

# CLIMATE FINANCE IN INDIA

PAPER 2

## CLIMATE FINANCE FLOWS TO DEVELOPING COUNTRIES UNTAPPED OPPORTUNITIES

TAMIKSHA SINGH



## ABOUT THIS PAPER SERIES

While there have been strides made in climate finance mobilisation and deployment, there are still several gaps and the quantum mobilised till date lags behind the requirements. In the face of the climate emergency, there is a need to immediately mobilise large amounts of climate finance, from across all sources, for developing countries. This collection of papers explores areas and approaches for facilitating the required finance mobilisation in India. Building on existing research and assessments, the papers in this report dive deep in the following four themes:

- The State of Climate Finance: Understanding Past and Future Trends
- Climate Finance Flows to Developing Countries: Untapped Opportunities
- Climate Finance in India
- Catalysing Private Climate Finance Readiness for Mainstreaming Article 9 at the Subnational Level: Context of India

## ABOUT THE COUNCIL FOR STRATEGIC AND DEFENSE RESEARCH

The Council for Strategic and Defense Research is a New Delhi based think-tank that combines rigorous academic research with policy advocacy and strategic consultancy. Based out of New Delhi — a key national capital in the emerging geopolitics of South Asia and Indo-Pacific — allows CSDR to understand and help shape the ever-changing geopolitical panorama of the region. CSDR works on issues such as foreign policy, regional connectivity, defense strategy, intelligence, strategic technologies, conflict resolution, peacebuilding, climate change and energy security. CSDR's multidisciplinary network of research professionals and senior policy practitioners fuses incisive research with experiential knowledge to produce timely and independent analysis, policy relevant knowledge, and curate multi-stakeholder dialogue platforms, for governments, businesses, research endowments and other associated institutions.

---

© 2022 COUNCIL FOR STRATEGIC AND DEFENSE RESEARCH

3, PRATAP SINGH BUILDING  
JANPATH LANE, NEW DELHI  
INDIA - 110001

PHONE: 011-43104566  
EMAIL: [OFFICE@CSDRONLINE.ORG](mailto:OFFICE@CSDRONLINE.ORG)  
WEB: [WWW.CSDRONLINE.ORG](http://WWW.CSDRONLINE.ORG)  
TWITTER: [@CSDR\\_INDIA](https://twitter.com/CSDR_INDIA)

## EXECUTIVE SUMMARY

While there have been strides made in climate finance mobilisation and deployment, there are still several gaps and the quantum mobilised till date lags behind the requirements. In the face of the climate emergency, there is a need to immediately mobilise large amounts of climate finance, from across all sources, for developing countries. Public finance can play a critical role in facilitating this, and the present commentary explores areas and approaches for facilitating the required finance mobilisation. Building on existing research and assessments, the commentary paper posits three broad categories of public finance needed for specific sectors, based on the maturity of the technology and business models. These are:

- Readiness finance for demonstrating viability and exploring novel solutions;
- Risk mitigation finance for market development; and,
- Investment finance for commercialisation and mainstreaming of mature climate solutions. The type of finance to be leveraged is contextual, depending on the sector and country, but there are learnings from past and ongoing successes in specific geographies and areas, such as renewable energy in emerging economies.

## ABOUT THE AUTHOR

Tamiksha Singh is currently affiliated to WRI India's Climate Resilience Practice. She focuses her research on issues pertaining to climate finance, climate policies, carbon markets, and international climate negotiations. She has 10 years of experience working at the national and sub-national level, and with research organisations, financial institutions and consultancies in India. Tamiksha obtained her MSc in Sustainable Development from HEC Paris, MBA with a specialisation in finance from the Institute of Management Nirma University, Ahmedabad and a BA with Economic Honours from Panjab University, Chandigarh.

## INTRODUCTION

Under the Paris Agreement, climate finance is understood as finance assistance provided to developing countries from developed countries for climate objectives, implicitly focusing on public finance. In recent years, this understanding has started to shift to encompass private finance, commonly termed as climate investments, and finance mobilised by developing countries for their climate goals. A reason for this change in understanding is the growing finance needs and the continual failure of developed countries to fulfil their commitments. While this shift is debatable from the climate justice perspective, there is an unarguable need to mobilise climate finance and investments from all sources.

According to Climate Policy Initiative (CPI), the total tracked climate finance was estimated to have reached USD 632 billion in 2019/2020, steadily increasing over the last decade, with a ~36% increase since the Paris Agreement. However, according to their assessment, to meet current climate objectives, total climate finance needs to be over USD 4 trillion by 2030, indicating a massive six-fold increase required under a decade (CPI, 2021). This climate finance gap and the urgent need to fill it has been recognised and documented by several studies over the last decade (Buchner et al, 2019).

It should be noted there has been a steady increase in public finance. Private finance has been increasing, too, and in fact, out-stripping public finance, albeit a large proportion of this is concentrated towards renewable energy projects and is in the form of market-rate debts (CPI, 2021; Buchner et al, 2019). However, the climate finance gap is increasing at a much larger rate, as climate impacts intensify in the face of insufficient action. Studies propound the ever increasing, urgent role of private finance in filling this gap and enabling the required transition to low-carbon and climate resilient development and growth pathways; going further to highlight the critical role of public finance to create enabling conditions for unlocking private climate finance (Buchner et al, 2019; Thwaites, 2020).

Mobilising private climate finance investments is often seen as the key viable solution to fill this gap (Clark et al., 2018). However, several studies have identified the barriers to mobilising private finance; the challenge is that beyond a few sectors and well-established technologies—such as renewable energy, energy efficiency and electric vehicles—there are very few areas where private investors are willing to invest for returns (Bhandary et al., 2021; Clark et al., 2018). The efforts of multilateral development banks (MDBs), under their 'Billions to Trillion' agenda, has also not yielded the desired results (Thwaites, 2020; Attridge, 2019).

This challenge is much more pronounced in developing countries, with limited resources to divert from existing development programmes, and often have under-developed capital markets and private sector. Further exacerbating the issue is that developing countries need climate finance most for climate adaptation purposes, a sector where the private sector, in general, has not yet perceived or captured the business case.

Developmental finance allocation is traditionally based on an assessment of efficiency and equity considerations. This paper posits that international climate finance to developing

countries, including public multilateral and bilateral finance, as well as philanthropic funds, needs to be directed towards critical leverage points for de-risking climate projects, which can maximise impact and have a multiplier effect on mobilising the required private climate finance and domestic climate investments from developing countries.

## WHERE IS CLIMATE FINANCE NEEDED FOR DEVELOPING COUNTRIES?

While designing measures to address the challenges for mobilising private finance for climate, it is important to recognise that climate investments and conventional investments are inter-linked. The ability to mobilise climate investments depends on the attractiveness of climate mitigation or adaptation projects in comparison to competing conventional investment opportunities. Thus, to make climate investments more attractive, there is a need to improve the risk-return profile of projects, address prevailing investor preferences and behaviour, and market failures in the near-term, due to the urgent need of these solutions, before they are able to achieve market competitiveness (Fankhauser et al., 2015; Bhandary et al., 2021).

Besides the quantum of finance that needs to be raised, another equally critical challenge is the access to finance, especially for investors from developing countries. It should be noted here, that some high-investment sectors in developing countries, such as renewable energy, are relatively better at raising funds through various financing channels, including green bonds and market loans (Fankhauser et al., 2015). So, the financing stage of a climate solution or project is also dependant on the sectoral and country context.

The aim of the paper is to highlight the approaches and instruments that international public finance can leverage in the immediate and short run, to accelerate the mobilisation of the required climate finance, by providing appropriate risk mitigation for implementing novel technologies, and grant or concessional funding for establishing the feasibility of climate adaptation models. Taking an approach which assesses the maturity of a climate technology or business model, the figure below explores the type of finance and support required from public finance sources.

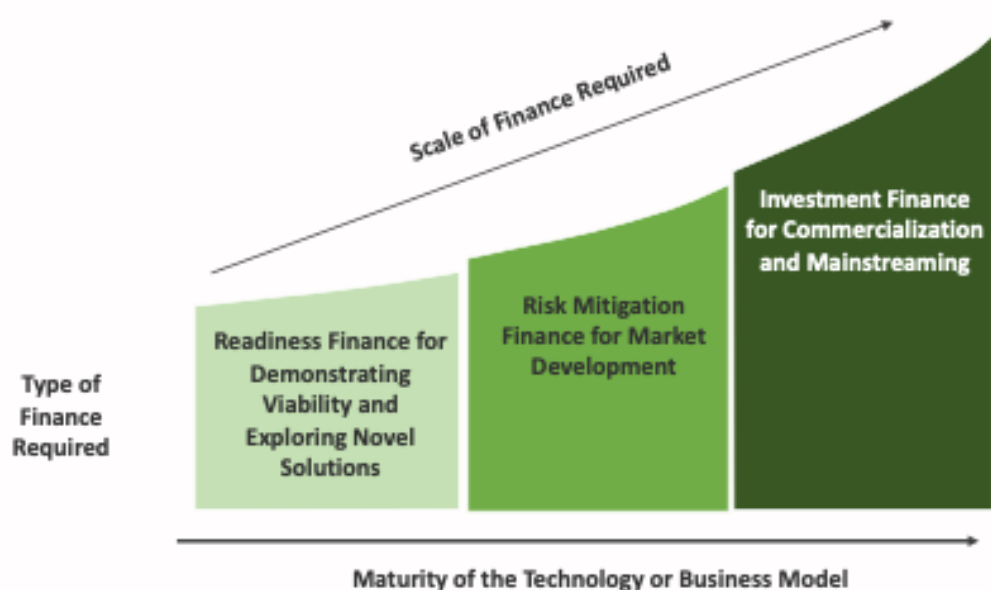


Figure 1: Type and scale of finance required in different stages of maturity of a climate technology or business model

- Readiness finance for demonstrating viability and exploring novel solutions

Readiness finance is a proven developmental finance mechanism that has also been used across various sectors for sustainable development and climate change. Private climate finance flows for climate action in developing countries need catalysts to overcome barriers. Readiness finance, in the form of grants and concessional loans, along with technical support for project development and delivery, is needed at the nascent stages of transition to explore and evaluate the viability and effectiveness of different solutions and models for achieving the specific objectives (Attridge, 2019).

In the last decade, climate solutions and projects faced a set of barriers to reach a viable level for conventional investments. These included unproven technologies and business models, with disaggregated and small project sizes, which resulted in high-risk perception, high transaction costs and limited market liquidity. To address these challenges, multilateral banks and bilateral funders developed their investment readiness frameworks (for example, the World Bank, ADB, USAID and GIZ) for a range of climate objectives. The projects under these frameworks emphasised on measures for initiating governance reforms, building technical capacity so as to develop a climate investment-friendly policy environment, developing indicators and aligning monitoring, and verification processes with international protocols (Agbemabiese et al, 2018). At this stage, international climate finance grants are needed for pilot and demonstration projects, and may even include concessional finance for the public sector to mobilise domestic public finance, depending on the country's context (Ryan et al., 2012).

Such frameworks (like the UNDP framework for investment readiness) is more of a top-down approach that emphasises on low-carbon development to be embedded in the national policy framework and emphasises on capacity building and other measures (Agbemabiese et al, 2018). This has resulted in policy drivers—such as tax incentives, subsidies and regulations—being framed to incentivise climate projects. These frameworks can be perceived to be successful in the mitigation space for renewable energy in the early decade of the century, and then for energy efficiency. However, these frameworks are now needed across sectors and regions to facilitate the uptake of new technologies and for climate adaptation by mobilising investments.

According to the CPI assessment, less than 10% of total climate finance flows was directed towards climate adaptation, with the sector experiencing an increasing finance gap (CPI, 2021). To add to this, the latest warnings as per the IPCC report, which stresses the need for climate adaptation and resilience-building measures in the face of its mounting costs, also indicates the growing role of the private sector to facilitate and fill the gap for undertaking these measures. However, the drivers for private investment are missing, since the business case and need for adaptation is not yet clearly perceived by the private sector, and the climate risks to their business operations not yet properly evaluated and understood. This is a key leverage point that needs to be addressed with the help of public climate finance and policy environment. The international climate finance sector is required to play a critical role in facilitating this evaluation.

For instance, in the case of adaptation, due to the nature of the required interventions, the approach for readiness building needs to be more bottom-up, focusing on establishing the economic case for investments at the local level and involving intense stakeholder engagement and capacity building. With the help of international public finance support, there is a need to explore the effectiveness of novel financing mechanisms in developing countries, such as payment for ecosystem services or blue carbon finance.

As global climate action gathers momentum, a challenge for readiness finance is that there is a vast range of activities and sectors, across most geographies, that could be assessed for such funding. However, there is a need to prioritise and target over-arching systems to have maximum impact for the limited public finance available. An area where readiness finance could have a cross-sectoral and multiplier impact across most developing countries is establishing the Paris Agreement's Article 6 mechanisms and for developing carbon markets or finance mechanisms. With increasing complexity of the rules and modalities of Article 6 over the last few years, developing country Parties to the Paris Agreement have often stated the need for capacity building support to enable them to participate in the upcoming mechanisms in an equitable manner. A critique of the Clean Development Mechanism was that it was unable to garner participation from most developing countries and was largely confined to emerging economies. The aim is to not repeat that mistake under the Paris Agreement. At the national level, Article 6 requires establishing of processes and infrastructure comprising of national registries, monitoring and tracking mechanisms, institutional frameworks, etc. Public climate finance from international funders will be needed to support these initiatives so that they are robust and well-aligned with international standards. Going forward, carbon markets at the national or regional level will also be required to enable a wider range of developing countries to participate and benefit. Considering the complexity of establishing these processes, public climate finance can provide readiness finance for a few specific sectors, with linkages to other existing carbon markets for the required scale.

- Risk mitigation finance for market development

Upfront costs are generally a major barrier to adoption of new clean technologies and sustainable development business models. As seen, in several cases, national policies and programmes have been framed to target this issue and help minimise these costs to projects, so that the technologies can become viable for uptake and investments by industries and consumers. This has been most evident in the renewable energy and energy efficiency sectors over the last decade. Left to the market forces, it is highly unlikely that the market will be able to quickly transform and adequately address the issues of high upfront costs and market failures, which lead to a "price-hump". To kick-start this process and specifically address the additional price differential at the initial stages of deploying clean technologies and models, public finance has usually utilised policy measures along with the instruments of grants and concessional loans (Singh1, 2018).

A successful policy instrument used for renewable energy is feed-in-tariffs (FiT), which was able to mobilise finance from institutional investors across the world and ultimately lead the sector to commercialisation stage. Since investors are familiar with its functioning, it could

be used in a modified form for other immature technologies too, even though it faces certain criticisms like its impact on limiting competition and artificially keeping prices high (Bhandary et al., 2021). The Indian model of the UJALA programme for increasing market penetration of energy-efficient LED bulbs, led by the public sector Energy Efficiency Services Ltd. (EESL), is another successful example. A demand aggregation and bulk procurement approach helped develop the LED bulb market by providing comfort to the manufacturers and suppliers of LED, enabling them to ramp up their production to meet this demand, which led to price correction and standardisation of the technology, further resulting in a massive increase in demand. It should be noted, that EESL received enabling finance in the form of grants and concessional loans from several public finance sources, including the Indian government and the World Bank (Singh et al.2, 2018).

Climate finance in the form of international loans and grants, which has overall been the major finance instruments used till date, might not be the most effective means of enabling quick and transformative adoption of new technological solutions across a range of sectors (Fankhauser et al., 2015). To move towards developing a viable market for these solutions, with full participation from the private sector, public finance support for instruments and mechanisms such as risk guarantees, first-loss guarantees, subordinate debts, public-private partnerships and aggregation vehicles may be more effective for technological solutions (Bhandary et al., 2021; Ryan et al., 2012).

Financial mechanisms for climate objectives, such as credit risk enhancements and partial loan guarantees, need to be further explored to mainstream climate objectives in conventional finance products. They have been leveraged to an extent through policy measures in India. One example is SIDBI's Partial Risk Sharing Facility for Energy Efficiency, which was initiated with financial support from the Global Environment Facility and the Clean Technology Fund, and seeks to incentivise investments in energy efficiency projects for micro, small and medium enterprises (MSMEs) by energy service companies (SIDBI website). There is potential for exploring this for other new technologies and innovative business models requiring aggregation, such as leasing of electric buses by cities and sub-national actors, or low-carbon cooling solutions, and agricultural warehousing and cold-chains.

Specific barriers to leveraging international climate investments can be addressed by modifying existing financial mechanisms through public guarantees. For instance, high foreign currency exchange (FOREX) risk makes international private finance, which usually is available at a much lower rate, costly and unviable for developing countries. Public climate finance support targeted at mitigating FOREX risks, through guarantees, could have a significant impact on improving the viability of international loans for climate projects in developing countries and also improve the availability of such investments by providing a level of comfort to investors. This would be beneficial for encouraging the uptake of novel technologies and models, such as green hydrogen and circular economy processes, which face challenges in raising finance from commercial sources in developing countries. Examples of such models already exist. For instance, the Currency Exchange Fund (TCX), an initiative incubated and launched by the Climate Finance Lab in 2015, with bilateral funding support from the Dutch and German governments, and collaborates with the International Finance Corporation (TCX website).



Such finance can be further enhanced through blended finance vehicles with financial and technical support from public climate finance, which would help build capacities and mobilise private finance in developing countries. Such an approach could also include a public-private partnership modality to provide further comfort to investors. This too has a history of being used for renewable energy projects, and can now be replicated to help other sectors transition towards low-carbon pathways, especially in areas where the public sector has been the dominant actor in developing countries, such as public transport and infrastructure.

Besides these, policy-makers should continue to utilise the common tools of regulations, awareness building, and financial and tax incentives, to facilitate the transition to low-carbon technologies (Singh1, 2018). Once the policy framework and viable models are in place, it has been noted in the case of energy efficiency and renewable energy sectors, that financing from international climate finance sources like multilateral development banks, is far out-stripped by investment from domestic sources, especially for emerging economies including India, China, Mexico and South Africa. However, this isn't always the case for lower income countries where public budgets are constrained and ear-marked for basic developmental needs and capital markets aren't developed enough to support private sector investments (Ryan et al., 2012). These countries require enabling finance for a longer period, to make clean technology solutions the norm, through a judicious mix of grants, technical assistance, and concessional loans.

- Investment finance for commercialisation and mainstreaming of mature climate solutions

A successful example of where public finance measures has been able to mobilise commercial finance and private sector investments is the renewable energy sector. The renewable energy sector's growth in emerging economies was initially financed by concessional loans from MDBs and certain national policy levers. But once these projects were able to demonstrate viability, commercial finance crowded in, and public concessional finance started to step out of the sector. For instance, in India, MDB financing for solar energy declined from 10 percent in 2016 to 2 percent in 2017 (Dutt et al., 2019).

Public finance has also supported the sector in utilising high potential instruments, such as green bonds. Once again taking the example of India, renewable energy developers have raised over USD 11 billion through 21 green bonds from international markets from 2014 till 2021. To put this in perspective, this is nearly triple of the State Bank of India's, India's largest bank, RE portfolio which amounted to loans worth USD 4.3 billion till March 2021 (Garg et al., 2021). In the early years, some of these bonds had direct investments from international public funders, such as IFC and the FMO (Dutch development finance institution). ReNew Power's first green bond was partially guaranteed jointly by the Asian Development Bank (ADB), helping to raise its credit rating to AA+ and making the issue attractive to investors (Agarwal et al., 2018). This indicates how public climate finance supported the establishment of Indian green bonds for the renewable energy sector in international markets, and built the capacity of bond issuers and facilitators.

Similar support measures by public climate finance can be used for mainstreaming and garnering institutional investor support for other mature technologies and low-carbon solutions, such as electric vehicles, green buildings, and energy efficient industrial solutions. While in some countries, these solutions are already nearing full commercialisation, in most developing countries they are not meeting their potential.

At this stage, additional issues such as "directionality" of finance flows and the sub-sectors and technologies being financed may also become important to explore, as currently being done for the renewable energy sector, to understand how to further propel innovations and balanced systems (Mazzucato et al., 2018).

## CONCLUSION

While the ultimate goal is for climate risk to be mainstreamed in commercial finance decisions, and climate technologies and models being able to access investments based on their business case, we are still far from the stage where private climate finance can facilitate all of this. In the face of the urgency to scale global climate interventions, and ensure that developing countries move to low-carbon development pathways, public climate finance plays a critical role in directing this transition. The different technologies and models are in different stages of development which also varies across developing countries. To address this variability and maintain transition momentum, public sector climate funders need to take a contextual approach, identifying critical leverage points to direct their funding across sectors and geographies. On the positive side, there are now several examples of measures that have been effective from mature climate sectors, such as renewable energy, energy efficiency, and electric vehicles. Suitable modification and replication of these measures to newer technologies is now required, and this paper attempts to highlight such areas.

## REFERENCES

Agarwal, Swati and Singh, Tamiksha. "Unlocking the green bond potential in India." The Energy and Resources Institute, 2018, <https://www.teriin.org/projects/nfa/files/Green-Bond-Working-Paper.pdf>

Agbemabiese, Lawrence, et. al. "Enhancing Climate Finance Readiness: A Review of Selected Investment Frameworks as Tools of Multilevel Governance." University of Delaware, Center for Energy & Environmental Policy, Working Paper Series, 2018, <http://dx.doi.org/10.2139/ssrn.3082542>

Attridge, Samantha and Engen, Lars. "Blended finance in the poorest countries: The need for a better approach". ODI Report, Overseas Development Institute, London, 2019, <https://odi.org/en/publications/blended-finance-in-the-poorest-countries-the-need-for-a-better-approach/>

Bhandary, Rishikesh Ram, et. al. "Climate finance policy in practice: a review of the evidence." *Climate Policy*, vol. 21, no. 4, 2021, pp. 529-545. <https://doi.org/10.1080/14693062.2020.1871313>

Buchner, Barbara, et. al. "Global landscape of climate finance 2019." *Climate Policy Initiative*, 2019, <https://www.climatepolicyinitiative.org/wp-content/uploads/2019/11/2019-Global-Landscape-of-Climate-Finance.pdf>

Clark, Robyn, et. al. "Bridging funding gaps for climate and sustainable development: Pitfalls, progress and potential of private finance." *Land Use Policy* vol. 71, 2018, pp. 335-346. <https://doi.org/10.1016/j.landusepol.2017.12.013>

Buchnerm Barbara, et. al. "Preview: Global Landscape of Climate Finance 2021", *Climate Policy Initiative*, 2021. <https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2021/>

Dutt, Arjun, et. al. "Financing India's Energy Transition: A Guide on Green Bonds for Renewable Energy and Electric Transport". Council on Energy, Environment and Water, 2019, <https://www.ceew.in/sites/default/files/CEEW-Financing-India-Energy-Transition-A-Guide-on-Greenbonds-17Jun19.pdf>

Fankhauser, Sam, et. al. "Where are the gaps in climate finance?". *Climate and Development* vol. 8, no. 3, 2016, pp. 203-206, Available at: <https://doi.org/10.1080/17565529.2015.1064811>

Garg, Shreyas, et. al. "Financing India's Energy Transition Through International Bond Markets". Council on Energy, Environment and Water, 2021, <https://cef.ceew.in/solutions-factory/publications/financing-india-energy-transition-through-international-bond-markets#:~:text=Key%20highlights,any%20previous%2012%2Dmonth%20period.>

## REFERENCES

Mazzucato, Mariana, and Gregor, Semieniuk. "Financing renewable energy: Who is financing what and why it matters." *Technological Forecasting and Social Change* 127, 2018, pp. 8-22. <https://doi.org/10.1016/j.techfore.2017.05.021>

Ryan, Lisa B, et. al. "Plugging the energy efficiency gap with climate finance." OECD/IEA, 2012, [https://www.researchgate.net/publication/257002639\\_Plugging\\_the\\_Energy\\_Efficiency\\_Gap\\_with\\_Climate\\_Finance\\_The\\_role\\_of\\_International\\_Financial\\_Institutions\\_IFIs\\_and\\_the\\_Green\\_Climate\\_Fund\\_to\\_realise\\_the\\_potential\\_of\\_energy\\_efficiency\\_in\\_developing\\_cou](https://www.researchgate.net/publication/257002639_Plugging_the_Energy_Efficiency_Gap_with_Climate_Finance_The_role_of_International_Financial_Institutions_IFIs_and_the_Green_Climate_Fund_to_realise_the_potential_of_energy_efficiency_in_developing_cou)

SIDBI. PRSF Project website. <https://sidbi.in/en/prsf-project>

Singh, Manjeet. "Overcoming the price hump: Financing energy efficiency." New Delhi: The Energy and Resources Institute, 2018, <https://www.teriin.org/blog/overcoming-price-hump-financing-energy-efficiency>

Singh, Tamiksha, et. al. "Market-making for low-carbon energy technologies: The UJALA scheme in India." NDC Partnership, Good Practice Database, 2018, <https://www.ndc-cluster.net/good-practices>

TCX Fund, <https://www.tcxfund.com/>

Thwaites, Joe. "The Good, the Bad and the Urgent: MDB Climate Finance in 2019." WRI, 2020, <https://www.wri.org/insights/good-bad-and-urgent-mdb-climate-finance-2019>

UNFCCC. "Climate Investment Readiness Index (CIRI): A Tool to Assess Investment Climate for Climate Investments"

[https://unfccc.int/ttclear/misc\\_/StaticFiles/gnwoerk\\_static/TEM\\_tec\\_cfi\\_ee/7843d4ba5e5e459c99deb4e47b972e83/2dedf130f70a4745adde89ae2bbf7a86.pdf](https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM_tec_cfi_ee/7843d4ba5e5e459c99deb4e47b972e83/2dedf130f70a4745adde89ae2bbf7a86.pdf)

Warren, Peter. "Blind spots in climate finance for innovation." *Advances in climate change research*, vol. 11, no. 1, 2020, pp. 60-64, <https://doi.org/10.1016/j.accre.2020.05.001>

© 2022 COUNCIL FOR STRATEGIC AND DEFENSE RESEARCH

3, PRATAP SINGH BUILDING  
JANPATH LANE, NEW DELHI  
INDIA - 110001

PHONE: 011-43104566  
EMAIL: [OFFICE@CSDRONLINE.ORG](mailto:OFFICE@CSDRONLINE.ORG)  
WEB: [WWW.CSDRONLINE.ORG](http://WWW.CSDRONLINE.ORG)  
TWITTER: [@CSDR\\_INDIA](https://twitter.com/CSDR_INDIA)



COUNCIL FOR  
STRATEGIC AND  
DEFENSE RESEARCH