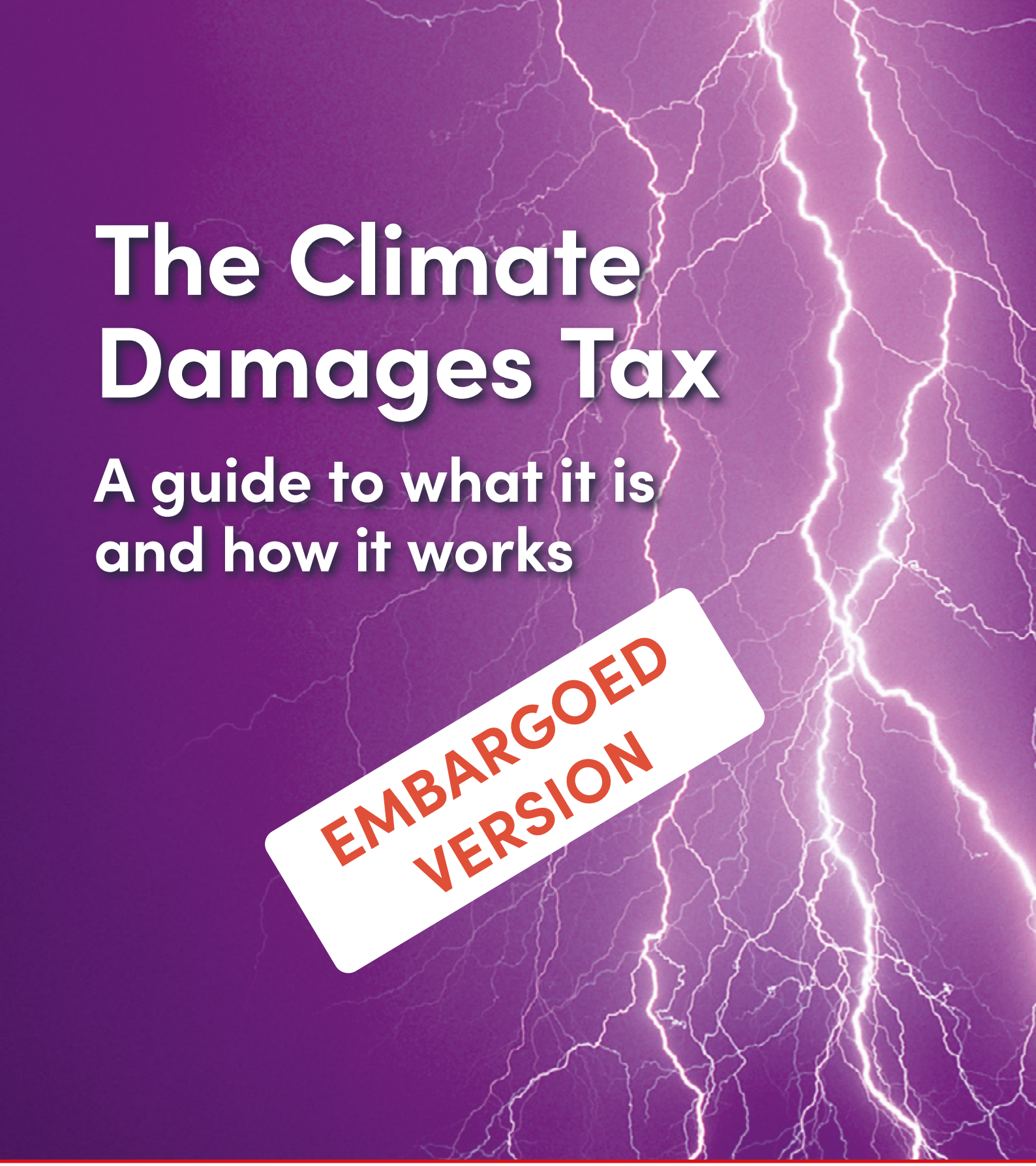

The Climate Damages Tax

A guide to what it is and how it works

EMBARGOED VERSION

GREENPEACE

christian aid

HEINRICH BÖLL STIFTUNG
WASHINGTON, DC

STAMP OUT Poverty

Practical ACTION

Changing the world with women and girls
actionaid

CAN
CLIMATE ACTION NETWORK

Authors

Dr. Sindra Sharma is an expert in climate policy and international development, with a multidisciplinary academic and professional background. Holding a PhD from the London School of Economics and advanced degrees from the University of Auckland, New Zealand, her career demonstrates a strong commitment to climate justice, sustainable development, and the rights of vulnerable communities, especially in Small Island Developing States (SIDS). Currently, as an Independent Consultant & Senior Policy Advisor for Pacific Island Climate Action Network (CAN), Dr. Sharma provides strategic guidance on climate policy, including addressing both economic and non-economic Loss and Damage, and advocating for fossil fuel phase-out strategies in the Pacific region and beyond. She also offers strategic research and technical support to negotiators from Small Island States. Her previous work includes: Advisor to the Presidency Chief Negotiator at the 23rd Climate Conference (COP23); Global Policy Lead at CAN International; and Policy Advisor at E3G.

David Hillman developed his research, advocacy and campaigning skills in the campaign to ban landmines and the campaign to Drop the Debt. As campaign coordinator of Landmine Action (1996–2000) he worked to achieve legislation to ban the manufacture, transfer, sale and military use of landmines, representing the organisation for the presentation of the Nobel Peace Prize in 1998. As Director of Stamp Out Poverty, he has worked for a number of years on new sources of finance for climate and development, helping to create the Robin Hood Tax (RHT) campaign for greater taxation of the financial sector. In 2012, France implemented the Financial Transactions Tax, followed by Italy in 2013 and, most recently, Spain at the start of 2021, raising between them many billions of Euros. Since 2018, his focus has turned to the fossil fuel sector, proposing far greater taxation on their activities, particularly extraction, to generate substantial revenues to help pay for the escalating costs of climate impacts being borne by vulnerable communities and countries. At the same, by increasing the cost of production, to incentivise a shift to renewables.

Stamp Out Poverty

Stamp Out Poverty was founded in 2006 to campaign for new and additional sources of finance to fight poverty and climate change at home and abroad, helping to create the political space for initiatives such as UNITAID, which has to date generated several billion dollars for HIV/AIDS, TB and malaria treatments, with more than half the revenue raised from aviation levies. Stamp Out Poverty led work internationally for the Financial Transactions Tax, creating the very popular Robin Hood Tax campaign that spread across the world in the aftermath of the financial crisis. In 2018, work pivoted to the climate emergency, most particularly to the issue of loss and damage. To build this campaign, Stamp Out Poverty established the Make Polluters Pay coalition in 2021, working with international partners to win agreement for the setting up of a Loss and Damage Fund at COP27.

Acknowledgements

The Climate Damages Tax proposal builds on formative work by Rick Heede to expose the responsibility for climate change of the big oil, coal and gas entities - the Carbon Majors. Thanks to Illari Aragon, Mark Barrell, Tracy Carty, Nushrat Chowdhury, Gyorgy Dallos, Zahra Hdidou, Ziad Issa, Julien Jreissati, Charlie Kronick, Colin McQuistan, Tata Mustasya, Peter Newell, Rebecca Newsom, Alice Osborne, Mariana Paoli, Oliver Pearce, Elena Polisano, Sophie Rigg, Liane Schalatek, Martin Zavan for providing inputs to this paper. Special thanks to ActionAid UK and CBM UK for providing the Women & Girls and People with Disabilities content, respectively, in section 3.

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Contents

Figures and tables

Dedication

This paper is dedicated to the memory of our dear colleague and mentor, the acclaimed Bangladeshi scientist, author and tireless loss and damage advocate, Professor Saleemul Huq, to whom we owe an immeasurable debt of gratitude.

Saleem inspired so many in the climate movement to become passionate about the cause of loss and damage finance, giving generously of his time to participate in countless panels and support and nurture the involvement of young people. In the case of Stamp Out Poverty, Saleem added his authoritative voice to a widely-viewed explainer film about loss and damage,[1] aimed at developed and developing country negotiators and the broader public, strongly conveying the message that achievement of a Loss and Damage Fund at COP27 was the litmus test for its success or failure. It is a fitting testament to Saleem's ceaseless work that he was there on the historic day in November 2022 when the Loss and Damage Fund was finally agreed.

Yet the challenge remains to get the Fund up and running and sufficiently financed. It falls to the community of academics, campaigners, negotiators, politicians and journalists moved to action by Saleem's forthright, but ever-calm and measured manner, to ensure his life's work comes to fruition in a meaningful way. Recognising his unwaning passion for climate justice and determination that those most responsible for causing the climate emergency need to pay for the impacts their actions have caused, we pledge to do all in our power to see the Loss and Damage Fund operationalised and fully funded to carry out the role that Saleem for so long fought for, to help the most vulnerable people on the frontline of catastrophic climate change in their most urgent hour of need.

David Hillman, Director of Stamp Out Poverty

1 The Global Story of Climate Change Loss and Damage - and Who Should Pay For It: https://www.youtube.com/watch?v=96wtZnglTCQ

Foreword

The following passage first appeared in the original edition of *The Climate Damages Tax report* published in December 2018 and is reproduced here by kind permission of the author, Avinash Persaud, who has most recently held the role of Special Envoy on Climate Finance to the Prime Minister of Barbados, Mia Amor Mottley.

Climate change is a war. A category five hurricane releases energy equivalent to 10,000 times the nuclear bomb dropped on Hiroshima in 1945. Those countries on the path of hurricanes and cyclones and submerging coasts are on the front line. In the space of a few hours after making landfall at 9pm on September 18th, 2017, Hurricane Maria caused destruction costing $1.4 billion, 226% of Dominica's GDP. On that day, climate change crashed out of theoretical construct into the lived reality of Dominicans; pulling the future into the present with a roar that echoed around the globe.

A few days after Maria hit Dominica, I was asked by the Prime Minister and Government to help coordinate and lead the economic recovery. I saw first-hand the enormous strength and resolve of the Dominican people. It makes me weep a little every time I am reminded of it. And the global community responded warmly. International development partners helped me establish the Climate Resilient Execution Agency of Dominica and put up close to 80% of Dominica's GDP in grant and concessional loan funding.

Yet despite this new awareness and action, the huge conferences and heartfelt generosity - humanity continues to avoid the key question. What lies at the heart of the problem we now face? Unless we respond to this, we cannot embrace a better direction of travel. The answer lies not in science, nor institutions. It is in the most straightforward interplay of morality and economics: **those who gain from the activities that created climate change are not the ones directly suffering its consequences**. Beyond its inherent injustice, this is the equation that propels climate change. Solutions that do not solve that equation have failed. Climate change is not a freak of nature. It is human-made, as human-made as power and greed. If the consequences of climate change were felt disproportionately by those who have contributed to it, it would have stopped long ago. That is the cold tap of fact.

Nationally, countries accept the 'polluter pays' principle - it is a golden nexus of morality, economics, and environmental policy. Presently, however, it is the battered and suffering in the paths of hurricanes and cyclones - not the polluter - who pays. Take the insurance model championed by many industrialised countries and agencies. It is a form of inter-temporal risk transfer. Island states on the front line are being asked to take on additional insurance against the future losses and damage of a climate change caused by others. Surely our main response to human-made climate change cannot be to try and make it easier for those on the receiving end to pay for it? Imagine if the only people who had to pay for car insurance were those who were hit by other people, and those that did the hitting paid nothing. And you will recall that the communities paying for climate change are mostly the poor, who live in the world's most precarious places. This is untenable, indefensible and reprehensible. We need a different approach than the traditional insurance model.

I call upon countries and the international institutions to read this report and help **establish a meaningful loss and damage funding facility**[2] paid into by those who have contributed to climate change, with payouts that go quickly to those who suffer the direct consequences of climate disasters. This report sets out an economically sensible approach through additional taxation on extraction activities.

We will only stop climate change by making those who contribute to it, pay for it. More talk, more conferences, more insurance where the victims are asked to pay by instalment, will not do the job. We need to end the mismatch between those who gain and those who lose. This is what an international community serious about halting climate change must do. From the countries on the front line, whose very existence is threatened; from the vanguard of those protecting our common earth; we urge you to do this. And we hope your feet are swift. We cannot afford to wait.

Avinash Persaud was Special Advisor to the Prime Minister of Dominica on the recovery from Hurricane Maria and is Special Envoy to the Prime Minister of Barbados on Investment and Finance

2 Rather than 'a loss and damage funding facility' being set up, what in fact took place was the establishment of the Loss and Damage Fund at COP27 in November 2022 and, a year later, the approval of its Governing Instrument at COP28.

Acronyms

6AR	Sixth Assessment Round
CCS	Carbon, Capture and Storage
CDBDR-RC	Common but Differentiated Responsibilities and Respective Capabilities
CDT	Climate Damages Tax
CERF	Central Emergency Response Fund
CO_2e	CO_2 equivalent
CVF	Climate Vulnerable Forum
FFE	Fossil Fuel Extractors
G7	Group of 7 advanced economies, including Canada, France, Germany, Italy, Japan, United Kingdom and United States
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIVE	Greenhouse Gas Impact Value Estimator
Global Fund	The Global Fund to Fight AIDS, Tuberculosis and Malaria
GPG	Global Public Good
IAM	Integrated Assessment Model
IMF	International Monetary Fund
IOPC Funds	The International Oil Pollution Compensation Funds
IPCC	The Intergovernmental Panel on Climate Change
LDCs	Least Developed Countries
LDF	Loss and Damage Fund
MRV	Monitoring, Reporting, and Verification
OECD	Organisation for Economic Co-operation and Development
SCC	Social Cost of Carbon
SIDs	Small Island Developing Countries
UNFCCC	United Nations Framework Convention on Climate Change
UNSG	United Nations Secretary General
WHO	World Health Organisation
WIM	Warsaw International Mechanism for Loss and Damage

Introduction

The Climate Damages Tax (CDT) addresses the injustice of climate devastation impacting populations around the world who did not cause the climate change but are left to pay for it without the means to do so. It looks to the fossil fuel industry - the burning of whose products are the root cause of the problem - who are currently making grotesque levels of profits in the hundreds of billions of dollars every year, to be held accountable for their actions. Most specifically, by being taxed considerably more to help pay for the skyrocketing bill for damages they have to date avoided.

The CDT is a fossil fuel extraction charge, levied on each tonne of coal, barrel of oil or cubic litre of gas produced. It would generate billions in extra income, most especially from fossil-fuel producing States. We propose that this substantial additional revenue is allocated in two ways. Firstly, it can help, particularly OECD countries contribute finance to the Loss and Damage Fund (LDF), without unfairly costing their taxpayers. Secondly, it will generate a significant domestic dividend that can be channelled to climate action nationally, helping to pay for the necessary support for workers and communities to transition away from fossil fuels, towards green energy and transport.

It is important to stress that with precious little of our carbon budget remaining, ideally we would have already stopped extracting and using fossil fuels allowing them to from now on remain in the ground. However, since this will still take a number of years, in the interim period as fossil fuels are phased out, the CDT is a valuable means to generate much-needed additional funds to benefit vulnerable populations facing catastrophic climate impacts. The CDT can also help accelerate fossil fuel phase-out by making its production more expensive. This is why we propose that the tax rate is ratcheted up annually adding costs to the fossil fuel industry's bottom line incentivising the shift from carbon. In this transition from fossil fuels, we need to deploy a diverse portfolio of financial instruments. While the CDT, levied at the point of fossil fuel extraction, will initially provide substantial funding for the LDF, the diversification of revenue sources will ensure the resilience and adequacy of funding as we progress towards a fully renewable energy future.

Beyond the revenue benefits, advocating for the CDT publicly links the fossil fuel sector to the ever-increasing frequency and intensity of climate damage we are witnessing across the world. Shining a spotlight on the fossil fuel producers in this way puts pressure on them to change their business model or risk their reputation with consumers and their influence over governments.

Stamp Out Poverty initially developed the Climate Damages Tax proposal in a paper that we published in December 2018 in which we argued strongly for the setting up of a Loss and Damage funding mechanism. In light of the decision to set up the LDF at COP27 and the historic agreement to operationalise it on the first day of COP28, with countries now focussed on how to mobilise sufficient funds to meet the costs associated with loss and damage impacts, we decided to revisit the paper to bring it fully up-to-date. By doing so, we offer decision makers a worked-up policy demonstrating a practical way to tap hitherto unharnessed revenue at scale from the very sector that caused the loss and damage crisis, and all its attendant costs, in the first place.

In this endeavour, we owe an important debt of gratitude to Julie-Anne Richards, the lead author of the first Climate Damages Tax report, who seeded the idea and helped so powerfully to develop the proposal. Below, we set out a brief overview of the sections of this paper.

Section 1 describes loss and damage giving the example of the Pakistan floods in 2022 before addressing the global scale of the loss and damage challenge, concluding with a section on the fossil fuel industry's culpability for the problem and sufficiently broad shoulders to be an important part of the funding solution.

Section 2 describes the academic and moral basis and precedents of the CDT and the mechanics of how tax revenue would be captured.

Section 3 addresses the importance of the CDT as one instrument in a basket of complementary measures, such as levies on maritime shipping, aviation and financial transactions, to generate finance for climate action. As well, how the CDT funds would be allocated both to the LDF and, via the domestic dividend, to climate action nationally.

Section 4 addresses CDT revenue, including starting rate, annual ratchet and potential to build into a robust income stream.

Executive Summary

Introduction

There is a price for heating up the planet. Currently it is borne to a vast extent by the populations affected by ever-intensifying climate impacts. To date, the fossil fuel producers have gotten away with not paying. Yet their products are the root cause of the crisis. The Climate Damages Tax (CDT) proposal, underpinned by the 'Polluter Pays' principle, makes the case that it is high time for the producers to bear a substantial proportion of the costs for losses and damages that result from the burning of fossil fuels. At the heart of the CDT proposition is the demand for redistributive justice. Those with the greatest historical responsibility for causing climate change, now need to pay for its consequences. At the UN conference, COP27, in November 2022, the demands of loss and damage-impacted communities were finally recognised in the historic agreement to establish a Loss and Damage Fund (LDF). This was followed in quick succession by the landmark agreement to operationalise the Fund at COP28. It is our contention that developed countries can raise a considerable part of the amount that needs to be contributed to the LDF through greater taxation of the fossil fuel industry, for example via the CDT.

Loss and Damage

By way of example, we consider the devastating floods in Pakistan in 2022, which were attributed to human-induced climate change. These floods resulted in significant loss and damage, with estimated damages exceeding $14.9 billion[3] and economic losses of $15.2 billion. The floods affected 33 million people, caused over 1,700 deaths, and had a disproportionate impact on the poorest and most vulnerable districts. In response, Pakistan launched a pledging drive, but 90% of the funds raised were in the form of loans, increasing the economic burden on the country at the worst possible time. Had the LDF been in existence and sufficiently funded, Pakistan could have applied for no-cost funds for the reconstruction and recovery of their severely impacted communities in a timely manner with a considerably better qualitative outcome for much of the population.

The Fossil Fuel industry

A significant proportion of global emissions can be attributed to a relatively small number of fossil fuel producers. From 1988 onwards, over half of the global industrial greenhouse gases (GHGs) can be traced back to just 25 corporate and state-owned producers.[4] However, the negative externalities of their operations, the warming of the world and the losses and damages that have ensued from the greater intensity and regularity of, for instance, fast onset climatic events, has not been factored into their costs. Countries and citizens have been left to pick up the pieces at their own expense. That has to change.

The profits of oil and gas companies have surged over the recent period, largely because of the Russian invasion of Ukraine, reaching an unprecedented $4 trillion in 2022.[5] The response of many countries to these excessive profits has been to introduce windfall taxes on the fossil fuel companies. Is it such a stretch then to ask governments to go further than one-off taxes and increase the tax burden on the industry as a whole on an annual basis? By any reasonable measure, recent levels of profits have been excessive, as are the remunerations of the CEOs of companies such as ExxonMobil, Chevron, BP and Shell.[6] With such broad shoulders, the industry can clearly afford to pay a far greater amount in taxation. For reasons, therefore, of historical responsibility, culpability for the present state-of-affairs and capability to pay, there is a strong moral and economic case for why levying greater taxation on the fossil fuel sector should be enacted at the earliest possible time.

3 Unless otherwise stated values are represented in USD

4 Carbon Majors Database. *CDP Carbon Majors Report 2017*

5 Source: IEA (2023) *World Energy Investment*

6 https://energy-profits.org

The Climate Damages Tax proposal

The Climate Damages Tax (CDT) is a fee on the extraction of each tonne of coal, barrel of oil, or cubic metre of gas, calculated at a consistent rate based on how much CO_2e is embedded within the fossil fuel. Working with existing systems of payment, fossil fuel companies, who already pay royalties (or similar) to the states where they operate, will pay an extra amount on the volume they extract to the Loss and Damage Fund.[7] We propose that the substantial additional revenue raised is allocated in two ways. Firstly, to assist OECD countries, in particular – who under the principle of Common-But-Differentiated-Responsibilities and Respective Capabilities (CBDR-RC) are seen as most able to provide finance to the LDF – to help pay for their contributions, without unfairly costing their citizens. Secondly, it will generate a significant 'domestic dividend' that can be channelled to climate action nationally, helping to pay for the necessary support for workers and communities to transition away from fossil fuels, towards green energy and transport.

Revenue potential

We recommend that the CDT is introduced in 2024 at a low initial rate of $5 per tonne of CO_2e increasing by $5 per tonne each year. If implemented at this rate, the CDT, as applied to OECD countries employing a 20% domestic dividend, would raise $44.6 billion for the LDF in year 1, $90.1 billion in year 2 and $119.8 billion in year 3. By the end of this decade, the cumulative figure for OECD revenue would be $900 billion, which equates to $720 billion to the LDF and, with a domestic dividend at 20%, $180 billion for OECD countries[8] to transition their economies.

For the G7,[9] with a 20% domestic dividend, $33.5 billion would be raised for the LDF in year 1. By the end of this decade, revenue would amount to $675 billion in total, with $540 billion for the LDF and (with a 20% domestic dividend) $135 billion for national climate action. If applied globally the cumulative total over this period would be in the region of $3.5 trillion. We provide the global figure only to demonstrate revenue potential. It is important to note that in the context of loss and damage while there is no obligation for developing countries to contribute, such contributions are encouraged on a voluntary basis.

Phasing out fossil fuels

With precious little of our carbon budget remaining, ideally we would have already stopped extracting and using fossil fuels allowing them to from now on remain in the ground. However, since this will still take a number of years, in the interim period as fossil fuels are phased out, the CDT is a valuable means to generate much-needed additional funds to benefit vulnerable populations facing catastrophic climate impacts whilst at the same time helping to accelerate fossil fuel phase-out by making its production more expensive. This is why we propose that the tax rate is ratcheted up annually adding costs to the fossil fuel industry's bottom line incentivising the shift from carbon.

Conclusion

OECD countries, of which a subset are the advanced economies of the G7, built their wealth off the back of industrialisation. The bulk of the greenhouse gases that have caused global warming are the result of activities in these countries leading to the increased level of loss and damage we see in the world today. Consequently, these states need to go first, furthest and fastest to capitalise the Loss and Damage Fund. The CDT, can be a major tool in a basket of measures, to raise the scale of finance required to create an LDF that is fit for purpose. It is feasible to implement and would be popular. It is desirable both for the tremendous benefit it would bring to climate-impacted countries and communities but also, through the domestic dividend, make an important contribution nationally in helping to pay for a transition to clean energy and green jobs. What is required is the political will to make it happen. We call on concerned citizens, organisations and countries, across the world, to join us in bringing this about.

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7 Stamp Out Poverty (2019). *The Climate Damages Tax - A guide to what it is and how it works*

8 Within the framework of international climate obligations, the following OECD countries: Mexico, Costa Rica, Colombia, Chile, and the Republic of Korea, are recognised as exceptions as they are considered non-Annex 1 countries. This is important to acknowledge to understand the diverse commitments and responsibilities that vary across different nations within the OECD in the context of global climate initiatives.

9 Figures given for the G7 comprise of numbers for the United States, Canada, Japan, and the United Kingdom with data for Germany, Italy, and France aggregated under a total European Union figure (reflecting the EU's inclusion as a non-enumerated member of the G7).

1 Loss and Damage

1.1 Describing Loss and Damage

In 2022, the Intergovernmental Panel on Climate Change (IPCC) which is the international body for assessing the science related to climate change, produced its Sixth Assessment Report. It concluded that the failure of climate action at anywhere near the urgency required and extent needed has ushered in the era of loss and damage. The findings of the report were referred to as an "atlas of human suffering and a damning indictment of failed climate leadership" by the UN Secretary General, Antonio Guterres.[10]

Loss and damage refers to the adverse impacts of climate change that persist despite efforts to mitigate and adapt. It encompasses the irreversible and non-recoverable losses suffered by communities, ecosystems, and economies due to the impacts of climate change and can arise from both acute events, such as heatwaves and tropical cyclones, as well as gradual processes like drought, rising sea levels and ocean acidification. Commonly, loss and damage is classified into economic and non-economic categories. Economic loss and damage represents the negative impacts that can be quantified in monetary terms. These include costs associated with the reconstruction of flood-damaged infrastructure or the financial losses resulting from the destruction of agricultural crops due to drought. Non-economic loss and damage entails negative consequences that are challenging to assess in monetary values. These include mental and physical health, the erosion of community cohesion due to the displacement of individuals, the depletion of biodiversity and the destruction of ecosystems, as well as the loss of language, culture and sacred places. These losses are for the most part beyond financial measure.

The IPCC has emphasised the importance of ambitious mitigation action to avoid crossing adaptation limits and even greater irreversible consequences. The scientific consensus is that with every increment of warming, the frequency and severity of losses and damages will also increase, pushing human and natural systems closer to their limits.[11] The report highlights that countries are currently already experiencing greater instances of loss and damage. This is not something happening in the near future, it is the lived experience of vulnerable communities now with compounding and cascading effects to societies and economies. This foundational scientific report indicates that near-term action to limit global warming to 1.5°C would significantly reduce, but critically will not eliminate future losses and damages. In fact, in a 1.5°C world, extreme sea level events that previously occurred once in 100 years could happen every year by the end of this century;[12] 90.6% of reefs will suffer intolerable thermal stress;[13] and every region will face increasing changes across their ecosystems.

In 2023 alone we have seen devastating twin tropical cyclones tear through Vanuatu leaving a trail of devastation and broken lives with people in a constant cycle of recovery.[14] In Malawi, Tropical Cyclone Freddy affected more than 2.2 million people and displaced over 650,000 people resulting in an estimated $347.2 million in damages and $159.5 million in losses.[15] In July 2023, global air and global ocean surface temperatures set new all-time records with devastating consequences for people and ecosystems with the unprecedented coral bleaching events across the Americas being of particular concern.[16]

The UN Special Rapporteur on the Protection of Human Rights in the context of Climate Change, Ian Fry, has shed light on the multiple human rights violations faced by those displaced due to climate change, including infringements on their rights to food, water, sanitation, housing, health, education, and even the basic right to life. He has noted that "In 2020 alone, 30.7 million people were displaced from their homes due to weather-related events. Droughts were the main factor."[17]

10 https://media.un.org/en/asset/k1x/k1xcijxjhp

11 IPCC AR6 WG2 SPM Headline Statements

12 IPCC Working Group 2: Climate Change 2022: Impacts, Adaptation and Vulnerability

13 Dixon, A. M., Forster, P. M., Heron, S. F., Stoner, A. M., & Beger, M. (2022). Future loss of local-scale thermal refugia in coral reef ecosystems. *PLoS Climate,* 1(2)

14 Wilson, C (March 27, 2023). *Picking up the pieces after twin cyclones hit Vanuatu*

15 Government of Malawi. (2023). *Malawi 2023 Tropical Cyclone Freddy Post-Disaster Needs Assessment*

16 Readfearn, G. (July, 2023). *'Huge' coral bleaching unfolding across the Americas prompts fears of global tragedy*

17 UN News (June 27, 2023). *Legal protection essential for people displaced by climate change: UN expert.*

1.2 Breakthrough decision to set up the Loss and Damage Fund at COP27

In international climate negotiations, loss and damage was discussed for three decades with very little progress. In 2022, at the climate conference, COP27, a major step forward was achieved. COP 27 and CMA 4[18] established a Fund and new funding arrangements for assisting developing countries in their response to loss and damage. The decision established a Transitional Committee with the goal to make recommendations for consideration and adoption by the 2023 climate conference, COP 28 and CMA 5.[19] This long-awaited breakthrough happened following the catastrophic floods that devastated Pakistan a few months earlier.

1.3 Agreement to operationalise the Loss and Damage Fund at COP28

After lengthy negotiations in five meetings of the Transitional Committee during 2023, diplomats succeeded in bringing a text for the operationalisation of the LDF to COP28 where (unprecedentedly) it was approved on the opening day. The host country, the United Arab Emirates, along with several other countries, including several EU member states, made initial pledges to the Fund amounting to $661.39 million (USD).[20]

The document establishing the Governing Instrument[21] sets out that there is an "urgent and immediate need for new, additional, predictable and adequate financial resources", as well as (in paragraph 54) that it is "able to receive contributions from a wide variety of sources of funding, including grants and concessional loans from public, private and innovative sources, as appropriate."

Although, at the time, there was much acclaim for the approval to establish the LDF and the opening pledges, the reality is that this level of funding – as the next section on the Pakistan floods describes – is woefully inadequate to the scale of the problem and lacks the commitment required to the Fund's capitalisation and subsequent replenishments. Without holding financial resources at sufficient scale and a clear plan to recapitalise on a regular basis, the progress at COP28 risks appearing more like a publicity stunt than a genuine step towards creating a LDF fit for its intended purpose. This is why the time for measures such as the Climate Damages Tax has arrived.

1.4 The Pakistan floods in 2022

By way of example, we consider the devastating floods in Pakistan in August 2022. The country received more than three times its usual amount of rain during the monsoon season, with the worst hit provinces receiving 7 to 8 times their monthly rainfall. More than 1,700 people died and 33 million were affected with a disproportionate impact on the poorest and most vulnerable districts. The World Bank[22] reported that the flooding caused significant loss and damage estimated at $30.1 billion in total with the cost of damages estimated at $14.9 billion and economic losses at $15.2 billion. Rehabilitation and reconstruction needs were significant at $16.3 billion. A rapid attribution analysis[23] found that human-induced climate change likely worsened the heavy rainfalls that Pakistan experienced.

18 CMA is the Conference of the Parties Serving as the Meeting of the Parties of the Paris Agreement. It is tasked with overseeing the implementation of the Paris Agreement

19 Decisions 2/CP.27 and 2/CMA.4

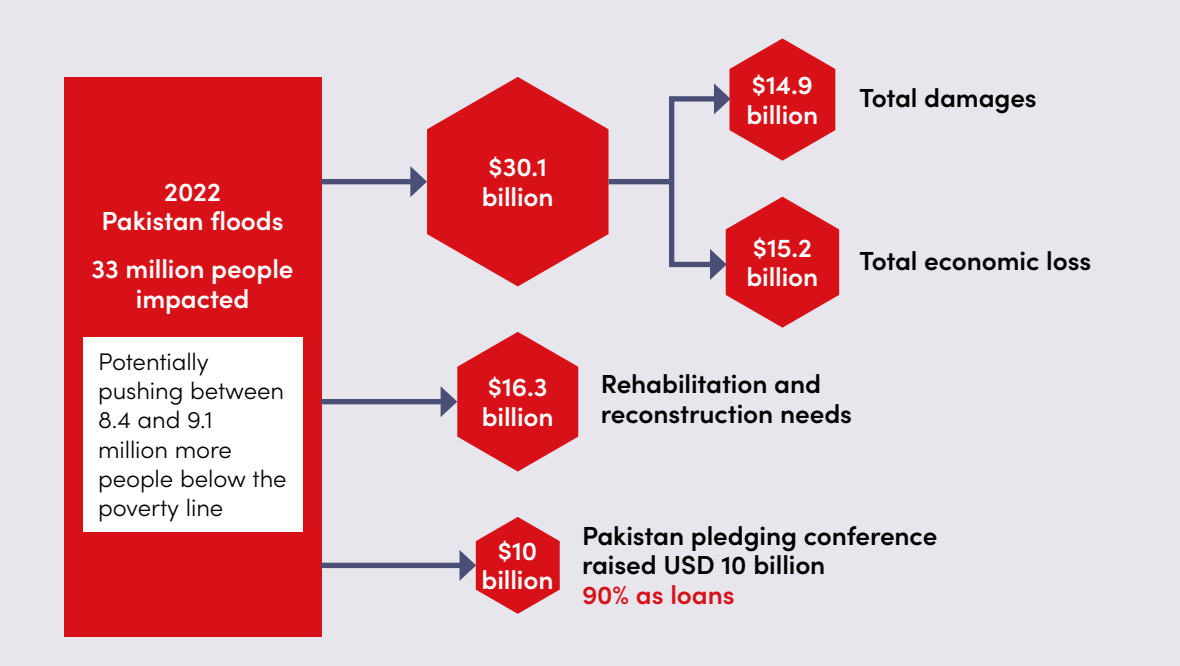
20 https://unfccc.int/process-and-meetings/bodies/funds-and-financial-entities/loss-and-damage-fund-joint-interim-secretariat/pledges-to-the-loss-and-damage-fund

21 COP28 decision to operationalise the L&D Fund: https://unfccc.int/sites/default/files/resource/cp2023_L1_cma2023_L1.pdf

22 World Bank (2022). *Pakistan: Flood Damages and Economic Losses Over $30 billion and Reconstruction Needs Over $16 billion - New Assessment*

23 WMO (16 September, 2022). *Climate change likely increased intense rainfall in Pakistan: study.*

FIGURE 1: Impacts of Pakistan floods[24]



The immediate loss of food, coupled with long-term damage to arable land, left 10 million children without adequate nutrition. This had long-term economic implications as it affected the future productivity of this generation. The recovery of the country's agricultural sector, a significant source of livelihoods and food security, was projected to take decades. The floods also had a severe impact on the natural environment, causing extensive damage to forests and wildlife. The post-flood scenarios included the spread of epidemic diseases and the destruction of habitats.

At the International Conference on a Climate Resilient Pakistan, co-hosted by the Government of Pakistan and the United Nations, in January 2023, the UN Secretary General said to delegates: "If there is any doubt about loss and damage, go to Pakistan." In respect of revenue raised, $10 billion was pledged for the country's reconstruction with 90% in the form of loans.[25] Taking on more debt for a nation in a balance-of-payments crisis is economically unsustainable, particularly given its extreme exposure to further climatological disasters. Pakistan is trapped in a constant loop of crises and debt repayments to external creditors making recovery, rehabilitation and reconstruction increasingly difficult.

Beyond the $10 billion pledged, there was a $20 billion shortfall that fell on the native population. This is especially morally unjust since the people themselves were not responsible for the temperature rise that caused the climate impacts.

Had the LDF been in existence in 2022, Pakistan would have been able to apply for no-cost funds for the reconstruction and recovery of their severely impacted communities in a timely manner with a considerably better qualitative outcome for a significant proportion of their population.

24 Data source: World Bank (2022). Pakistan: Flood Damages and Economic Losses Over $30 billion and Reconstruction Needs Over $16 billion - New Assessment

25 Cleetus R, (2023) A Year After the Deadly Pakistan Floods Began, Hard Lessons About Climate Loss and Damage. Blog. Union of Concerned Scientists.

1.5 Funding requirement for Loss and Damage

The cost of the Pakistan floods speaks to the size that the LDF will need to be in terms of funds to respond at sufficient scale to the loss and damage challenge we face. But Pakistan is just one country. What are the financial requirements for addressing loss and damage globally, particularly since these costs continue to grow year on year?

To provide an indication of the scale of the problem we can look to different sources such as the insurance provider AON,[26] who reported that natural disasters caused global economic losses of $313 billion in 2022. AON's third quarter report for 2023 estimates that it is likely that the annual losses for 2023 will approach or even surpass the long-term ($310 billion) and decadal ($339 billion) averages.[27] The economic cost of loss and damage has been projected at between $290 billion and $580 billion by 2030 alone, escalating thereafter.[28] A report by Christian Aid[29] found that with current climate policies, Least Developed Countries (LDCs), Small Island Developing Countries (SIDs) and nations that are members of the Climate Vulnerable Forum (CVF), on average, can expect to see climate change reducing their GDP growth by 19.6% by 2050 and by 63.9% by 2100. Whilst the World Bank estimates climate-related damages at $12.6 billion every year, or more than 12% of the GDP of the Caribbean Community.[30]

"The Loss and Damage Finance Landscape[31]" discussion paper states that major climate and weather events in developing countries in 2022 caused more than $109 billion in losses. However, this does not take into account smaller events which may have been devastating for a local community, slow onset impacts, or non-economic loss and damage. Consequently, it can be concluded that the loss and damage costs faced by developing countries in 2022 were considerably greater. Estimating funds needed to pay for recovery, reconstruction and relocation resulting from the impacts of loss and damage is not an exact science. Taking into account historical data and the sources cited above, we conclude that the current loss and damage funding requirement falls in the range of $300 - $450 billion per annum. The central point is that the scale of the response needed to address loss and damage does not lie in the hundreds of millions but in the hundreds of billions, which is why harnessing untapped revenue, through a measure like the CDT, is so necessary.

The financing to pay for loss and damage needs to be additional to funding for mitigation (shifting energy sources from fossil fuels to renewables), adaptation, traditional development and humanitarian & disaster response, as these areas currently lack sufficient financial resources. It is therefore important for governments to consider new sources of finance to assist them in making their payments to resource the LDF. We contend that it is high time that the sector that has profited the most from activities that have led to the warming of our planet should now be made to make a substantial contribution to the LDF. Taxing this historically polluting industry to a far greater degree is seen as fair, timely and overdue.

26 AON (2023). *Weather, Climate and Catastrophe Insight*

27 AON (2023). *Q3 Global Catastrophe Recap October 2023*

28 Markandya, A., & González-Eguino, M. (2019). Integrated assessment for identifying climate finance needs for loss and damage: A critical review. Loss and Damage from Climate Change. Concepts, Methods and Policy Options, 343-362.

29 Christian Aid (2021) *Lost & Damaged A study of the economic impact of climate change on vulnerable countries*

30 Akiwumi, P (2022). *Climate finance for SIDS is shockingly low: Why this needs to change.* UNCTAD.

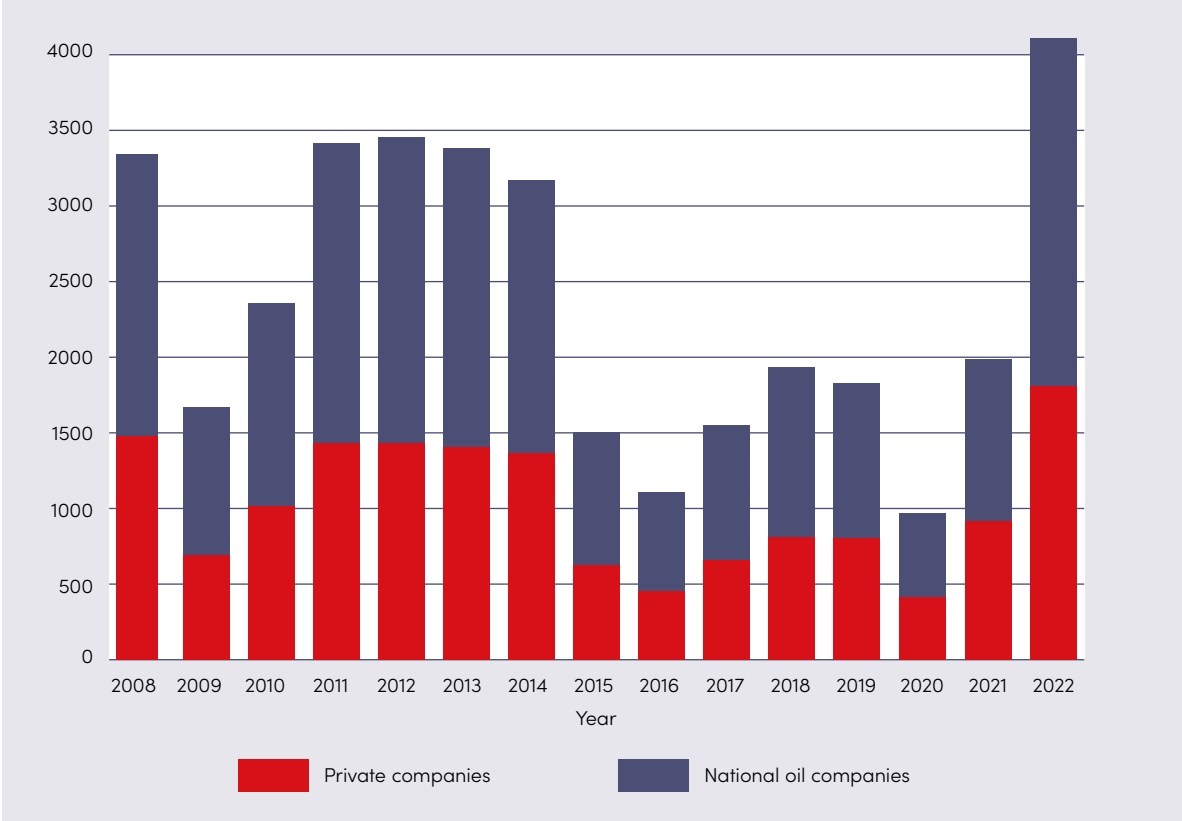
31 Richards, J.A, Schalatek, L., Achampong, L., & White, H. (2023) *The Loss and Damage Finance Landscape.* L&DC, Heinrich Böll Stiftung

1.6 The Fossil Fuel industry

A significant proportion of global emissions can be attributed to a relatively small number of fossil fuel producers. Studies such as those conducted into the Carbon Majors have indicated that approximately 100 entities are accountable for a substantial share of all emissions since the onset of the industrial revolution. From 1988 onwards, over half of the global industrial greenhouse gases (GHGs) can be traced back to just 25 corporate and state-owned producers.[32]

In 2022, particularly due to the Russian war with Ukraine, the fossil fuel industry reached a record high net income of $4 trillion (Figure 2).

FIGURE 2: Net income of the global oil and gas industry – 2008–2022[33]



The industry is "estimated to have made $2.8 billion in profits per day over the last 50 years – $1 trillion (£891 billion) a year and a staggering total of $52 trillion (£46 trillion). In a scenario where fossil fuel companies were asked to foot the entire bill of climate damages…this is equivalent to roughly 30-60% of their current annual profits."[34]

By any reasonable measure, these levels of profits are excessive, as are the remunerations of the CEOs of companies such as ExxonMobil, Chevron, BP and Shell.[35] With such broad shoulders, the industry can clearly afford to bear a far greater burden of taxation, especially since it still enjoys extraordinary levels of subsidy, $7 trillion in 2022 according to the IMF.[36] Calls for an immediate end to production subsidies and their redirection into renewable sources, such as solar, tidal and wind, are beyond the remit of this paper but would appear to be an obvious step in fashioning an energy and industrial strategy fit for this century.[37]

32 Carbon Majors Database. *CDP Carbon Majors Report 2017*
33 Source: IEA (2023) *World Energy Investment*
34 Gerretsen, I (October 2022), What if polluters footed the climate bill. *Future Planet.*
35 https://energy-profits.org
36 https://www.imf.org/en/Topics/climate-change/energy-subsidies
37 McCulloch, N. (2023). Ending Fossil Fuel Subsidies - the politics of saving the planet. *Practical Action.*

Despite being aware for several decades of the risks fossil fuels pose to our survival,[38] some of the largest fossil fuel companies continue to orchestrate extensive public relations campaigns to influence governments into inaction. They have moved on from a climate change denial approach to one based on delay, convincing decision-makers that advances in science make it acceptable to continue fossil fuel production as, for instance, the carbon that would be released can instead be captured and stored. Regrettably, given how much is at stake, Carbon, Capture and Storage (CCS), is not a proven, nor a cost-effective technology and only serves to perpetuate fossil fuel use.[39] Other dangerous untested techno-fixes, such as solar geoengineering by means of stratospheric aerosol injection,[40] are even more irresponsible. All these approaches have one thing in common, to distract decision-makers from moving down the obvious path to as rapid a fossil fuel phase-out as possible, ensuring that workers in these industries are retrained or compensated in the process.

As attribution science advances, litigation against fossil fuel companies for climate change damages is likely to rise. Notable cases include a Peruvian farmer suing Germany's RWE[41] for glacier melting due to its emissions, and Torres Strait Islanders[42] winning a case against Australia in 2022 for inaction on climate change, setting a precedent for individual claims on human rights grounds. In 2023, the UN General Assembly sought an advisory opinion from the International Court of Justice on states' climate obligations, potentially clarifying legal stances,[43] while the State of California sued Big Oil for decades-long deception and damage, reflecting a global trend of increasing climate litigation.[44]

These legal actions echo the tobacco industry's obfuscating strategy in fighting compensation claims. The Master Settlement Agreement in 1998 saw tobacco companies agree to pay $206 billion and curb marketing practices. A similar tipping point may be approaching for the fossil fuel industry, with legal liability on a planetary scale.[45]

38 Hall, S (2015) Exxon Knew about Climate Change almost 40 years ago. *Scientific American.*

39 https://sifted.eu/articles/case-against-ccs

40 Parker, A., & Irvine, P. J. (2018). The risk of termination shock from solar geoengineering. *Earth's Future,* 6(3), 456-467.

41 Climate Change Litigation Database (nd). Luciano Lliuya v. RWE AG

42 UNOHCHR (September 2022). Australia violated Torres Strait Islanders' rights to enjoy culture and family life, UN Committee finds

43 UNEP (2023). UN resolution billed as a turning point in climate justice

44 Superior Court Of The State Of California County Of San Francisco (2023). Complaint for Abatement, Equitable Relief, Penalties, and Damages

45 Stamp Out Poverty (2019). *The Climate Damages Tax - A guide to what it is and how it works*

2 The Climate Damages Tax

2.1 Design

The Climate Damages Tax (CDT) would make a substantial contribution to the financial inputs of the Loss and Damage Fund (LDF) with a significant domestic dividend flowing to fossil fuel producing States to be spent on climate action nationally, particularly helping to pay for the necessary support for workers and communities to transition away from fossil fuels, towards green energy and transport.

It needs to be strongly emphasised that the CDT proposal places the onus of payment of revenue to the LDF on developed countries, who have the greatest fossil fuel footprint through their industrialisation and ability to pay through the wealth they have historically accrued. We stress that there is no obligation on non-Annex 1 countries to fund the LDF. However, there is a case to be made that countries from this grouping, such as the Gulf States, who have derived their considerable wealth from fossil fuel extraction, may wish to employ the CDT as a means to make a voluntary contribution to the LDF and, through the domestic dividend, invest in green transformation nationally.

2.2 Rationale

The academic and moral case for the CDT is based upon the following widely accepted principles of customary international law as asserted in the UN Stockholm Declaration (1972) and re-asserted in the UN Rio Declaration (1992), the UN Framework Convention on Climate Change (1992) and the Paris Agreement (2015):[46]

- **The principle of Common-But-Differentiated-Responsibilities and Respective Capabilities** (CBDR-RC) as set out in Article 3.1[47] of the UN Framework Convention on Climate Change (UNFCCC), which states that: "The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof."
- **The Polluter Pays principle** is also included in the Rio Declaration, Principle 16,[48] which states that: "the polluter should, in principle, bear the cost of pollution". Within the UNFCCC it is widely held that the operative provisions, and specifically CBDR-RC, implicitly recognises this principle. This is the notion that those in control of a polluting activity, including companies, should be held liable for harms caused by the activity.
- **The No-Harm Principle** which is regarded as a cornerstone of environmental law and is also known as the Principle of Prevention of Transboundary Harm as set out in the preamble of the UN Framework Convention on Climate Change.[49] Under this principle, states are 'duty-bound to prevent, reduce and control the risk of environmental harm to other states', and make reparation or compensation for injury caused.[50]

46 Dinah Shelton. 2008. Stockholm Declaration (1972) and Rio Declaration (1992). Oxford Public International Law. http://opil.ouplaw.com/view/10.1093/law:epil/9780199231690/law-9780199231690-e1608

47 UNFCCC (1992). FCCC/INFORMAL/84 GE.05-62220 (E) 200705

48 Rio Declaration. (1992).

49 UNFCCC (1992). FCCC/INFORMAL/84 GE.05-62220 (E) 200705

50 Legal Response Initiative. (2012). *No Harm Rule and climate change.*

2.3 Precedents in collection and disbursement of revenue

- **Circumventing national treasuries:** A precedent for a model of collection that sends a fee directly to the body that will deploy the funds for an internationally-agreed Global Public Good (GPG) is the International Oil Pollution Compensation Funds (IOPC Funds). It provides compensation for oil pollution damage from tanker spills primarily paid for by contributions from entities involved in maritime transport. Importantly, contributions are paid by individual contributors directly to the Fund by-passing national treasuries. Following this precedent, Fossil Fuel Extractors (FFEs) would send their CDT remittance directly to the LDF. This is our preferred method of collection, which is illustrated in figure 3 below.

- **Collected nationally, directed to an international fund:** An alternative precedent for the collection of revenue to pay for an internationally-agreed GPG is the Airline Solidarity Levy.[51] This tax on airline tickets, pioneered by France (in 2006), was introduced to raise funds for UNITAID, to carry out its life-saving work purchasing and disseminating drug treatments for HIV/AIDS, TB and malaria. The Airline Solidarity Levy has now been implemented in several countries, including South Korea, Chile, Madagascar and Mauritius. Between 2006 and 2015, UNITAID received $ 2.5 billion in contributions, 63% of which came from air ticket levies.[52]

  Under this scenario, the Fossil Fuel State applies a CDT surcharge over and above the royalty currently levied on the Fossil Fuel Extractor. In the case of countries with the respective capability to do so, the surplus revenue is divided between the LDF and domestic spending in support of workers and communities to transition away from fossil fuels, towards green energy and transport. For other countries, the surplus revenue can be spent solely on green infrastructure and supporting citizens in their transition to a fossil-free economy. In this model, the tax revenue is captured by a country's Finance Ministry, which leads to the risk that it is not allocated to the LDF,[53] which is why, on balance, we propose the former precedent as the preferred model for CDT collection.

2.4 The Climate Damages Tax proposal

The Climate Damages Tax (CDT) is a fee on the extraction of each tonne of coal, barrel of oil, or cubic metre of gas, calculated at a consistent rate based on how much CO_2e is embedded within the fossil fuel. Working with existing systems of payment, fossil fuel companies, who already pay royalties (or similar) to the states where they operate, will pay an extra amount on the volume they extract to the LDF.[54]

The payment and collection process is set out in the diagram below: the first three steps involve notification, the last three involve payment.

51 French Ministry of Foreign Affairs (2013) French Contributions to the Global Fund to Fight Aids, Tuberculosis and Malaria

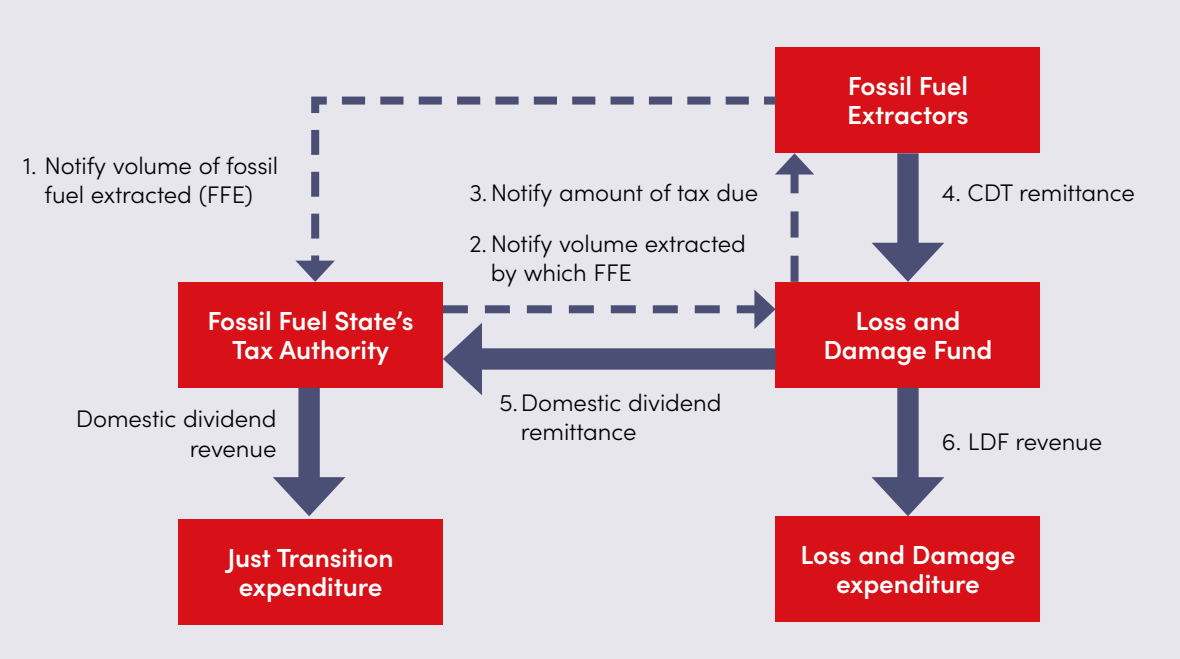
52 UNITAID (2016) UNITAID at 10

53 This phenomenon is described as the 'domestic revenue problem' identified by Benito Mueller in *Oxford Energy and Environment Comment June 2009* for the Oxford Institute of Energy Studies (2009).

54 Stamp Out Poverty (2019). *The Climate Damages Tax - A guide to what it is and how it works*

2.5 Payment and collection

FIGURE 3: Diagram illustrating the payment and collection process of the CDT



2.5.1 Steps to capture CDT revenue

Step 1: Fossil Fuel Extractors (FFEs) declare volumes and emission profile of coal, oil and gas extracted to the tax authority of the country of extraction, the Fossil Fuel State (FFS), in accordance with existing arrangements of royalty (or similar) on quantity of fossil fuel extracted.

Step 2: The Fossil Fuel State's tax authority notifies the Loss and Damage Fund of the volume extracted by each Fossil Fuel Extractor, alerting them that the CDT remittance is due.

Step 3: The LDF calculates the CDT remittance due from each FFE using the volume extracted, its emissions profile and the tax rate, and notifies the Fossil Fuel Extractor of the amount due.

Step 4: The Fossil Fuel Extractor pays the CDT remittance to the Loss and Damage Fund.

Step 5: The Loss and Damage Fund remits a proportion of the CDT revenue to the tax authority of the Fossil Fuel State from where the fossil fuel was extracted. This amount, we term the domestic dividend, is for national spending on climate action, supporting workers and communities to transition away from fossil fuels, towards green energy and transport.

Step 6: The remaining proportion of the CDT remittance contributes to the finances of the LDF to pay for claims from loss and damage-impacted countries and communities.

2.6 Compliance

Fossil fuel extractors are legally obliged to report volumes of coal, oil or gas extracted to pay due royalty (or similar) to the country that has granted a licence permitting extraction. They would also have a legal duty to pay the CDT or risk a penalty, which we anticipate to be a substantial financial sanction. Further, non-compliance of tax obligations carries the serious threat of reputational risk and brand damage.[55]

55 Stamp Out Poverty (2019). *The Climate Damages Tax - A guide to what it is and how it works*

2.7 Distributional impact

Organisations like Stamp Out Poverty have worked over many years in the field of the taxation of globalised activities, such as finance, aviation and fossil fuels, particularly to harness untaxed, or under-taxed, areas of economic activity to capture additional revenue. For industries challenged to pay more in tax, the traditional first line of attack is the repost that the tax will not be paid by them, that "they will pass the cost on to the consumer". In this section, we address the question who will ultimately pay the CDT? In other words, where does the economic impact fall?

In fact, the assumption that an increase in price will automatically be passed on to the customer is open to question for two reasons:

1. Governments can, and have powers to, intervene to protect their citizens from unreasonable or excessive price impositions by controlling, or substantially influencing, the prices suppliers may charge.[56]

2. Companies absorb the cost, in whole or in part, to protect their market share so that their ability to pass the costs onto customers directly is restricted.

Certainly, in the case of the CDT, the consumer should not be the one to pay. Given that the fossil fuel industry is estimated to have made $2.8 billion in profits per day over the last 50 years (see section 1.6, above),[57] it is clear that the industry that has for so long been enjoying excessive profits should be the one to bear the cost of the CDT. Governments, should, therefore, where possible, regulate to control the cost passed on to consumers by requiring fossil fuel corporations to demonstrate they are paying the CDT from their profits.

In many countries fuel is a highly competitive market, making it unlikely that the full cost increase from the CDT will be passed to consumers. However, even if a proportion were passed on, the price impact of the CDT on different fuels, within its first few years, would be minimal in comparison with normal annual price volatility. In the UK, for example, whilst there has been a trend in the direction of rising prices (especially most recently), over the last decade, fuel prices for motor vehicles have often fluctuated by 10% or more in the period of a year.[58] In the initial years of CDT introduction, the cost would be within this range of price fluctuation which consumers are already subject to and hence they would not be additionally penalised by company efforts to pass on the costs to them.

Most importantly, however, it is the domestic dividend component of the proposal (see section 3.2 below), that can most ameliorate the situation in respect of who would actually bear the burden. The CDT will raise significant finance for just transition, to help fund programmes for low income communities to shift to public transport, cycling and walking, or electric cars, further reducing their exposure to any cost increases in the price of fossil fuels. It could also be used to insulate homes, switch to energy efficient appliances and install renewable and community power. Use of this additional government revenue to incentivise and support changes in consumer behaviour as we transition to a green economy constitutes a powerful means to protect citizens from the distributional impacts that may arise in the medium-term from the introduction of the CDT.

56 Office of Fair Trading (2009) *Government in markets* - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284451/OFT1113.pdf

57 Gerretsen, I (October 2022), What if polluters footed the climate bill. *Future Planet.*

58 https://www.racfoundation.org/data/uk-pump-prices-over-time

3 Allocation of revenue

The CDT is a powerful tool for channelling financial resources to address the impacts of climate change. We propose that CDT revenue is allocated in two ways: to support the needs of impacted populations through the LDF and investing in national climate action through the domestic dividend. This bifurcated approach ensures that while we are contributing to the global effort to respond to climate impacts, we are also investing in our domestic transition to a green economy.

3.1 The Loss and Damage Fund

The LDF was ultimately agreed at COP27, and operationalised at COP28, because the substantial funding gap to address loss and damage, as set out in the figure below, was finally recognised as almost entirely missing from the financial architecture required to respond to the needs of people facing climate impacts.

FIGURE 4: Illustrating the funding gap for support to address loss and damage[59]

	Averting loss and damage	Minimising loss and damage	Addressing loss and damage		
Impacts			Reversible → Irreversible		
			• Super storms • Heatwaves • Forest fires • Floods • Droughts	• Sea level rise • Desertification • Glacial melt • Erosion	• Loss of biodiversity (including extinction of species)
Mitigate **Adapt** **Address**	Climate change mitigation Reducing greenhouse gas emissions	Climate change adaptation Risk reduction: • early warning • emergency preparedness • building dykes • retrofitting infrastructure	Recoverable → Permanent and irrecoverable losses		
			Economic losses → Non-economic losses		
			Humanitarian assistance: • relief • recovery • reconstruction • rehabilitation • social protection • resilient rebuilding		Loss of culture Loss of heritage
Displacement			Temporary displacement	Permanent relocation	Loss of territory
Funding	Dedicated but insufficient		Limited → No funding		

3.1.1 New sources of finance

As cited in section 1.3 above, the LDF will be able to receive contributions from a wide variety of sources of funding, including grants from public, private and innovative sources.[60]

Funds required to capitalise the LDF will need to come in the form of grants from industrialised countries additional to their current spending on development and climate action, or it will come at the expense of traditional development spending on areas such as health and education or

59 Stamp Out Poverty., HBS., et al (2021). *Spotlighting the finance gap: What differentiates finance for addressing loss and damage from other types of finance?*

60 UNFCCC (2023) *Operationalization of the new funding arrangements, including the fund, for responding to loss and damage referred to in paragraphs 2–3 of decisions 2/CP.27 and 2/CMA.4, Annex 1,* paragraph 54: https://unfccc.int/sites/default/files/resource/cp2023_L1_cma2023_L1.pdf

investment in mitigation and adaptation. Taking from already stretched budgets to pay for the LDF would be entirely unacceptable - new money needs to be brought to the table. For this reason, a proposal like the CDT is timely, as it serves as a means for countries to capture substantial additional revenue to assist with their efforts to contribute to the LDF. Arguably, provided safeguards from the domestic dividend (see section 3.2) were in place to ensure that the costs did not negatively impact their citizens, it would also be popular.

Given the scale of finance required for climate action, it is important to view the CDT as one instrument in a basket of complementary measures, including other forms of taxation on the fossil fuel industry, such as higher taxes on profits and on the industry's trading activities through the supply chain, as well as levies on maritime shipping, aviation and financial transactions. In this regard, the Taskforce on international taxation to scale up development, climate and nature action launched at COP28,[61] spearheaded by by Barbados, France and Kenya, is an important indication that political space is opening up at this time for the serious consideration of solidarity levies to boost income generation. The initiative has been joined by Spain, Ireland, Barbados, the Republic of the Marshall Islands and Antigua and Barbuda, with the European Commission as an Observer. It follows from the Summit for a New Global Financial Pact held in Paris in June 2023 and the Africa Climate Summit hosted a few months later by Kenya's President Ruto in Nairobi.

The taskforce is headed by respected French economist, Laurence Tubiana, and will be structured with three different levels: a Heads of States and Governments Level Group to provide political leadership; a Sherpa Working Group composed of government representatives; and an Advisory Group of experts in the field of international taxation. The taskforce offers an important opportunity to present and take forward proposals like the CDT giving them a far greater possibility of political adoption.

3.1.2 Debt-free finance

It is imperative to utilise grant-based instruments to fund the LDF to prevent further deepening the debt burden of recipient countries. The issue of debt is of major concern across the spectrum of climate action: loss and damage; adaptation; and mitigation. It has been shown[62] that high debt levels are a major barrier to phasing out fossil fuels for many global south countries. Given the phaseout trajectories outlined by the IPCC, resorting to debt-based instruments to address loss and damage would be counterproductive and exacerbate the situation. In respect of loss and damage, on a principled note, lower-income countries have contributed minimally to the causes of climate change. It is unjust and inequitable to expect them to borrow and thereby increase their debt to cope with the impacts of a crisis they played virtually no part in creating.

The Fund's disbursement mechanism must prioritise grant-based instruments to avoid exacerbating the debt burden of recipient countries, aligning with both the need for a just and equitable transition and the polluter-pays principle. The CDT is a means by which the oil majors such as BP, Shell, and Exxon Mobil would contribute to the Fund based on their extraction practices. In this manner, the CDT would generate additional, predictable, debt-free finance for the LDF.

3.1.3 The need for gender-transformative climate action

In the face of climate disasters, women and children are up to 14 times more likely to die than men,[63] and the greater the gender and economic inequality, the greater the disparity between men and women's chances of survival.[64] 80% of people displaced by climate disasters are women.[65] When water sources dry up, women and girls must walk further to fetch water. When crop failure impacts family income, women are more likely to skip meals than men. When climate change leaves families hungry, women report higher incidences of domestic violence.[66]

The climate crisis has differential impacts on women and men due to existing gender hierarchies, gendered divisions of labour and dominant gender norms.[67] Gendered divisions of labour often place women's spheres of economic activities closer to the environment as they tend to be more reliant

61 https://jp.ambafrance.org/IMG/pdf/launch_of_the_taskforce_on_international_taxation.pdf?30219/48ca78dcd505694cff008f730a7d50a10e4d5a05

62 Woolfenden, T (2023). *The Debt Fossil Fuel Trap - Why debt is a barrier to fossil fuel phase-out and what we can do about it.*

63 UN Women. (2018). *Turning Promises into Action: Gender Equality in the 2030 Agenda for Sustainable Development.*

64 Neumayer, E. (2007). *The gendered nature of natural disasters.*

65 UNDP. (2016). *Overview of linkages between gender and climate change.*

66 ActionAid. (2016). *Hotter Planet, Humanitarian Crisis.*

67 ActionAid UK. (2022). *Women confronting loss and damage in Africa.*

on the agricultural sector for their livelihoods, particularly in small and rain-fed farms.[68] However, in many countries around the world, women face more barriers than men in seeking to own land, access bank loans, purchase farming equipment, secure employment, or access information on climate change.

In light of this, there is an urgent need to prioritise gender-transformative climate action, in particular through the Loss and Damage Fund. To address the disproportionate impact of climate change on women and girls, the Loss and Damage Fund should have provisions for direct access by communities in all developing countries, enabling women-led and women's rights organisations to lead recovery and rebuilding. The Fund should also mobilise needs-based, grants-based, resources and be new and additional to existing ODA and climate finance commitments, to ensure that women and girls receive the scale of assistance they need to fully recover and to not induce further debt in their countries and communities.

3.1.4 The need for disability-inclusive climate action

Persons with disabilities living in low-income country's most at risk of climate change[69] face serious threats to their lives, homes, health, food security, access to water, sanitation, and livelihoods,[70] as well as affecting their rights to accessibility, independent living, inclusion in the community and personal health.[71] In extreme cases, persons with disabilities are more likely to die or become even more marginalised due to the climate crisis including climate induced disasters.[72] Evacuation in response to sudden onset loss and damage events such as flooding or cyclones is particularly difficult and hazardous for persons with disabilities who through physical, visual, hearing, intellectual, psycho-social and other impairments, whether mobility, sight, hearing or cognitive, face multiple barriers.

The number of persons with disabilities, currently estimated at 1.3 billion,[73] could double by 2050 with ageing populations.[74] The vast majority (80%) of the poorest live in low- and middle-income countries and are more likely to live in disaster-prone areas where they are two to four times more likely to die in a natural disaster than persons without disabilities.[75] Moreover, persons with disabilities experience poverty at more than twice the rate of persons without disabilities - a risk factor that the Intergovernmental Panel for Climate Change (IPCC) associates with greater climate change vulnerability.[76]

As some of the most disproportionately affected by climate change,[77] persons with disabilities must be prioritised in climate action participation and meaningfully engaged in the design, implementation and responses to sudden-onset climate disasters and slow-onset climate events. This is imperative when it comes to provision for and accessibility to Loss and Damage funding and finance,[78] where the need for vital services for persons with disabilities are a prerequisite to swift, early, at scale, recovery, without which the most marginalised may perish. That provision must ensure there is specific and targeted grant-based participatory funding for people with disabilities, operating on a human rights basis, informed by locally-driven needs, which extends to ensuring representation and participation on the LDF Board.

68 Deji, O.F. (2021). *Gender Implications of Farmers' Indigenous Climate Change Adaptation Strategies Along Agriculture Value Chain in Nigeria.* In: Oguge, N., Ayal, D., Adeleke, L., da Silva, I. (eds) African Handbook of Climate Change Adaptation. Springer, Cham.

69 CBM (2022) *Case study: Nepal's changing climate & its impact on communities including people with disabilities*

70 OHCHR (2020) *Analytical study on the promotion and protection of the rights of persons with disabilities in the context of climate change*

71 UKFCO (2006) *Convention on the Rights of Persons with Disabilities*

72 Human Rights Watch (2022), *Leave no-one behind: People with Disabilities and Older People in Climate Related Disasters*

73 WHO (2023). Disability Factsheet

74 UNDESA (n.d) *Ageing and Disability*

75 UNDESA (n.d) *Disability-inclusive Humanitarian Action*

76 IPCC (2018) *Special Report - Global Warming of 1.5 ºC*

77 CBM (2022) *Case Study – Climate Change and its Humanitarian Consequences: The impact on persons with disabilities in Southern Madagascar*

78 CBM (2023) *Climate Change and Disability Rights*

3.2 Domestic Dividend

We propose, for the economically strongest countries that can step up first, furthest and fastest, that they should devote at least 50% of their CDT revenue to the LDF. Of the remaining 50%, it would be at their discretion as to the percentage they retain as a domestic dividend[79] to invest in the green transformation in their countries. Below we give figures for the domestic dividend set at 50% and at 20% (see section 4.5).

The necessary transition away from fossil fuels has implications for key sectors, regions and countries, which could result in 'stranded workers' and 'stranded communities'.[80] We recommend that revenue from the domestic dividend of the Fossil Fuel State should focus on: i) working with low income communities to help them transition to fossil fuel free transport and energy alternatives; and ii) working with industry bodies, employers, unions and workers, and communities to assist in the transition from fossil-dependent work to alternatives.

The New Climate Economy 2018 report identified that a decarbonised pathway could deliver economic benefits of $26 trillion to 2030 and generate over 65 million new jobs globally[81] - however a conscious focus on justice including rights of workers and of communities, and on representation and engagement with workers and communities, will be essential to achieve the full social benefits.

Just transition for a workforce from high carbon sectors to alternatives: A managed economic transition is about protecting the workers and their communities currently dependent on jobs in high carbon sectors like oil, coal or gas. It does not mean bailing out big energy companies for their stranded investments in fossil fuels.[82] The domestic dividend funds from the CDT should be spent working with communities to provide the education and training and other incentives, to build new industries focused on renewables and other clean alternatives.[83]

Address energy poverty:[84] Across the world, citizens are dealing with a cost of living crisis arising from the increased cost of energy due to the Russian invasion of Ukraine. Increasing costs of fossil fuels disproportionately impacts those on the lowest incomes. Without social programmes the poorest in society will increasingly be forced into energy poverty, particularly affecting the elderly, low-income families, single-parent homes (80% headed by women) and people of colour. Already in the EU, 125 million people (1 in 4 people) live in energy poverty. Governments should direct the domestic dividend from the CDT to reduce energy poverty by undertaking renovation programmes to make buildings, particularly homes of low-income earners, more energy efficient and support community energy programmes, including solar in low-income housing.[85]

Fossil free transport for low-income communities: The best way to ensure that increases in energy costs, were they to arise over time, do not impact low-income households is to ensure that they are not forced to rely on the car in their daily life.[86]

Addressing dependency upon the car will require significant investment in public transport (which needs to be powered by renewables) and in infrastructure to encourage walking and cycling. This has the added benefit of reducing air pollution, noise, road accidents and increasing the health of the community. It can help improve the fabric of society and reduce societal exclusion.[87] Countries should use the CDT domestic dividend funds for spending on infrastructure, in consultation with communities, to make fossil-free transport available, ensuring they focus their efforts on low-income communities, in particular.

79 The idea of the domestic dividend was developed in the original CDT paper on which this section is based: *Stamp Out Poverty (2019). The Climate Damages Tax - A guide to what it is and how it works*

80 Grantham Institute. 2018. Investing in a just transition. http://www.lse.ac.uk/GranthamInstitute/investing-in-a-just-transition/

81 The New Climate Economy: The Global Commission on the Economy and Climate. 2018. Unlocking the Inclusive Growth Story of the 21st Century. https://newclimateeconomy.report/2018/executive-summary/

82 Friends of the Earth Europe. 2018. Just Transition. http://www.foeeurope.org/just-transition

83 For more see: Peter Sheldon, Raja Junankar and Anthony De Rosa Pontello. 2018. The Ruhr or Appalachia? Deciding the future of Australia's coal power workers and communities. IRRC Report for CFMMEU Mining and Energy. October 2018. https://www.ituc-csi.org/IMG/pdf/ruhrorappalachia_report_final.pdf

84 The term 'energy poverty' is also employed in relation to not having access to clean energy, such as dangerous and inefficient cooking systems. In this context, we use the term in respect of the affordability of energy.

85 Friends of the Earth Europe. 2018. Warm homes, not the climate. http://foeeurope.org/energy-poverty

86 Giulio Mattioli, Zia Wadud. Karen Lucas. 2018. Vulnerability ot fuel price increases in the UK: a household level analysis. Transportation Research Part A. 113. p227-242. http://eprints.whiterose.ac.uk/130011/1/1-s2.0-S0965856417304731-main.pdf

87 Carlos Felipe Pardo. 2011. A Guide for Sustainable Urban Development in the 21st Century. United Nations. https://sustainabledevelopment.un.org/content/documents/shanghaimanual.pdf

4 Revenue

4.1 Initial rate

We recommend introducing the CDT in 2024 at a low initial rate of $5 per tonne of CO_2e with a progressive annual ratchet of $5 per tonne. Such a rate is consistent with the literature on carbon pricing, which generally favours simplicity, predictability, and fairness in the design of such policies,[88] including implementation at a modest initial rate increasing over time. Greater detail on the considerations for a general approach to estimating an optimal CDT rate based on available data and assumptions are presented in Annex 2. Particularly in the case of countries and blocs, such a the UK, EU and Japan, at the time of implementation, the scale of CDT revenue would only be symbolic as a contribution to climate finance and domestic just transition. Additional forms of fossil fuel taxation would also need to be introduced to raise the volumes required to deliver finance in line with historic responsibility.

4.2 Increasing the rate over time

Recognising the imperative to phase out fossil fuels by mid-century to avert catastrophic climate change, our approach includes a progressively increasing CDT. This ratchet of the tax rate not only signals the urgency of transitioning away from fossil fuels but also adapts its rate to sustain revenue in accordance with the immediate and deep reductions we need to see in the production and use of fossil fuels, as per the IPCC emission reduction pathways to limit warming to 1.5°C with no or limited overshoot.[89]

As we anticipate a future where the use of fossil fuels is significantly reduced, it is acknowledged that CDT revenues will naturally decrease. This reduction will reflect the successful shift towards renewable energy sources, which will become increasingly cost-competitive as the CDT escalates. Consequently, while the CDT serves as a robust initial funding mechanism for the LDF, we must also explore supplementary sources of finance. These additional streams will be crucial to address the growing needs associated with loss and damage, especially in a landscape where fossil fuels are becoming obsolete.

In this transition from fossil fuels, we need to deploy a diverse portfolio of financial sources. While the CDT, levied at the point of fossil fuel extraction, will initially provide substantial funding for the LDF, the diversification of revenue sources will ensure the resilience and adequacy of funding as we progress towards a fully renewable energy future.

4.3 First, furthest, fastest

Currently, the financial strain of dealing with loss and damage falls primarily on the affected nations and populations, rather than those that have contributed most significantly to causing climate change. To bring about justice for these impacted countries and communities, there is a moral duty to act in accordance with Polluter Pays principle, which also aligns with core principles of the UNFCCC, particularly those of Common-But-Differentiated-Responsibilities and Respective Capabilities (CBDR-RC).

88 Pigato, M. (2019). *Fiscal Policies for Development and Climate Action.* World Bank

89 These pathways and its modelling in this paper can be seen in Annex 3.

In the near future, all nations will need to urgently harmonise their actions with a 1.5°C future, which will necessitate phasing out of all fossil fuels. However, it is particularly those with a historical legacy of pollution, who must go first, furthest and fastest. They should bear the costs of the loss and damage resulting from their legacy of polluting our atmospheric commons. By historical emitters contributing their fair share, it will empower all nations to navigate towards a just and equitable transition, ensuring that no one is left behind in the journey towards a sustainable future.

All Annex 1 parties[90] to the UNFCCC are in the OECD. For ease of grouping, this paper represents historical polluters as OECD member states, a subset of which are Group of 7 (G7) member states. Within the UNFCCC, the OECD represents Annex I and II (which omits OECD economies in transition) Parties. Annex II countries in particular are required to provide financial resources to developing countries for climate action. The OECD member countries account for three-fifths of world GDP and three-quarters of global trade.[91]

This paper presents projections and estimates of CDT revenue for non-OECD, OECD, and the G7 bloc.[92] It is important to note that in the context of loss and damage while there is no obligation for developing countries to contribute, such contributions are encouraged on a voluntary basis.

4.4 Calculating revenue

The source data is the Energy Institute's 72nd Statistical Review of World Energy, 2023.[93] The Statistical Review provides data for OECD and non-OECD countries. In this paper, the data for G7 was derived by grouping G7 countries.[94] Data for Japan was supplemented by data from the US Energy Information Administration.[95] Annex 1 lays out the methodology of how the revenue potential of the CDT has been modelled.

The emissions reductions are based on the IPCC 1.5C targets as seen in table 2 in Annex 1. It is important to note that these numbers are indicative only. It is necessary for the world's most advanced industrial economies to phase out fossil fuels the fastest - and significantly faster than the global level of decarbonisation required under the IPCC 1.5°C scenario. We added an inflation adjustment at 2% per year and assumed a peak of emissions at 2025 as per the IPCC projection. We use tonnes CO_2 equivalent (CO_2e) across the types of fossil fuels. Different fossil fuels emit different amounts of greenhouse gases when burned. For example, coal emits more CO_2 per unit of energy produced compared to natural gas. Therefore, a tax based on CO_2e more accurately reflects the environmental impact of each type of fuel and incentivises against its use. A tax based on CO_2e directly reflects the climate impact of the emissions that ensue from production.

90 List of Parties in Annex 1 of the UNFCCC

91 Within the framework of international climate obligations, the following OECD countries: Mexico, Costa Rica, Colombia, Chile, and the Republic of Korea, are recognised as exceptions as they are considered non-Annex 1 countries. This is important to acknowledge to understand the diverse commitments and responsibilities that vary across different nations within the OECD in the context of global climate initiatives.

92 Figures given for the G7 comprise of numbers for the United States, Canada, Japan, and the United Kingdom with data for Germany, Italy, and France aggregated under a total European Union figure (reflecting the EU's inclusion as a non-enumerated member of the G7).

93 Energy Institute (2023). *72nd Statistical Review of World Energy*

94 OECD includes G7. Noting that the data for G7 included: Canada, Japan, UK, US and the EU.

95 US Energy Information Administration (2023). *Japan Country Analysis Brief*

4.5 Revenue potential

The potential revenue from a CDT that starts at $5 per tonne CO_2e and increases by $5 per tonne annually can be seen in table 1 below.

TABLE 1: $ billion tax revenue at a $5 per tonne CO_2e with $5 per tonne CO_2e annual ratchet applying a 20% and 50% domestic dividend

Year	Global	OECD	OECD LDF Revenue		OECD Domestic Dividend (20%)	G7	G7 Total LDF Revenue		G7 Domestic Dividend (20%)
			with 20% domestic dividend	with 50% domestic dividend			with 20% domestic dividend	with 50% domestic dividend	
2024	216.2	55.8	44.6	27.9	11.2	41.9	33.5	20.9	8.4
2025	436.7	112.6	90.1	56.3	22.5	84.5	67.6	42.3	16.9
2026	580.5	149.7	119.8	74.9	29.9	112.4	89.9	56.2	22.5
2027	685.9	176.9	141.5	88.5	35.4	132.8	106.2	66.4	26.6
2028	759.9	196.0	156.8	98.0	39.2	147.1	117.7	73.6	29.4
2029	808.2	208.4	166.8	104.2	41.7	156.5	125.2	78.2	31.3
2030	835.7	215.5	172.4	107.8	43.1	161.8	129.4	80.9	32.4
2031	891.4	229.9	183.9	115.0	46.0	172.6	138.1	86.3	34.5
2032	935.9	241.4	193.1	120.7	48.3	181.2	145.0	90.6	36.2
2033	970.6	250.3	200.3	125.2	50.1	187.9	150.3	94.0	37.6
2034	996.6	257.0	205.6	128.5	51.4	192.9	154.4	96.5	38.6
2035	1,014.8	261.7	209.4	130.9	52.3	196.5	157.2	98.2	39.3
2036	993.1	256.1	204.9	128.1	51.2	192.3	153.8	96.1	38.5
2037	966.2	249.2	199.4	124.6	49.8	187.1	149.7	93.5	37.4
2038	935.3	241.2	193.0	120.6	48.2	181.1	144.9	90.5	36.2
2039	901.3	232.5	186.0	116.2	46.5	174.5	139.6	87.3	34.9
2040	865.2	223.2	178.5	111.6	44.6	167.5	134.0	83.8	33.5
Totals	**13,793.6**	**3,557.6**	**2,846.1**	**1,778.8**	**711.5**	**2,670.6**	**2,136.4**	**1,335.3**	**534.1**

4.5.1 For OECD countries

In 2024:

- If 20% of the revenue is allocated domestically, the CDT could contribute $44.6 billion to the LDF and $11.2 billion could be used for national objectives that promote a fair and equitable transition.
- If the revenue is split evenly (50% each) between the domestic dividend and the LDF, both would receive $27.9 billion.

In 2030:

- If 20% of the revenue is allocated domestically, the CDT could contribute $172.4 billion to the LDF. Additionally, $43.1 billion could be used for national objectives that promote a fair and equitable transition.
- If the revenue is split evenly (50% each) between domestic objectives and the LDF, both would receive $107.8 billion.

In 2040:

- With a 20% domestic allocation, the CDT would contribute $178.5 billion to the LDF and $44.6 billion for domestic objectives.
- With a 50% allocation for the LDF and the domestic dividend, each would receive $111.6 billion.

4.5.2 For G7 countries

In 2024:

- If 20% of the revenue is allocated domestically, the CDT could contribute $33.5 billion to the LDF. Additionally, $8.4 billion could be used for national objectives that promote a fair and equitable transition.
- If the revenue is split evenly (50% each) between domestic objectives and the LDF, both would receive $20.9 billion.

In 2030:

- The CDT could generate $129.4 billion in revenue. If 20% is allocated domestically, the domestic dividend would be $32.4 billion.
- With a 50% allocation for both domestic objectives and the LDF, each would receive $80.9 billion.

In 2040:

- The LDF's share would be $134 billion, and the domestic share would be $33.5 billion with a 20% domestic allocation.
- With a 50% allocation for both domestic objectives and the LDF, each would receive $83.8 billion.

4.5.3 Cumulative revenue potential

By the end of this decade, according to our estimates the cumulative figure for OECD revenue would be $900 billion. With a 20% domestic dividend this amounts to $720 billion for the LDF and $180 billion domestic allocation for a just and equitable transition. For the G7, it would be $675 billion, which with a 20% domestic dividend allocation amounts to $540 billion for the LDF with $135 billion for domestic climate action.

If applied globally, the cumulative total by the end of the decade would amount to $3,487.4 billion. We provide the global figure, factoring in non-OECD numbers,[96] only to demonstrate revenue potential. It is crucial to note that in the context of loss and damage while there is no obligation for developing countries to contribute, such contributions are encouraged on a voluntary basis.

96 The reason the non-OECD numbers are so much higher than OECD numbers - when the latter are the richest countries with largest fossil fuel extractor, the US - is that they include the OPEC and the BRICS countries, some of the biggest of the world's fossil fuel producers.

Conclusion

At the outset of this paper, we gave the example of the catastrophic floods in Pakistan in 2022, impacting 33 million people and costing an estimated $30.1 billion in losses and damages. Had the LDF been in existence, in 2022, Pakistan would have been able to apply for no-cost funds for its reconstruction and recovery in a timely manner with a considerably better qualitative outcome for a significant proportion of the population.

The LDF is on the cusp of coming into being following political agreement at COP27 and approval of its Governing Instrument at COP28 but for it to be fit for its intended purpose, it needs to be sufficiently resourced. It requires financing at a scale that can respond if another climate event, similar to the events in Pakistan, were to take place again. Unfortunately, given the warming of our planet, that scenario is now, regrettably, inevitable. We, therefore, have no time to lose to establish a fully functioning, sufficiently capitalised, LDF, at the earliest possible time.

This is why the CDT proposal is so timely. It is a powerful means for governments to capture substantial, currently unharnessed, tax revenue from a sector, who have been making excessive profits for decades and whose activities are the root cause of the climate crisis. We propose that the tax receipt does more than boost government income for allocation to the LDF but also offers a domestic dividend that can be spent on climate action nationally, helping to pay for workers to transition away from fossil fuels, towards green energy and transport. We recommend that fossil fuel extracting countries retain 20%–50% for spending on domestic green transformation measures.

The proposal, which is underpinned by the Polluter Pays principle and the principle of Common-But-Differentiated-Responsibilities and Respective Capabilities (CBDR-RC), is a fee on the extraction of each tonne of coal, barrel of oil or cubic metre of gas, calculated at a consistent rate based on how much CO_2e is embedded within the fossil fuel. We recommend that the CDT is introduced at a low initial rate of $5 per tonne of CO_2e, increasing by $5 per tonne each year. Implemented at this rate, the CDT as applied to OECD countries, employing a 20% domestic dividend, would raise $44.6 billion for the LDF in year one, $90.1 billion in year two and $119.8 billion in year three. A significant contribution to the required amounts to adequately resource the LDF.

We urge OECD states, particularly the countries of the G7, to move the first, the furthest, and the fastest in implementing the CDT on their fossil fuel sectors. The CDT is technically feasible and highly desirable, what is required is the political will to make it happen. We call on concerned citizens, organisations and countries across the world to join us in bringing this about.

Annex 1: Methodology

The source data is the Energy Institute's 72nd Statistical Review of World Energy, 2023.[97]

To enable comparability of the fossil fuels we used the UK Government Conversion Factors[98] to convert each unit to kg CO_2e and then to tonnes of CO_2e. The conversion factors for each fuel type are used to convert from the given units to tonnes of CO_2e are:

- Oil production tonnes = 3.229
- Gas: cubic metre (billion) = 2
- Coal: exajoule (converted to tons) = 2270.45

The emission reduction rate utilises a compound annual growth rate based on the IPCC 1.5C targets[99] which suggest CO_2 reduction from 2019 levels by: 2030: 48%; 2035: 65%; 2040: 80%; 2050: 99%.

The emissions are assumed to peak in 2025 and then decrease linearly according to checkpoints. We have assumed a plateau from 2022 levels till 2025.

This can be represented by a function E(t) that gives the emissions in year (t). This function would be piecewise linear, with the slope changing at the years 2030, 2035 and 2040.

The tax revenue in year is given by the equation:

R(t) = E(t) x Tax(t)

where:

R(t) is the tax revenue in year ***(t)***,

E(t) is the emissions in year ***(t)***,

Tax(t) is the tax rate in year ***(t)***,

(and given by the formula as follows: ***Tax(t) = $5 + (Tax (t - 1) x (1 + i))***

The IPCC[100] emission reduction targets are as follows:

TABLE 2: IPCC Greenhouse Gas and CO_2 emission reductions from 2019, median and 5-95 percentiles

Reductions from 2019 emission levels (%)				
Limit Warming to 1.5°C (>50%) with No/ Limited Overshoot	**2030**	**2035**	**2040**	**2050**
GHG Reduction (%)	43 [34-60]	60 [49-77]	69 [58-90]	84 [73-98]
CO_2 Reduction (%)	48 [36-69]	65 [50-96]	80 [61-109]	99 [79-119]

We see the decrease in production starting from the base year of 2022 according to the IPCC checkpoints in figure 5. CDT revenues will fall off as the tax incentives shift from fossil fuels to other energy sources and LDF revenues will need to be replaced by other sources in the basket of measures. It is important to note that the production data is aligned with the 1.5°C phase out pathway, however our use of this data does not represent an endorsement of the underlying assumptions around decarbonisation pathways of different countries.

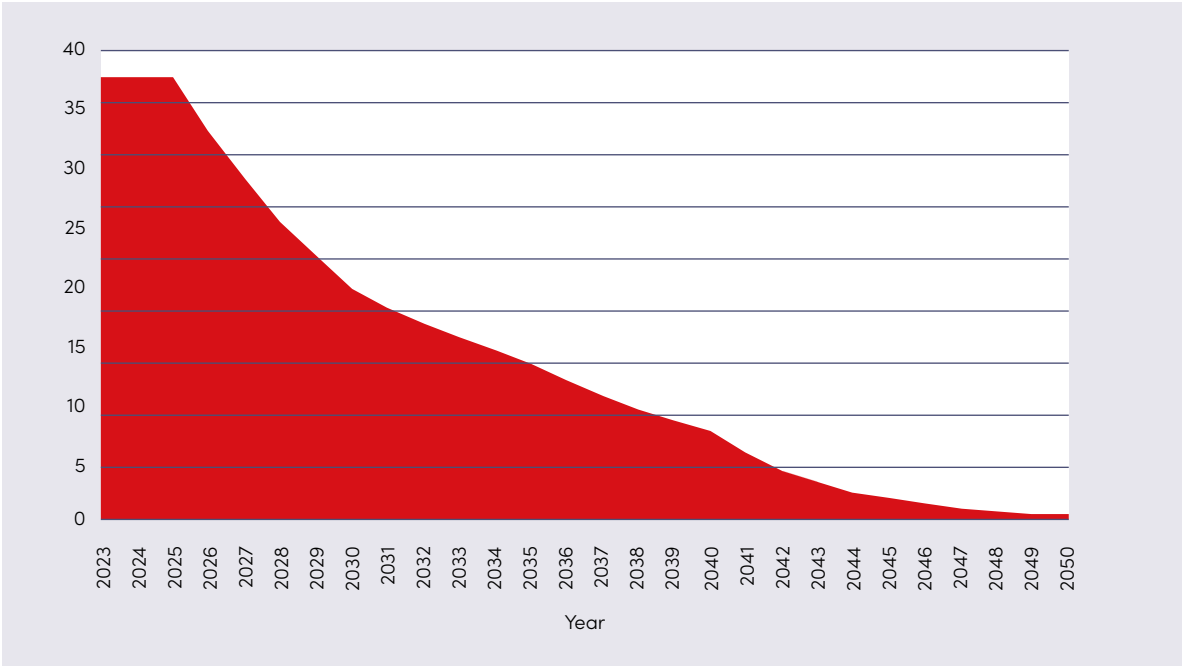
97 Energy Institute (2023). *72nd Statistical Review of World Energy*

98 UK Government Greenhouse Gas Conversion Factors 2022

99 We adopt this pathway aligned with IPCC recommendations as indicative, acknowledging the existence of other viable alternatives.

100 IPCC Sixth Assessment Round Synthesis Report (2023)

FIGURE 5: Decrease in emissions for a 1.5C pathway



We propose a starting rate of $5 per tonne of CO_2e in 2024. Considerations for the establishing of this rate are set out in Annex 2. To summarise, in our model we set out an increase of $5 annually consistent with the need to transition from fossil fuels and approaching the social cost of carbon whilst minimising distributional impacts. The Social Cost of Carbon (SCC) is based on Rennert et al's[101] mean estimate of $185 per tonne of CO_2 ($44–$413 per tCO_2: 5%–95% range, 2020 US dollars) at a near-term risk-free discount rate of 2%. However to minimise the risk of distributional impacts of such a large rate we propose a ratcheted approach to the SCC to 2050. As such, the tax rate starts at $5 per tonne CO_2e in 2024 and increases by $5 per tonne CO_2e every year. This can be represented by a function:

$$Tax(t) = \$5 + (Tax\ (t - 1) \times (1 + i))$$

where ***(t)*** is the year. Therefore:

Tax(t) = Tax amount at time

t = year

i = inflation rate in %

Adjusted for inflation, the rates are as follows for the interim reduction targets.

- 2024: $5 per tonne CO_2e
- 2025: $10.2 per tonne CO_2e
- 2030: $37.8 per tonne CO_2e
- 2035: $68.3 per tonne CO_2e
- 2040: $101.9 per tonne CO_2e
- 2050: $180.1 per tonne CO_2e

101 Rennert, K., Errickson, F., Prest, B. C., Rennels, L., Newell, R. G., Pizer, W., ... & Anthoff, D. (2022). Comprehensive evidence implies a higher social cost of CO_2. *Nature*, 610(7933), 687-692.

Annex 2: Considerations for setting the tax rate

In respect of setting the tax rate, Carattini, Carvalho, and Fankhauser (2017)[102] argue in their paper 'How to make carbon taxes more acceptable', that the level of the tax can significantly impact its acceptability. Higher tax rates are generally less acceptable to the public. This suggests that the CDT proposal should consider the public's attitudes towards the tax rate in its design. While the tax rate should still reflect the damages caused by carbon emissions, it may also need to be adjusted to increase its acceptability. Furthermore, the authors found that attitudes towards carbon taxes can change over time. This indicates that ongoing public education and awareness campaigns about the impacts of climate change and the role of the CDT in mitigating these impacts could help increase the acceptability of the tax over time.

One way in which the tax rate could reflect the damages caused by carbon emissions is the Social Cost of Carbon (SCC). The SCC measures the monetised value of the damages to society caused by an incremental metric tonne of CO_2 emissions.[103] Note that whilst this is a cost on emissions and not extraction it can serve as a starting point for the CDT rate as the cost of not keeping fossil fuels in the ground. According to the U.S. Environmental Protection Agency, the central estimate of the SCC is $51 per metric ton of CO_2 in 2023, whilst Schultes et al. (2021)[104] argue that the current pathways towards limiting global warming do not consider the climate impacts already occurring below 2°C. Their research shows that accounting for such damages significantly increases the near-term ambition of transformation pathways, leading to an optimal carbon price of $115 per tonne of CO_2 in 2030. A highly cited recent paper by Rennert et al (2022)[105] utilises a mean estimate of $185 per tonne of CO_2 ($44–$413 per tCO_2: 5%–95% range, 2020 US dollars) at a near-term risk-free discount rate of 2%. Their model utilises probabilistic SC-CO_2 estimates from the Greenhouse Gas Impact Value Estimator (GIVE), which is a newly created integrated assessment model (IAM) designed for quantifying the benefits of emission reductions and solves some of the issues that have arisen in IAMs.

The immediate application of a $185 per tonne of CO_2e tax rate would however have considerable distributional impacts. As such, and following the principles below, we propose a ratcheted approach to the SCC to 2050. Such an approach proposes beginning with a rate of $5 per tonne of CO_2e in 2024 with an annual increase of $5 per tonne of CO_2 adjusted for inflation at 2% each year.

The following considerations can be applied in the design of an optimal rate:

- **Equity:** Developed countries ought to go the first, furthest and the fastest in respect of contributing to the LDF. As a means to incentivise the participation of rich countries, the domestic dividend component of the CDT proposes that a portion, between 20-50%, is allocated to pay for the necessary transition away from fossil fuels, towards green energy and transport with the remainder devoted to responding to loss and damage via the LDF, particularly in marginalised and low-income communities.
- **Public acceptance:** As discussed in the Carattini, Carvalho and Frankhauser paper cited above, the level of the tax can significantly impact its acceptability. If a high tax rate is likely to be unacceptable to the public, it may be necessary to start with a lower rate and gradually increase it over time.
- **Impact on the economy:** The rate might need to be adjusted based on the specific economic context. This would include the various shocks the global economy is currently facing in addition to the climate emergency, such as the Russian invasion of Ukraine and its resultant impact on the cost of living, particularly on food and energy prices.

102 Carattini, S., Carvalho, M., & Fankhauser, S. (2017). *How to make carbon taxes more acceptable.* London: Grantham Research Institute on Climate Change and the Environment, and Centre for Climate Change Economics and Policy, London School of Economics and Political Science, 57

103 Rennert, K., Errickson, F., Prest, B. C., Rennels, L., Newell, R. G., Pizer, W., ... & Anthoff, D. (2022). Comprehensive evidence implies a higher social cost of CO2. *Nature,* 610(7933), 687-692.

104 Anselm Schultes et al (2021) Economic damages from on-going climate change imply deeper near-term emission cuts. E*nvironmental Research Letters,* 16 104053 https://iopscience.iop.org/article/10.1088/1748-9326/ac27ce/pdf

105 Rennert, K., Errickson, F., Prest, B. C., Rennels, L., Newell, R. G., Pizer, W., ... & Anthoff, D. (2022). Comprehensive evidence implies a higher social cost of CO_2. *Nature,* 610(7933), 687-692.

- **Adjust for inflation:** The CDT rate should be adjusted for inflation to maintain its real value over time.[106] This adjustment could take place annually or implemented every few years.
- **Review and update regularly:** The CDT rate should be reviewed and updated regularly to ensure that it continues to reflect the estimated damages caused by the production of fossil fuels.

The impact of the CDT cannot be fully captured by a single number such as $5 per tonne CO_2e increasing linearly by a $5 per tonne CO_2e each year. It is important to note that the design of the tax, including how the revenue is used and how the tax interacts with other policies, can significantly influence the amount of revenue that will be captured.

Requirements of just and equitable climate finance

The CDT, applying the Polluter Pays principle and pooling revenue internationally towards the public good of addressing loss and damage, aligns with the requirements of just and equitable climate in the following ways:

- **New and additional:** As per the Copenhagen Accord in 2009 and reaffirmed in the Cancun Agreement in 2010 and the Paris Agreement which notes the 'mobilisation of climate finance should represent a progression beyond previous efforts'.[107]
- **Adequate and precautionary:** Corresponding to loss and damage finance needs[108] and precaution to limit temperature increase. Also precautionary in not delaying the swift disbursement of funds to loss and damage-impacted communities.
- **Predictable:** Regular finance flow that can enable planning for long-term restorative action.[109]
- **Rights-based:** Countries have broad obligations to prevent transboundary harms. States have a duty to mitigate climate change under international environmental treaties and under international human rights law to respect, protect, and fulfil the human rights of populations, wherever they may be.[110]

106 This could be done using the consumer price index or another measure of inflation which according to the IMF was 6.1% in the first quarter of 2023. A very simplified calculation would be as follows: Adjusted Value = Original Value * (1 + Inflation Rate).

107 Mitchell, I., Ritchies, E., & Tahmasebi, A. (2021) *Whose Climate Finance is "New and Additional"?*. Centre for Global Development

108 Schalatek, L., & Bird, N. (2023) *The Principles and Criteria of Public Climate Finance - A Normative Framework* https://climatefundsupdate.org/wp-content/uploads/2023/03/CFF1-2023-ENG-Normative-Framework.pdf

109 Ibid.

110 OHCHR (2021) *Frequently Asked Questions on Human Rights and Climate Change*

Annex 3: Alternative base rates

In Annex 2, we identified an optimal CDT rate of $5 per tonne CO_2e with an annual ratchet of $5 as the most balanced approach, offering significant revenue potential both nationally and internationally. This rate is projected to strike a prudent balance between incentivising emissions reductions and generating substantial revenue without being overly burdensome.

However, to cater to different economic and environmental scenarios, we also explore alternative base and ratchet rates. The revenue potential of the CDT under varying rates is presented in Table 3. This exploration can allow us to understand how sensitive our revenue projections are to changes in the tax rate.

By presenting these alternatives, we aim to illustrate the scalability and adaptability of the CDT.

Without an annual ratchet the total revenue raised via a static $5 per tonne CO_2e tax rate in 2030 by the OECD and G7 would be $96 billion and $72.1 billion respectively. Non-OECD revenue would be $276.3 billion.

For the same year, a $10 per tonne CO_2e base rate with a $5 per tonne CO_2e annual ratchet would result in a total OECD revenue of $311.6 billion, a G7 revenue of $233.9 billion and non-OECD revenue of $896.5 billion.

In 2030, applying a $15 per tonne CO_2e base rate with a $5 per tonne CO_2e annual ratchet would result in a total OECD revenue of $407.6 billion, a G7 revenue of $306 billion and non-OECD revenue of $1172.8 billion in 2030.

It is important to note that in the context of loss and damage while there is no obligation for developing countries to contribute, such contributions are encouraged on a voluntary basis.

TABLE 3: Revenue potential at alternative base rates

		$5tn CO_2e, no ratchet	$10tn CO_2e, annual increase by $5tn CO_2e	$15tn CO_2e, annual increase by $5tn CO_2e
2024	OECD	55.8	111.5	167.3
	Non-OECD	160.4	320.8	481.3
	G7	41.9	83.7	125.6
2025	OECD	112.6	225.3	337.9
	Non-OECD	324.1	648.1	972.2
	G7	84.5	169.1	253.6
2030	OECD	96.0	311.6	407.6
	Non-OECD	276.3	896.5	1172.8
	G7	72.1	233.9	306.0
2035	OECD	71.4	333.1	404.5
	Non-OECD	205.4	958.4	1163.8
	G7	53.6	250.0	303.6
2040	OECD	45.0	268.2	313.2
	Non-OECD	129.6	771.6	901.2
	G7	33.8	201.3	235.1
2045	OECD	11.1	79.2	90.3
	Non-OECD	32.0	227.8	259.8
	G7	8.3	59.4	67.8
2050	OECD	2.7	22.5	25.2
	Non-OECD	7.9	64.6	72.5
	G7	2.1	16.9	18.9
Total		6136.2	22855.2	28991.4

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