

Raisina-IE Global Student Challenge
Bringing together perspectives on renewed global governance

Policy Solutions for the International Climate Change Regime

A Proposal to get Back on Track

Adapting NDCs with Sectoral Climate Commitments and Digital Accountability to Reach Long-Term Low-Emissions Development, and Rethinking Forms to Finance Climate Change Mitigation and Adaptation to Enable Systems Transformation

A Harmonized Proposal prepared by Teams 1, 2, 3, 4, 5

Academic Advisors:

Dr. Ángel Alonso Arroba, IE School of Global and Public Affairs, Spain

Dr. Claudia Yoshinaga, São Paulo School of Business Administration of Getulio Vargas Foundation, Brazil

Dr. Robert Mizo, Department of Political Science, University of Delhi, India

April 2024

Word count: 2998 words



Acknowledgements

This policy paper was prepared for the 2024 Raisina-IE Global Student Challenge, held from 29/01/2024 through 31/03/2024.

The paper is based on the policy proposals written by the 5 teams that participated in the Challenge. The participants are:

Team 1 – Irene Pérez Beltrán, Sciences Po Paris (France), Conrad Buffier, Australian National University’s Crawford School of Public Policy (Australia), Martín Illanes, UC Chile (Chile), Adugna Roro Wakjira, Addis Ababa University College of Developmental Studies (Ethiopia).

Team 2 – Amira Fekry, American University in Cairo (Egypt), Qazi Fariha Iqbal, University of Dhaka (Bangladesh), Ibsam Qureshi, Hankuk University of Foreign Studies (South Korea), Tobias Scholz, King’s College London (UK) & National University of Singapore (Singapore).

Team 3 – Virendra Kumar, University of Delhi (India), Peng Liu, NYU Abu Dhabi (UAE), Shantanu Roy-Chaudhury, Nanyang Technological University, (Singapore), Karina Sánchez-Bazán, Tec de Monterrey’s School of Government and Public Transformation (Mexico).

Team 4 – Emmanuel Capochichi, IE School of Global and Public Affairs (Spain), Devanshi Patnaik, Georgetown University (USA), Mancha Johannes Sekgololo, University of Johannesburg (South Africa).

Team 5 – Aurelie Chapon, Munck School of Global Affairs and Public Policy of the University of Toronto (Canada), Abdul Omar Maziko, Tsinghua University-Beijing (China), Joy Isoyiza Usman, University of Ibadan (Nigeria), Bruno D. Ygosse Battisti, São Paulo School of Business Administration of Getulio Vargas Foundation FGV EAESP (Brazil).

The authors are grateful for the constructive comments and supervision of each team’s work by the challenge’s academic advisers, Dr. Claudia Yoshinaga, Associate Professor of Finance of the São Paulo School of Business Administration of Getulio Vargas Foundation (FGV EAESP) in Brazil, Dr. Robert Mizo, Assistant Professor in the Department of Political Science at the University of Delhi in India, and Dr. Ángel Alonso Arroba, Professor and Vice Dean for Management and Development at IE School of Global and Public Affairs in Spain.

Executive Summary

The **2024 Global Stock-take** revealed that Parties are off track to meeting the Paris Agreement goals. This calls for adjustments of the **National Climate Commitments (NDCs)** approach, a reassessment of how to hold global actors accountable to reach **Long-Term Low-Emissions Development** and to rethink forms to finance Climate Change Mitigation and Adaptation to enable **Systems Transformation**.

To get the Parties back on track, we propose a shift towards a **Sectoral Approach** for Climate Change Mitigation and Adaptation Commitments, with state and non-state actors' achievements with respect to reaching low-emissions goals and honoring their climate commitments monitored by a **transparent Digital Climate Accountability Framework**, which visualizes all actors' emissions-reduction paths on a continuous basis, providing a **Global Continuous 'Flow-take'** and functioning as an **enforceability mechanism**. To enable change and systems transformation, we propose to **rethink forms to finance innovations** needed to promote and accelerate systems transformation. We propose that the Digital Climate Accountability Framework also monitors and visualizes all financial flows, from origin to destination, between countries and towards mitigation or adaptation.

Key words: Paris Agreement, NDCs, Long-Term Low-emissions Development (LT-LED), Systems Transformation, Sectoral Approach, Digital Climate Accountability Framework, Global Continuous 'Flow-take', Enforceability Mechanism, Financial Innovations to Finance Climate Change Adaptation.

List of Abbreviations

ACTO	Amazon Cooperation Treaty Organization
AI	Artificial Intelligence
APAEC	ASEAN Plan of Action for Energy Cooperation
CO2	Carbon dioxide
GCAP	Global Climate Action Partnership
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse gases
IoT	Internet of Things
LT-LED	Long-Term Low-Emissions Development
MDBs	Multilateral Development Banks
NDCs	Nationally Determined Contributions
REPP	Renewable Energy Performance Platform
RGGI	Regional Greenhouse Gas Initiative
SDRs	Special Drawing Rights
UNFCCC	United Nations Framework Convention on Climate Change

Table of Contents

1	Introduction.....	6
2	Proposal.....	7
2.1	Pillar 1: Adapting NDCs with Sectoral Emission-Path Goals.....	7
2.2	Pillar 2: Improving Financing of Innovation needed for Systems Transformation.....	8
2.3	Pillar 3: A Digital Accountability Framework	9
3	Implementation.....	11
	References.....	15

1. Introduction

The urgency of intensifying actions to reach the Paris Agreement goals in time has become more evident, as 2023 became the warmest year on record (WMO, 2024). One of the main takeaways of the first global stock-take was that “[...] Parties are off track when it comes to meeting their Paris Agreement goals” (UN, n.d.), This calls for an assessment of how to get Parties back on track.

Despite the collective efforts of state and non-state actors, global progress remains insufficient to achieve the 1.5 °C threshold (UNFCCC, 2023; IEA, 2023). In our assessment, in order to get back on track the international community must rethink the way we look at how to achieve low-carbon emissions, by focusing on sectors rather than countries, even within a country-setting. We see this as **Pillar 1** of our joint proposal. Secondly, there is clearly more financing needed for innovation and Climate Change adaptation to enable systems transformation, while currently the vast majority of Climate Change Financing goes towards mitigation. New financing schemes are **Pillar 2** of our proposal. Finally, we consider that the current model not only lacks transparency, but its 5-year “Global Stock-take” generates delays of awareness of whether or not we are on track that we cannot afford, as these delays make it harder to make timely adjustments. Therefore, **Pillar 3** of our proposal put forward a new way to enforce actors’ compliance with Climate Commitments, in the form of a Digital Climate Accountability Framework.

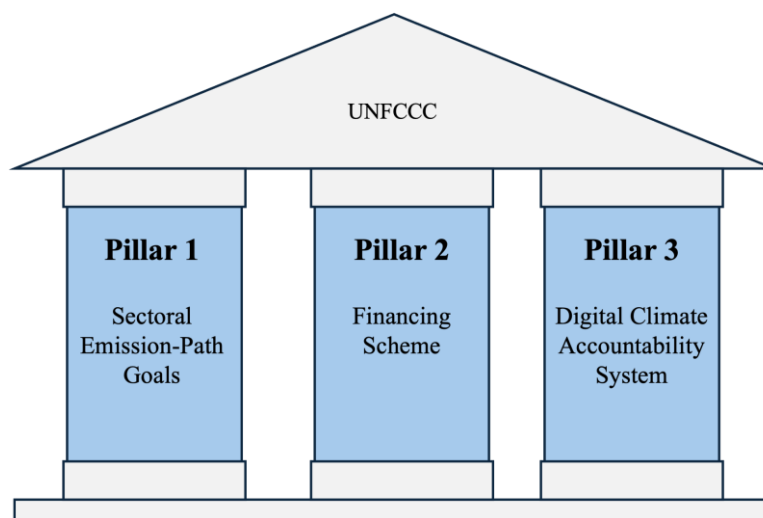


Figure 1: Overview of the framework
Note: authors’ elaboration.

The main objectives of this proposal are: (1) to justify why it is helpful to adapt the Nationally Determined Contributions (NDCs) with **Sectoral Emission-Path Goals** and how that can be achieved; (2) to introduce a **Digital Climate Accountability Framework** that provides a more transparent and continuous visualization

of all actors' emissions-reduction paths; and (3) to provide suggestions how to **improve Financing** for much needed innovation to enable Climate Change adaptation on sectoral and country-level. We deem the latter a necessary condition to enable and accelerate systems transformation. Section 2 explains the rationale behind these components of our proposal. Section 3 describes how the key components of our proposal can be implemented within the **International Climate Change Regime**.

2. Proposal

2.1 Pillar 1: Adapting NDCs with Sectoral Emission-Path Goals

Nationally Determined Contributions (NDCs) are commitments made by countries under the Paris Agreement to curb their future emissions (UNFCCC/PA/CMA, 2023). As such, they play a pivotal role in global climate action. However, while the Paris Agreement emphasizes the necessity of ambitious NDCs, their current structure lacks uniformity and often falls short of the required emission reductions. In response, we propose to adapt NDCs with Sectoral Emission-Path Goals, as we believe that sector-specific targets and strategies, together with more transparency brought by a digital accountability framework, can bridge the ambition gap and facilitate the transition to low-carbon economies.

Adapting NDCs with sectoral emission-path goals offers several advantages that can enhance the effectiveness, transparency, and accountability of climate change mitigation efforts. We highlight the following: Sectoral goals (i) enable countries to identify **cost-effective emission reduction opportunities**, as well as bottlenecks and the need for innovation to diminish emissions in specific sectors; (ii) **enhance transparency and accountability** by visualizing sectoral emission trajectories, thus fostering sector-specific accountability, and providing a framework for monitoring progress and links to international systems of transferable emission credits; (iii) provide clear roadmaps for each sector, **enhancing the effectiveness of emission reduction strategies** by aligning them with sustainable development goals and differentiating between mitigation and development efforts; (iv) enable countries to optimize emission reductions by **tailoring strategies to each sector's unique potential and cost-effectiveness**, such as defining carbon dioxide (CO₂) emissions goals for forestry or specific targets for the energy sector; and (v) **enhance accountability through quantifiable targets**, enabling regular reviews and ensuring sectors are accountable for meeting their objectives, crucial for the success of countries' NDCs.

Adapting NDCs with sectoral emission-path goals requires a holistic approach that integrates sector-specific

considerations into national climate policy frameworks within which we consider the following 6 components key:

1. **Data Collection and Analysis:** Robust data on emissions sources, trends, and potential mitigation measures are essential for setting meaningful Sectoral Emission-Path Goals. Countries need to invest in data collection and analysis capabilities, including the development of emission inventories and modeling tools.
2. **Set specific emission-reduction targets for each sector**, based on the data analysis, aligned with the overall national emission reduction goals. These targets should be ambitious yet realistic, considering the unique characteristics and challenges of each sector.
3. **Develop policies and measures tailored to each sector** to achieve the set emission reduction targets. This may involve a combination of regulatory measures, incentives, investments in clean technologies, and capacity-building initiatives.
4. **Engage stakeholders** from government, industry, civil society, and other relevant sectors in the development and implementation of sectoral emission-path goals. Consultation and collaboration are essential for gaining buy-in, sharing knowledge and expertise, and fostering collective action.
5. **Establish robust monitoring and reporting mechanisms** to track progress towards sectoral goals. This includes regular data collection, analysis of trends, evaluation of policy effectiveness, and transparent reporting to ensure accountability and facilitate learning.
6. **Periodically review and, if necessary, adjust sectoral emission-path goals** based on evolving circumstances, new technologies, and updated scientific understanding. Flexibility and adaptability are key to ensuring that goals remain ambitious and relevant over time.

2.2 Pillar 2: Improving Financing of Innovation needed for Systems Transformation

Recent estimates put the global financing gap for climate change adaptation at US\$ 194-366 billion per year, and the annual adaptation financing-need for developing economies at US\$ 387 billion (UNEP, 2023). Accountability of Parties to agreed financial flows from developed to developing economies is largely lacking. To address these financial shortcomings, we propose: (1) to integrate the Digital Climate Accountability System in the Long-Term Vision on Complementarity, Coherence, and Collaboration between the Green Climate Fund (GCF) and Global Environment Facility (GEF), thereby ensuring that the financial mechanisms of the UNFCCC are aligned with our proposed framework; (2) to increase concessionality and risk taking by multilateral development banks (MDBs) and other development institutions to ensure public finance is not going towards projects that could be fully funded by commercial investors; (3) to promote comprehensive

integration of climate and biodiversity risk in the risk methodologies of MDBs and Credit Rating Agencies to lower the interest rates of developing countries looking to finance green projects; (4) to foster community engagement and empowerment investment criteria for financial actors, so that more resources are channeled to vulnerable communities. This is essential for fostering bottom up initiatives of climate resilience, decentralized renewable energy and other projects that generate social value locally and ensure a participatory governance structure; (5) to record essential data using blockchain-based registries, aimed to improve investors' accountability and transparency.

2.3 Pillar 3: A Digital Accountability Framework

Finally, the third pillar of our proposal is a Digital Climate Accountability System, which we deem crucial to put Parties back on track, as it provides a continuous, global flow-take of progress with emission-reductions and of the financial flows, needed for adaptation and technological innovation. It is a framework that uses advanced technologies to transform climate action. Through a universally accessible digital repository for climate disclosures from state and non-state actors, this system simplifies reporting, improves data analysis, and enhances credibility. Governed by the UNFCCC, it aligns with global climate initiatives and contributes to the existing UNFCCC GCAP (HLEG, 2022). The framework provides detailed information about the key actors, their roles, activities, and how data is created, harmonized and managed (Hsu & Schletz, 2023). The essential procedures are as follows:

- 1. Comprehensive Data Sources:** (i) State and non-state actors input greenhouse gas (GHG) emissions inventories, standardized reports, and country metrics (Hsu & Schletz, 2023). Table 1 presents examples of country metrics; (ii) Satellite imagery and Internet-of-Things (IoT) sensors provide real-time environmental data for verification, maintaining accuracy and reliability (Edmond, 2023; Hsu et al., 2020).
- 2. Harmonized Data Integration:** Standard-setters ensure data harmonization for consistency and comparability (Hsu & Schletz, 2023).
- 3. Artificial Intelligence (AI) Powered Analysis:** The country-specific AI model considers metrics by country, ensuring equity, fairness and accuracy. (i) Large Language Models can understand the context and perform tasks such as translation summarization (Debnath et al., 2023). (ii) AI-algorithms also process satellite imagery to detect changes in land use, deforestation, and urbanization, providing insights into environmental impacts (Jain et al., 2023).
- 4. Benchmarking and Comparisons:** Actual emissions are compared against benchmarks to assess progress.

Table 1: Examples of Country Metrics

Country Metric	Unit
Economic Factors	
GDP	Current international \$
GDP per Capita	Current international \$
Social Factors	
Population size	Number of individuals
Population Density	People/km ²
Urbanization Rate	%
HDI	0-1
Environmental Factors	
Natural Resource Dependence	High,Medium, Low
Equity Metrics	
Gini Coefficient	0-1
Climate Vulnerability Index	High,Medium, Low

Note: authors' elaboration.

5. **Transparency and Reporting:** Real-time data is displayed on the UNFCCC GCAP with country comparisons and progress toward Long-Term Low-Emissions Development (LT-LED) goals. It also highlights anomalies, triggering alerts for countries falling behind.
6. **Independent Data Verifiers:** Watchdog groups, including scientific experts, verify and assess reported data to ensure it aligns with climate objectives, enhancing transparency and accountability (Hsu & Schletz, 2023).
7. **Enforcement and Incentives:** (i) Failure to meet climate targets may result in enforcement mechanisms like Carbon Tax or higher carbon prices (IEA, 2019); (ii) Allocation of extra Special Drawing Rights (SDRs) incentivizes meeting commitments and supports lower-income nations.

Countries need to make progress on technology development, technology transfers, and technology funding, including financial transfers, as outlined in the Paris Agreement and reflected in their NDCs. However, these flows are currently considered inadequate (Transitional Committee, 2023). The large financial-flow shortfalls observed since 2009 up till 2023 would have been exposed if a transparent system had been in place to promote accountability and corrective actions (Stallard, 2022). The Digital Accountability System's transparency aims to fill this gap. It will monitor carbon emissions and technological and financial transfers, from high-tech-high-income to lower-tech-lower-income economies. Compliance is enforced through public data disclosure. This will enforce necessary technology transfers to reduce emissions further. Moreover, it tracks funding and financial transfers across countries to fund new and existing green technologies. In so doing, the system enhances the economic viability of climate change measures by providing a continuous 'Flow-take' of available climate financing opportunities provided by, e.g., the UNFCCC carbon markets, the Green Climate Fund, the IMF's Resilience and Sustainability Trust, among others (IMF, 2022).

The proposed system also provides an instrument to visualize cross-country inequalities, potentially

contributing to their mitigation. It sheds light on the amount and direction of financial flows from higher-income to lower-income countries, addressing cross-country inequalities and showing deficiencies.

3. Implementation

To implement the three pillars, we propose in the **short run**, the following four actions at the **national level**:

1. Conduct a nation-wide appraisal of the emission levels of different types of economic activity and use sectoral averages to establish **Sectoral Decarbonization Task Forces**, responsible for co-designing and implementing Net Zero Transition Pathways and acknowledging the inherent differences across sectors. Subsequently, the Task Force should clearly delineate the mandates, timelines, and least-cost mitigation strategies using sectoral benchmarks derived from the results of the survey and climate science. As example, Parties could drawing on the successful case study of the UK's Sector Deals as part of their Industrial Strategy, which fosters collaboration between the government and industries for innovation and sustainability in key sectors (Government of the UK, 2017).
2. Mobilize companies towards Net Zero Transition Pathways, particularly carbon-intensive industries such as energy, transportation, and agriculture, through the use of **Policy Menus & Incentive Structures provided by Parties**, that are in sync with each country's long-term development needs and political capabilities. As examples, these menus could draw on best practices and lessons from successful case studies, such as the Renewable Energy transition in Denmark (Ministry of Foreign Affairs of Denmark, 2018); Incentives could entail tax rebates and grants for businesses that adopt green technologies or, or subsidies that favor sustainable practices. Norway's use of sovereign wealth funds to invest in renewable energy and sustainable development projects offers an example of political will translated to climate mitigation priorities (Feingold, 2022).
3. **Technology Manufacturing Allocations**: Upon the selection of the appropriate national directive from the Policy Menu, countries can work to decouple adverse environmental impacts from economic and corporate activity through the use of state-of-the-art climate technology. This includes the identification of sector-specific least-cost technological innovations and the introduction of fiscally-responsible taxation structures to further make technologies cost-effective for widespread adoption. For instance, the use of satellite sensing and image processing, predictive weather and hazard forecasting using GeoInt systems running on Machine-learning analytics, and adoption of smart irrigation technologies can improve efficient use of scarce water resources and foster climate adaptation in agriculture-dependent economies.

4. **Leveraging Private Finance**, e.g., by promoting Public-Private-Partnerships to mobilize investments in green technologies. For example, the Renewable Energy Performance Platform (REPP) model has successfully catalyzed renewable energy projects in Africa (Editor, Africa.com, 2023).

At the **regional level**, we propose:

1. **Regional Task Forces** to complement and monitor national task forces. An example is the model of the Regional Greenhouse Gas Initiative (RGGI) in the United States, where states collaborate to cap and reduce CO₂ emissions across borders (RGGI, 2019). Such task forces will be especially valuable in preventing multinational corporations to shirk responsibilities by migrating their operations to a different national jurisdiction. They will also facilitate technology transfers and capacity building within the region. An example is the ASEAN Plan of Action for Energy Cooperation (APAEC), which enhances energy security and sustainability through regional collaboration (APAEC et al., 2016).
2. **Integrated Transboundary Climate and Biodiversity Strategies:** (i) Develop integrated strategies, focusing on shared regional ecosystems. Their formulation can draw inspiration from the Amazon Cooperation Treaty Organization (ACTO, 1978), which promotes sustainable development and conservation practices in the Amazon Basin through region cooperation, as a starting point; (ii) Conduct periodic vulnerability and needs assessments for at-risk populations, flora and fauna, and geographical forms.

At the **international level**, we add:

1. **Kickstart the Digital Climate Accountability Framework:** Initiate the development of a digital platform for transparent reporting and monitoring of emissions and climate action commitments, akin to the Climate Action Tracker, which assesses national climate targets and actions. This platform will integrate real-time data from satellite imagery and Internet-of-Things sensors for accurate monitoring, drawing from the Global Forest Watch Initiative's success in using technology for deforestation tracking.
2. **Find new forms of financing to close the gap, e.g., an Angel Energy Transition Fund**, that utilizes innovative and feasible green capital. Such a fund could play a transformative role in advancing sustainable initiatives with the support of angel investors. It can involve independent auditors to review finances and project performance to ensure the credibility of fund's operations. It can ensure transparency and

accountability through Open Data Platforms that publish financial flows, project outcomes, and impact assessments.

In the **medium to long run**, we propose the following additional actions at the **regional level**:

1. **Implement cross-border green infrastructure projects** such as interconnected renewable energy grids with high-capacity battery storage systems and transnational legislation of must-dispatch rules to ensure seamless, reliable, and cost-effective variable renewable energy generation and integration. This could be modeled, for example, after the EU's transnational energy networks.
2. **Formation of Regional Climate Governance Bodies** to ensure and enable inclusivity, coordination, accountability and contract-bound compliance among countries. Trade relationships between neighboring countries can be leveraged and cross-border conservation agreements can be established to protect shared ecosystems and wildlife corridors.

At the **international level**, we suggest complementing this with:

1. **Expansion and Enhancement of the Digital Accountability Framework**, by including advanced Earth observation satellites, AI-driven analytics for predictive modeling and scenario planning. Use these expansions and enhancements to revise national-level Policy Menus and provide tracking metrics and information to facilitate carbon accounting and transactions and promote international collaboration and consensus building for setting standardized data reporting protocols and verification mechanisms.
2. **Comprehensive Financing Mechanism Overhaul**: Create a pipeline of projects and instruments to mitigate financial risks of green investments by using innovative financial tools and harmonizing international green financing standards to scale up investments in sustainable development.

Lastly, we foresee the following **risks** and propose **mitigants**:

1. **Industries with high carbon footprints may resist transformation** and capture the political institutions of countries where they operate due to perceived threat to profitability and operational continuity. **Mitigant**: Offer transitional support, including financial incentives and technical assistance, to expedite the shift towards sustainable practices. A phased approach could alleviate political challenges.

2. **Political risk:** changes in elected administrations can lead to policy reversals, ebbs and flows in political will, and regulatory uncertainties, impacting long-term planning. **Mitigant:** Strengthen legal frameworks to ensure policy continuity beyond political cycles. Foster bipartisan support for climate initiatives to ensure they are insulated from political changes.
3. **Technological Feasibility and Adoption:** The assumed technological advancements, particularly in carbon capture and renewable energy storage, may not progress as anticipated, hindering decarbonization targets. **Mitigant:** Prioritize investment in R&D and pilot projects to test and improve technologies before full-scale implementation. Diversify technology portfolios and enhance market competition to avoid overreliance on specific solutions and complacency among vendors.
4. **Financing and Investment Risks:** The required scale of investment might not be met due to perceived risk by investors, especially in developing regions or for untested, innovative technologies. **Mitigant:** Use blended finance structures and national, regional, and international credit guarantee systems to de-risk investments, combining public funds with private capital. Insurance products would also need to develop to cover specific risks such as force majeure risks in climate change-induced extreme weather events.
5. **Data Compliance Risks in Digital Accountability Framework:** The collection and sharing of data for monitoring and reporting purposes could raise concerns about compliance from national authorities and confidentiality of sensitive data. **Mitigant:** Implement robust data protection regulations and encryption technologies while still fostering transparency and accountability through the use of blockchain technology, enabling stakeholders to control their data.
6. **Equity and Inclusivity Concerns:** Policies and measures may risk disproportionately impacting or bearing unforeseen adverse consequences for already vulnerable populations, exacerbating social and economic inequities. **Mitigant:** Integrate social impact assessments in the planning and implementation phases. Design policies that include social safeguards and compensation mechanisms for adversely affected groups.

References

- Amazon Cooperation Treaty, (1978). <https://otca.org/en/wp-content/uploads/2021/01/Amazon-Cooperation-Treaty.pdf>
- APAEC Drafting Committee, ASEAN Centre for Energy, AN Centre for Energy, ASEAN Secretariat, & ASEAN Specialised Energy Bodies and Sub-sector Networks. (2016). ASEAN plan of action for energy cooperation (APAEC) 2016-2025; Phase II: 2021-2025. In ASEAN. ASEAN Centre for Energy (ACE). <https://asean.org/wp-content/uploads/2023/04/ASEAN-Plan-of-Action-for-Energy-Cooperation-APAEC-2016-2025-Phase-II-2021-2025.pdf>
- Debnath, R., Creutzig, F., Sovacool, B. K., & Shuckburgh, E. (2023). Harnessing Human and Machine Intelligence for Planetary-level climate action. *Npj Climate Action*, 2(1). <https://doi.org/10.1038/s44168-023-00056-3>
- Editor. (2023, September 15). Public-Private Partnerships for Africa's Energy Transition. [Www.africa.com. https://www.africa.com/developing-public-private-partnerships-ppps-for-africas-energy-transition/](https://www.africa.com/developing-public-private-partnerships-ppps-for-africas-energy-transition/)
- Edmond, C. (2023). *Satellite tracking is helping scientists pinpoint the worst emissions offenders*. World Economic Forum. <https://www.weforum.org/agenda/2023/02/climate-emissions-satellite-tracking/>
- Feingold, S. (2022, September 23). Norway's \$1.2 trillion wealth fund sets net-zero target. World Economic Forum. <https://www.weforum.org/agenda/2022/09/norways-massive-sovereign-wealth-fund-sets-net-zero-goal/>
- Government of the UK. (2017, November 27). Introduction to Sector Deals. GOV.UK. <https://www.gov.uk/government/publications/industrial-strategy-sector-deals/introduction-to-sector-deals>
- HLEG - High Level Expert Group. (2022). *Integrity matters: Net zero commitments by businesses, financial institutions, cities and regions*. UN. https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf
- Hsu, A., & Schletz, M. (2023). *Envisioning the Future of Non-State Climate Action Data and Accountability*. Data-driven EnviroLab. https://datadrivenlab.org/wp-content/uploads/2023/11/Future_of_NSA_Data_Accountability_Nov2023.pdf
- Hsu, A., Khoo, W., Goyal, N., & Wainstein, M. (2020). Next-generation digital ecosystem for climate data mining and knowledge discovery: A review of Digital Data Collection Technologies. *Frontiers in Big Data*, 3. <https://doi.org/10.3389/fdata.2020.00029>

- IEA. (2019). *Carbon tax act (act no. 15/2019) – policies*. <https://www.iea.org/policies/3041-carbon-tax-act-act-no-152019>
- IEA. (2023). Stronger international cooperation in high emissions sectors crucial to get on track for 1.5 °C climate goal. <https://www.iea.org/news/stronger-international-cooperation-in-high-emissions-sectors-crucial-to-get-on-track-for-1-5-c-climate-goal>
- IMF (2022). Scaling up private climate finance in emerging market and developing economies: challenges and opportunities, in: IMF (2023). *Global Finance Stability Report: Navigating the high-inflation environment*. IMF: Washington DC
- Jain, H., Dhupper, R., Shrivastava, A., Kumar, D., & Kumari, M. (2023). AI-enabled strategies for climate change adaptation: Protecting communities, infrastructure, and businesses from the impacts of climate change. *Computational Urban Science*, 3(1). <https://doi.org/10.1007/s43762-023-00100-2>
- Ministry of Foreign Affairs of Denmark. (2018). *Pioneers in Clean Energy*. Denmark.dk. <https://denmark.dk/innovation-and-design/clean-energy>
- RGGI, Inc. (2019, July 9). *Welcome | RGGI, Inc.* Rggi.org. <https://www.rggi.org/>
- Science Based Targets Initiative (2015). Sectoral decarbonization approach (SDA): A method for setting corporate emission reduction targets in line with climate science. CDP, WRI & WWF. <https://sciencebasedtargets.org/resources/files/Sectoral-Decarbonization-Approach-Report.pdf>
- Stallard, E. (2022, November 20). *What is loss and damage and Will Rich Nations pay for climate change?*. BBC News. <https://www.bbc.com/news/science-environment-63478446>
- UN (n.d.). COP 28: What was achieved and what happens next? <https://unfccc.int/cop28/5-key-takeaways#end-of-fossil-fuels>.
- UNEP - United Nations Environment Programme (2023). *Adaptation Gap Report 2023: Underfinanced. Underprepared. Inadequate investment and planning on climate adaptation leaves world exposed*. Nairobi. <https://doi.org/10.59117/20.500.11822/43796>
- UNFCCC (2023). *Outcome of the first global stocktake. draft decision -/CMA. ...* UNFCCC.int. https://unfccc.int/sites/default/files/resource/cma2023_L17_adv.pdf
- UNFCCC/PA/CMA (2023). *Nationally determined contributions under the Paris Agreement*. https://unfccc.int/sites/default/files/resource/cma2023_12.pdf
- WMO - World Meteorological Organization. (2024). *WMO confirms that 2023 smashes global temperature record*. <https://wmo.int/media/news/world-had-warmest-january-record#:~:text=WMO%20has%20already%20confirmed%20that,and%20a%20warming%20EI%20Ni%20C3%B1o.&text=January%202024%203A%20A%20Month%20of,dramatic%20signs%20of%20climate%20change>