

Beyond universal health coverage and proactive climate resilience measures, both climate change adaptation and pandemic preparedness can be framed as part of countries' legal obligation to realize the right to health through their laws, policies and budgets. Under international human rights instruments, such as the International Covenant on Economic, Social and Cultural Rights (1966), countries have obligations to respect, protect and fulfil the right to health, including taking steps to prevent epidemic disease¹⁴. There is increasing recognition that addressing climate change is a component of realizing the right to health: the Paris Agreement acknowledges that in taking action to address climate change, countries should consider, respect and promote their obligations on the right to health. Robust global cooperation and governance with a human rights-centred approach — supported by appropriate legal and institutional frameworks — is a prerequisite for successfully confronting these multi-dimensional, overlapping challenges with integrated solutions. □

Carly A. Phillips¹ , Astrid Caldas¹ , Rachel Cleetus¹, Kristina A. Dahl¹, Juan Declet-Barreto¹, Rachel Licker¹, L. Delta Merner¹, J. Pablo Ortiz-Partida¹ , Alexandra L. Phelan², Erika Spanger-Siegfried¹, Shuchi Talati¹, Christopher H. Trisos^{1,3,4}  and Colin J. Carlson^{1,2} 

¹Union of Concerned Scientists, Cambridge, MA, USA. ²Center for Global Health Science and Security, Georgetown University Medical Center, Washington D.C., WA, USA. ³African Climate and Development Initiative, University of Cape Town, Cape Town, South Africa. ⁴Centre for Statistics in Ecology and the Environment, University of Cape Town, Cape Town, South Africa.

✉e-mail: cphillips@ucsusa.org; colin.carlson@georgetown.edu

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Climate-related financial disclosures in the public sector

Expectations for the Task Force on Climate-related Financial Disclosure's framework to drive climate action in the private sector are high, and there is growing interest in its relevance for guiding public sector climate action. However, consideration of the framework's limitations is critical prior to public sector application.

Ian Edwards, Kiri Yapp, Sam Mackay and Brendan Mackey

A Task Force on Climate-related Financial Disclosures (TCFD) was established by the G20's Financial Stability Board on the premise that more complete and consistent disclosure of climate-related risks would encourage better decision-making and risk management by entities, resulting in a more stable financial system¹. The expectation is that disclosure by entities of their climate-related financial risks will enable the collective market to incorporate such risks into pricing decisions, in turn imposing the market discipline needed to transition towards achieving low carbon and climate-resilient targets.

The TCFD released its final recommendations in June 2017, to widespread attention and support. Premised on the disclosure of four core

elements — governance, strategy, risk management, and metrics and targets — the TCFD recommendations extend existing frameworks by recommending disclosure of material climate-related risks, risk governance and management processes, and resilience of the business strategy under different climate-related scenarios. By February 2020, the TCFD had drawn over 1,037 proclaimed supporters, including NGOs, corporations and stock exchanges².

Government support of the TCFD recommendations has predominantly taken the form of financial regulator endorsement and consideration of associated regulation for their use in private sector disclosures, and considering regulation for the same. However, this support has extended to consideration of the framework's

application to the public sector itself. For example, the city of Vancouver included TCFD-aligned disclosures in its 2018 annual financial report as one mechanism for mainstreaming climate risk considerations into the city's processes. Further, legislation introduced by the New Zealand government in 2019 compels organizations, including the public service and local authorities, to provide disclosures on climate change adaptation consistent with the core elements of the TCFD.

While the uptake of the TCFD among both regulators and businesses represents positive progress on climate action, application of the framework without consideration of its limitations risks suboptimal results for the private and public sectors alike.

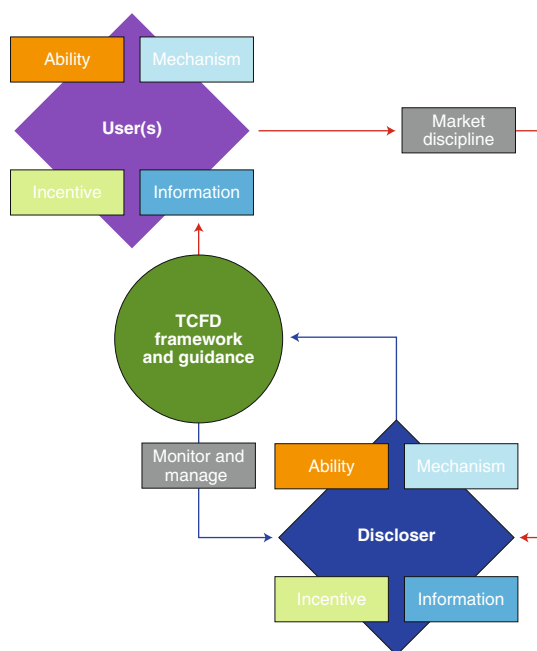


Fig. 1 | Prerequisites of TCFD catalysation of market discipline and internal management. The TCFD framework and associated guidance create a circular relationship between discloser and user(s). Where suitably incentivized, able disclosers with access to requisite information and mechanisms generate climate-related information per the TCFD framework. Such information forms the basis of internal monitoring and management of discloser climate risk. It also enables the users of such information, where suitably abled and incentivized, to act as a collective market mechanism to generate the market discipline required to incentivize disclosers to internally monitor and manage climate risk and disclose climate risk.

Disclosure and market discipline

The potential of the TCFD to catalyse market discipline as well as monitor and manage climate risk within the private sector is influenced by the nature and operating conditions of disclosers and users of disclosures (Fig. 1). Market discipline broadly refers to the pressure that free markets exert on all market participants (including users and disclosers); for example, via cost of debt and equity to operate in a financially stable manner³. It operates in the absence of direct government intervention and is contingent on four prerequisites: information, ability, incentive and mechanism⁴.

Figure 1 depicts that of the four prerequisites of market discipline, only information is directly linked to the TCFD framework. While the TCFD framework can influence the nature of information disclosed, it has no direct influence over the degree to which, and how appropriately, such information is used. The ability and incentive of users to interpret and apply climate-related disclosures, and the mechanisms available to them for doing so, are influenced by a much broader set of societal and economic challenges than

those encompassed within the direct influence of the TCFD (Table 1). That the success of the TCFD framework so heavily relies on three prerequisites, which exist largely independent of its influence, forms a common basis for scepticism of the framework's potential. In addition, the prerequisites in Table 1 are as applicable to the production of information as they are to its application. As such, the quality and usability of information disclosed is not only reliant on the efficacy of the TCFD framework, but also on the ability and incentive of entities to disclose in accordance with it.

Efficacy of disclosure

The question therefore remains as to whether disclosure motivates accurate and informative reporting by entities and subsequent behavioural changes, and whether such changes can be achieved in the public sector. The results of empirical research on the capacity of related, albeit more broadly applied, disclosure frameworks (for example, corporate social responsibility and the EU's non-financial reporting directive) indicate that critical factors for disclosures to compel market and

entity-specific behaviour include mandatory adoption⁵, third-party assurance of accuracy and relevance⁶, stakeholder power to enforce compliance and punish poor practice³, and detailed guidance of both how to prepare and interpret reports⁷.

With the exception of stakeholder power, these factors have experienced various degrees of adoption. The TCFD recommends disclosures are made within mainstream financial filings, exposing them to consistent quality and assurance procedures. While stipulated as a voluntary framework when published, initiatives such as the UK's Green Financing Strategy have opted for mandatory application of the framework, and a stream of guidance material has emerged from both civil and business initiatives. While these are positive steps, it is highly likely that the time required for the TCFD framework to mature to a point necessary to produce the consistent, quality information required to effectively drive both market and firm behaviour will exceed the short time society has to act to mitigate the worst impacts of climate change⁸.

Relevance to the public sector

The allure of the TCFD to government is unsurprising. Since the 1980s, public sector reforms in many western democracies have seen the adoption of business-like practices premised on deliberate exposure of service provision to open market competition and a focus on risk management, among other things⁹. Faith in the market and an emphasis on performance evaluation as integral to efficient and effective organizational management^{10,11} are consistent with the underlying assertions of the TCFD. For governments, climate risk disclosure could demonstrate leadership and influence other sectors¹², meet growing stakeholders' interest and account for their public responsibilities¹⁰, and gain a competitive advantage over other jurisdictions¹³.

Disclosure of climate risk is also increasingly becoming a prerequisite to minimize borrowing costs. Evidence has emerged of investors demanding higher costs from municipalities with greater exposure to climate risks¹⁴ as well as a heightened willingness and capability among credit rating agencies to incorporate climate risk and disclosure in ratings¹⁵.

Beyond its obvious relevance to borrowings, the application of the TCFD to broader government policy is not so apparent. While reforms have blurred the lines of public and private sector entities, the broader motive of government to balance economic, environmental and social expectations beyond a primary profit motive remains⁹. Such broad expectations are

Table 1 | Challenges climate change creates for market discipline and disclosure prerequisites

Prerequisites		Challenges	
Type	Description	User(s)	Discloser
Information	Sufficient information to make informed decisions.	Dependent on ability and incentive of discloser and discloser's supply chain to provide sufficient information.	Availability of organizational data, including provision of downstream information by supply chain entities.
Ability	Capacity to process and/or disclose ^a information accurately.	Uncertainty inherent in climate risk, where future has little resemblance to the past significantly hinders capacity to assess and price ²¹ . Lack of methodologies and data severely hampers identification of long-term, non-linear, non-cyclical risks, such as those presented by climate change ²² . Lack of transparency and quality assurance of climate service technologies risks misapplication of outputs and dissemination of inaccurate results ²³ .	
Incentives	Motivation to use and/or disclose ^a information.	Short holding periods of equities and bonds by investors creates little incentive for analysts to undertake long-term risk analysis required to both identify and price climate risks ²² .	Legitimization motives result in incomplete and biased disclosures ²⁴ . Room to move or interpret, inherent in the likes of voluntary and broadly framed guidelines, allows reporters to not only cherry-pick indicators supportive of legitimacy and reputation motives ⁷ , but also to avoid issues that may draw unwanted attention ²⁵ .
Mechanisms	Requisite tools and powers to exercise market discipline and/or supply chain compliance ^a .	Absence of some form of regulation that economically punishes suboptimal behaviour ²⁶ . Herd mentality, so evident in the financial sector, whereby many participants blindly follow as opposed to undertaking their own independent analysis, risks amplifying inaccuracies and stifling market forces ²¹ .	Lack of purchasing power to influence supply chain behaviour typical in smaller organizations and lack of awareness among suppliers ²⁷ .

^aOf the four prerequisites to market discipline identified by Crockett⁵, the description of these three (ability, incentives and mechanisms) have been adapted specific to the production and disclosure of information. Note that the description of the first, information, remains unchanged, as the description already captures the prerequisite's relevance to both market discipline and information production and disclosure.

inconsistent with the much stricter financial intent of market discipline, which the TCFD seeks to enable. Indeed, the inclination of markets to discriminate purely on financial terms risks decisions and actions devoid of public good and/or consideration of those most exposed and vulnerable to climate risk¹⁶. A wide array of non-financial climate risks cannot be robustly measured in monetary units, and applying such a financial lens would, in many cases, lack relevance to the broader array of stakeholders to whom government is accountable⁸.

However, the generic nature of the TCFD framework's core elements facilitates a broader application. Governance, strategy, risk management as well as metrics and targets are as equally relevant to the non-financial roles and responsibilities of the public sector as they are to the financial

objectives of the private sector. Similarly, components of the process recommended by the TCFD, including identifying climate-related risks and opportunities as well as the undertaking of scenario analysis, may have applicability to public sector activities.

While extending core elements of the TCFD framework to the provision of public services represents an interesting proposition, the challenges that impede the effective production and application of climate risk disclosure remain. Additionally, the relevance of market discipline for government behaviour is minimal, meaning that subsequent actions would be largely dependent on the diffuse powers of generic society as opposed to the more focused attention of market participants¹⁰. The broader responsibilities that such accountability implies and the

sheer disparity of interested stakeholders impede the production of understandable relevant information. Even where this is achieved, the preoccupation of policymakers with economic growth and the interests of well-organized detractors severely constrains the efforts of concerned stakeholders to force government accountability and action¹⁷.

Public sector application

Government has historically struggled to adopt the innovative solutions at the cross-organizational scale needed to address pervasive and pressing issues, such as climate change^{11,18}. A failure to incorporate the workings of bureaucracies and their impact on decision-making and policy formulation risks underestimation of the complexity and challenges inherent in public policy implementation¹¹. Climate policy expertise gaps and the vagaries of politics often magnify these complexities^{19,20}. Policy formulation without due regard to these factors is likely to fail.

This is especially relevant to the TCFD, where the mechanism's focus is on providing transparency and information to compel implementation of climate action as opposed to addressing the technicalities of implementation itself. It is apparent that the TCFD cannot reduce climate risk in isolation. Rather, various prerequisites must be met beyond the structure of the TCFD framework if information of catalysing quality is to be both produced and applied.

Expectation of the TCFD's power to address climate risk which fails to appreciate the aforementioned prerequisites risks not only suboptimal results, but could deflect attention and scarce resources away from other potentially more effective and direct mechanisms. As such, the efficacy of a TCFD framework for government turns not only on the potential of the framework itself, but also where this fits within the broader scope of climate policy. This is not to say that application of the TCFD to government is without merit and potential benefit. Rather, an understanding of the TCFD's strengths, limitations and dependencies in the context of public sector traits and challenges will ensure that any implementation, balanced as part of a broader portfolio or otherwise, maximizes its contribution. □

Ian Edwards ¹, Kiri Yapp², Sam Mackay ¹ and Brendan Mackey³

¹Griffith Climate Change Response Program, Griffith University, Nathan Campus, Brisbane, Queensland, Australia. ²Climate Change and Sustainability Services, Ernst & Young, Brisbane, Queensland, Australia. ³Griffith Climate Change Response Program, Griffith University, Gold Coast Campus,

Brisbane, Queensland, Australia.

✉e-mail: ian.edwards@griffith.edu.au

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Competing interests

K.Y. has contributed to this commentary in her own capacity, and any views expressed in this Comment are her own and not those of Ernst & Young. K.Y. is an employee of Ernst & Young who provides climate and sustainability services to public and private sector entities, including in relation to climate risk disclosure.



Adjust urban and rural road pricing for fair mobility

Synergistically addressing local and global environmental damages rather than optimizing a specific aspect of the policy conundrum helps to effectively foster climate action in road transport while maintaining public acceptance and socially fair outcomes.

Felix Creutzig, Aneeqe Javaid, Nicolas Koch, Brigitte Knopf, Giulio Mattioli and Ottmar Edenhofer

Decarbonizing the transport sector is widely seen as a huge challenge for climate policy making. In some developed countries, emissions from the electricity sector have started to decline, but transport emissions have stalled or even increased. Transport climate policy has so far been treated as technological regulation in terms of fuel efficiency standards, more recently combined with non-binding adoption goals for electric vehicles. While relevant, such measures alone remain inconsistent with the ambition of the Paris agreement, are compromised by both rebound and leakage effects, and are subject to gaming by the automobile industry. As an alternative, fuel taxes have been identified as a key and effective strategy¹, and economists and other academics hence persistently argue in favour of pricing strategies, such as carbon or fuel taxes. Carbon pricing puts a price tag on contributing to dangerous climate change, installs the polluter pays principle and incentivizes the reduction of GHG emissions. Politically, however, this strategy is risky. A fuel price increase was recently tested in France and met a huge

Table 1 | Differentiating pricing of road transport to address environmental and social costs of car use

	Geographical differentiation	Other differentiation
Carbon price	No	Fuel
Congestion charge	Yes	Time
Pollution charge	Yes	Fuel and vehicle

backlash, as signified by the ‘yellow vest’ protests². How then can policy makers effectively address GHG emissions in road transport without eliciting social protests and adversely affecting the socially vulnerable? Here, we argue that a geographically differentiated point of view, respecting both the location-specific environmental costs of road transport, such as congestion and local air pollution, and the opportunities of modal shift, offers a way out of this dilemma (see ref. ³). Underlying this argument is recent evidence demonstrating that (1) fuel and road pricing have heterogeneous distributional consequences across geography; (2) car transport has higher

external costs in dense urban settings, reflecting both congestion and air pollution, compared to rural areas; and (3) fuel and road pricing have a stronger steering effect in urban settings, as public transit and short distances enable a modal shift to alternatives (see sub-section titled ‘Easier adjustment for urbanites’ below and Fig. 1). Together, these insights strongly point to the need for differentiated pricing of car-related externalities across geographical settings. To further improve social acceptability and fair outcomes, we propose that revenues raised are spent impartially and used to improve the infrastructure of environmental modes, especially in sub- and peri-urban settings.