, within a clear and coordinated policy framework. A sustainable finance policy framework enables policymakers to capture private finance flows and deliver greater decarbonisation levels. This means governments could increase the climate ambitions of their NDCs, if they consider the increased levels of finance they are able to access to fund decarbonisation.



Each country will be starting from a different point, however certain key policies can help kickstart flows of sustainable finance to deliver decarbonisation. These critical factors of success include:

Policy 1.

Development plans incorporating climate targets and carbon budgets. 1.5°C-aligned national and sectoral carbon budgets ensure sufficient ambition of policies and avoid incremental change which could lead to asset stranding.

Policies 81, 88.

Central banks recognising climate risk as a risk to financial stability and incorporating climate risk in asset purchase and reserve requirements will both help to shift investment away from high-carbon assets, and to insulate the economy from climate-related risks which could result in financial instability.

Policies 10-13.

Sustainable finance incentives, tax credits, and subsidies to derisk green and

sustainable investments.

Policy 19.

Ramp up of blended finance offerings to overcome the very low risk appetite of institutional investors and direct capital to more nascent technologies and higher-risk markets.

Policies 49, 97.

Science-based green standards or taxonomy to provide clarity on what is a green/resilient investment, enabling capital to move at scale.

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