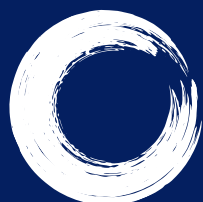


**INCENTIVISING  
PROJECT-LEVEL  
CLIMATE  
DISCLOSURE:  
A WAY  
FORWARD FOR  
HYDROPOWER  
CLIMATE  
ACTION**



**OPEN  
HYDRO**

September 2021

## Purpose

We live in a time of climate emergency. However, we are not powerless in the face of this global threat. As the UN Secretary-General António Guterres said, “the climate emergency is a race we are losing, but it is a race we can win”.

This paper calls upon the hydropower sector to advocate for a commonly agreed climate-related reporting and disclosing mechanism for hydropower assets as the way forward to speed up in this race. It sets out the ground to identify and assess the need for hydropower industry specific recommendations, metrics and targets to disclose climate-related information requested by investors, lenders or policy-makers.

## Executive Summary

After five years of the Paris Agreement, UN Secretary-General António Guterres called on leaders to declare a State of Climate Emergency until reaching carbon neutrality. The Intergovernmental Panel on Climate Change (IPCC) states global emissions must be halved by 2030 and reach net zero by 2050 to avoid climate catastrophe.

In addressing the global challenges we face, including climate change, water and energy access, hydropower assets have an unprecedented transformational role.

Besides affordable, reliable, and renewable energy, hydropower provides a double benefit in the fight against climate change. It contributes to climate change mitigation and climate adaptation. On the one hand, hydropower has significantly lower lifetime greenhouse gas (GHG) emissions than most technologies. On the other hand, hydropower increases climate resilience in the systems in which they are located by providing flood and drought control and supporting the integration of variable renewable sources. However, hydropower assets are also vulnerable to climate change. Investing in projects' climate resilience will reduce economic costs in the long term but needs action now.

Global initiatives are emerging to improve and increase disclosure of ESG and climate-related information, as development and financial institutions put greater attention to investment in disaster risk management and climate change adaptation. Several initiatives and frameworks, such as the Task Force on Climate-Related Financial Disclosure (TCFD) recommendations, the European Union's Sustainable Finance Disclosure Regulation and the Climate Disclosure Standards Board, are calling for an urgent scale-up of climate and ESG disclosure.

Climate-related information becomes increasingly critical to efficiently direct capital to investments that drive climate change mitigation and adaptation solutions. To better demonstrate hydropower's contribution, the sector needs to develop better capabilities to identify, assess, and report climate-related risks and opportunities. Specific industry guidance is necessary to report physical and transition risks and opportunities that arise from climate change aligned with the global recommendations and criteria.

This white paper analyses the trends around climate risk disclosure worldwide, covering the challenges and opportunities for hydropower. It studies and compares TCFD recommendations with international taxonomies and finds an emerging need for standardised metrics and industry-specific reporting standards. It also presents the insights gained from a survey to understand the impacts of climate resilience and adaptation reporting to unlock climate finance for hydropower assets. To conclude, it suggests ways forward for downscaling commonly-agreed climate-related reporting to the hydropower-specific project level.

## The challenge

### Introduction

Hydropower is a clean, renewable, and reliable source of energy. It produces 4,306 TWh a year, corresponding to about 16% of the world's generated electricity and over 60% of renewable electricity generation.<sup>1</sup>

Hydropower provides a double benefit to fight against climate change. The first benefit is its contribution to climate change mitigation. Hydropower not only provides clean energy with significantly lower lifetime greenhouse gas (GHG) emissions than most other technologies,<sup>2</sup> it also supports the increased integration of variable renewable sources through its flexibility services. Therefore, it reduces our reliance on fossil fuels, avoiding four billion tonnes of additional GHG emissions per year versus coal-fired generation, according to IHA's 2020 Hydropower Status Report.<sup>3</sup> The second benefit is hydropower's ability to provide water services and act as a storage buffer against climate change, or in other words, its contribution to climate adaptation. Hydropower provides water storage capacity for electricity generation, irrigation, drinking water, flood control, navigation, and other services. Increasing water storage capacities is imperative to adapt to a warmer world and meet growing water demand.

Hydropower holds a dual relationship with climate change. Besides its role in climate adaptation and mitigation, hydropower assets are already starting to experience the impacts due to climate-related risks. Water availability and hydropower generation are affected by changes in hydrological patterns

and extreme weather events and will continue facing these climate-related risks in the future. Climate change is likely to alter river discharge, impacting water availability and hydropower generation. Planning hydropower systems from a long-term, climate-resilient perspective will ensure that future generations inherit infrastructure that will not be compromised by climate change, ensuring that operations are not compromised in the long term.

The ageing dam landscape faces new temperature, snow, discharge, and flood patterns that increase hydrological failure risk. New dam release operations will require to maintain historical levels of flood protection in the face of climate change. Studies project flood risk to increase in the future due to climate change and population growth. The Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) informs that the number of people exposed annually to the equivalent of a historical 100-year river flood will triple comparing the high to low emission scenario. A study shows that ignoring flow regulation by dams, flooding downstream could affect between 9.1 and 15.3 million people per year.<sup>4</sup>

Climate-induced future changes follow the spatial pattern of increases and decreases of mean annual runoff (MAR). MAR is projected to increase by more than 10% on 50% of the global land area by the 2050s.<sup>5</sup> However, the study found important differences at the sub-basin level, where downstream reaches of major rivers often show an opposite sign of change with respect to MAR and mean annual discharge.

## Mobilising capital

The World Economic Forum has found that the major global risks facing the world today are extreme weather events, natural disasters, failure of climate change mitigation and adaptation.<sup>6</sup> A growing number of large institutional investors are incorporating Environmental, Social and Governance (ESG) including climate-related metrics into their capital allocation. Reporting on an array of new ESG metrics for their portfolio companies might become mandatory following the European Union's Sustainable Finance Disclosure Regulation (SFDR).<sup>78</sup> Nonetheless, ESG investments face some challenges:

- Uniform ESG data from companies.
- Agreed upon definitions.
- Capacity required to set up ESG funds.
- Consumer demand in some markets.
- Understanding the past of the reporting entity.

Climate-related information is a critical contributor to efficiently directing capital to investments that drive climate change mitigation and adaptation solutions. Providers of capital require information on the risks and opportunities companies face due to climate change and how they contribute to or help mitigate climate change impacts to make well-informed financial decisions.<sup>9</sup>

## Climate finance

Climate finance can support the financing and refinancing of hydropower assets which are compatible with a low-carbon future. Refinancing hydropower operating projects

allows them to benefit from a good debt market environment.

*"The race to resilience has begun.  
We need to point it towards  
the trillions of funds."*

*Emma Howard Boyd, Global Center on Adaptation*

Climate finance is a subset of green finance where the capital is allocated to projects with positive environmental outcomes labelled as "green". Climate bonds address the investor's concerns about the green project's climate-related risks. However, in practice, green projects are also climate change projects, and these terms, green and climate, are used interchangeably.

After years of consecutive growth since its inception, green finance grows relentlessly, hitting the total cumulative \$1 trillion milestone in 2020. However, it must surpass the annual \$1trillion in green investments in the next decade to achieve net-zero carbon goals. The green market recorded \$269.5 billion of issuance in 2020. Of those, with the largest share, the energy sector received \$93.6 billion.<sup>10</sup>

Since 2018, a new loan instrument for funding green projects - including renewable energy projects - exist, the green loans. They follow the Green Loan Principles, which provide a high-level framework, agreed by leading financial institutions and these build on and refer to the Green Bond Principles.<sup>11</sup>

Yet, only a small fraction of the green bonds market addresses the climate impacts and invests in resilience and adaptation. EBRD's \$700 million climate resilience bond set a landmark issuing the first green bond dedicated entirely to climate resilience in 2019.<sup>12</sup> Given the market gap, the Global

Centre for Adaptation (GCA) in collaboration with EBRD will delve into the opportunities and barriers to scale up the market. A report is due at the beginning of 2021 together with a guidance for issuers of green bonds for resilience.<sup>13</sup> Though these reports will set up a good foundation, there will be a large gap for industry specific guidance on, for example, how to access the market or impact reporting.

At the Climate Adaptation Summit 2021, under the UNEP Finance Initiative and GCA's lead, financial stakeholders committed to a scale-up of private finance to build a climate

#### WORLD BANK RESILIENCE RATING SYSTEM

The World Bank has created a resilience rating system to prioritize and promote investments that support transformation as they relate to current and long-term climate impacts. The system demands enhanced transparency and more specific disclosure with the aim to:

- Better inform decision-makers, investors, and other stakeholders on the resilience of projects and investments.
- Create incentives for more effective climate adaptation.
- Distinguish best practices as an example of resilience to be scaled up.
- Guide project developers to manage climate risk.

resilient future. Through greater disclosure, the trend to green

finance will scale up. Supporting the physical risks and resilience statement, Emma Howard Boyd from GCA, said, "The

race to resilience has begun; we need to point it towards the trillions of funds."<sup>14</sup>

## Reporting frameworks

Development and financial institutions have committed to do more to boost the resilience of countries around the world. With the increase in attention to and investments in disaster risk management and climate change adaptation, it becomes more important to track performance, progress, and development outcomes.

Global initiatives have emerged to improve and increase reporting and disclosure of ESG and climate-related performance for investors, lenders and other stakeholders. For example, CDP encourages disclosure of environmental impacts management. Others bridge the sustainability issues into their financial performance<sup>i</sup>, and since 2017, TCFD focused only on the urgent need for climate change financial impacts reporting. TCFD recommendations help companies provide better information to support informed capital allocation. Also launched in 2017, the Transition Pathway Initiative (TPI), a global asset-owner led initiative, aligned with TCFD, benchmarks companies' climate action for the transition to a low carbon economy. And, to track the resilience of projects to climate change, the World Bank launched in 2021 a resilience rating system methodology.<sup>15</sup>

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<sup>i</sup> The Sustainability Accounting Standards Board (SASB) and Climate Disclosure Standards Board (CDSB). CDSB Framework for reporting environmental and climate change information. Advancing and aligning disclosure of

environmental information in mainstream reports. CDSB, London. Available from: [https://www.cdsb.net/sites/default/files/cdsb\\_framework\\_2019\\_v2.2.pdf](https://www.cdsb.net/sites/default/files/cdsb_framework_2019_v2.2.pdf)

Lastly, the EU has developed a taxonomy for sustainable activities to direct investment towards sustainable projects that will help meet the EU's climate and energy targets and the Green Deal's objectives by 2050. The EU Taxonomy will help investors and companies identify environmentally sustainable activities and projects that make a substantial contribution to mitigate and adapt to climate change.

*Hydropower is in a unique position to benefit from the opportunities risen from climate transition risks.*

The hydropower sector needs to develop better capabilities to identify, assess, and report climate-related risks and opportunities aligned with the global emerging recommendations and criteria to access long-term financing. So far, only the Hydropower Climate Resilience Guide is the only sector-specific tool to help incorporate climate resilience into hydropower project planning, design, and operations.<sup>16</sup> However, it falls short in reporting climate-related financial impacts to support lenders and investors in decision-making.

## **Opportunities for climate-related disclosure**

The Central Banks and Supervisors Network for Greening the Financial System opened its first comprehensive report stating that "climate-related risks are a source of financial risk".<sup>17</sup> Climate-related information is considered a critical contributor to directing capital efficiently to investment that drives climate change mitigation and adaptation solutions. Investors and financial regulators find themselves urged to systematically assess their portfolios' climate

risk exposure, including physical and transition risks. While physical risks refer to the manifestations of a changing climate and their associated costs, transition risks refer to the policy, legal, technological and market's effects on companies as economies decarbonise.

Hydropower projects are susceptible to physical climate impacts due to their dependency on precipitation and vulnerability to natural disasters. Yet, in some basins, hydropower projects can benefit from an increase in annual average runoff.

In a transition to a low-carbon and climate-resilient socioeconomic system, hydropower is in a unique position to benefit from the opportunities risen from climate transition risks. Should the project demonstrate its competitive advantage in these areas in an open way, it will increase awareness of its benefits, rebound in its reputation and social license to operate and broaden the investor base.

Consequently, policies favouring investment in sustainable economic activities and reducing fossil fuels' subsidies will likely increase their price. It will encourage the consumption of electricity from renewable energy sources like hydropower. In the last decade, hydropower has had the lowest global weighted average levelised cost of electricity (LCOE) below USD 0.05 per kWh, despite the remarkable decrease from solar photovoltaic and wind.<sup>18</sup>

With increasing water stress in some areas and extreme precipitation events, hydropower storage dams can provide strategic adaptation services of regional or national interest like drought mitigation and

flood control. New regulations to prioritise adaptation services can affect the operation regime and compensate existing hydropower assets for those adaptation services.

As described previously, a new market of climate finance through financial mechanisms such as green bonds or resilience bonds will mobilise capital to hydropower projects that contribute to climate targets.

Wind and solar are seeing as the core energy sources to tackle climate change, and in Europe, future scenarios expect that generation triples by 2030. Research and innovation in hydropower technology will further its energy storage, flexibility and ancillary services to enable the market penetration of wind and solar quicker. An exciting opportunity arises with hybrid projects, like floating PV in a hydropower reservoir, that make more efficient use of the resources (i.e. land, transmission lines). Even reservoir emissions could be allocated to both energy sources.

Reputational risks are inherent to hydropower. High emissions in some hydropower reservoirs or bad environmental performance can affect the entire sector reputation. However, those projects that can demonstrate their contribution to a low-carbon and resilient future will improve social perception and attract investors.

As such, reporting climate-related information can provide a whole new set of opportunities to the hydropower sector. Utility companies and asset managers reporting climate-related information can better understand the exposure of the company's operations to physical and

transition risks and improve their credit ratings and engagement with investors. Also, financiers will better understand and manage loans' portfolios exposure to climate-related risks and enhance risk evaluation for more informed investment and lending decisions.



## Findings and Key Insights

### Insights from the hydropower sector

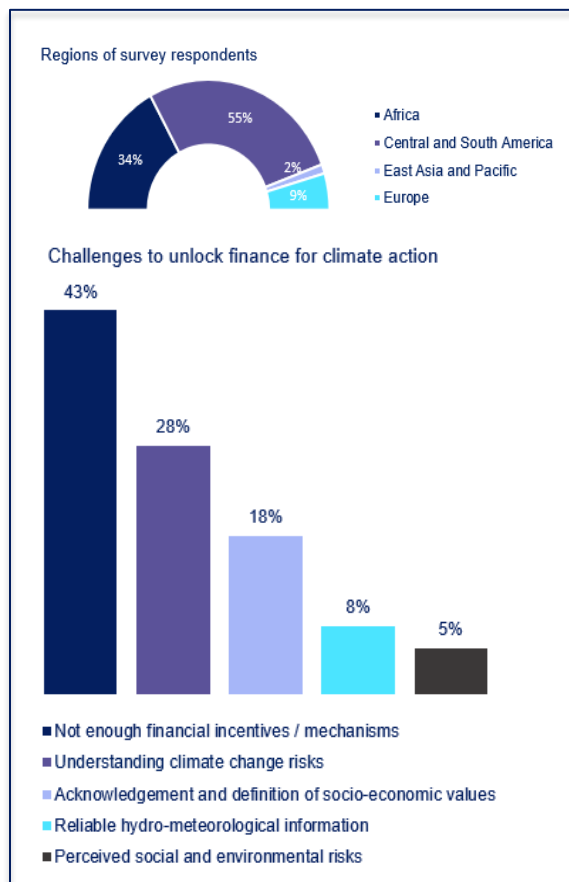
The impacts of climate variability and change are real and would continue to affect the global economy's sensitive sectors. Storms and their direct implications - precipitation, floods and landslides - were one major cause of losses and damages in 2019.<sup>19</sup> Developing countries are particularly affected by climate change impacts because they are more vulnerable to hazards and have lower coping capacity. Evidence shows that African countries have not been able to meet their development targets due to climate variability and change impacts on hydropower.<sup>20</sup> Africa

In the Global South, a large part of the population still lacks access to energy. Sustainable energy development offers a hope to connect economic growth to increased social equity while preserving the environment. In Africa, more than 600 million people do not have access to electricity. The estimation is that 20 million people will be added to the electricity network every year from now to 2030. Hydropower can play a significant role in a continent where about 90% of the hydropower potential remains untapped. IEA projects hydropower growth from a current 16% to 23% of the total electricity generation by 2040.<sup>21</sup> In Latin America, IEA projected that the hydropower capacity factor will decrease due to changing climate conditions by around 8% in the next 30 years compared to the current conditions.<sup>22</sup>

Adaptability and resilience to climate change are essential to developing new

hydropower projects and evaluating existing assets. However, accessing capital can be one of the main challenges for climate action.

We surveyed the sector to solicit the hydropower community's understanding of how to unlock finance for climate resilience and adaptation measures in hydropower.



The survey gathered feedback on the challenges to get climate financing for hydropower projects while exploring how data disclosure would address investors' concerns and how to best support access to capital. Organisations surveyed included utilities, operators, non-governmental organisations, and international financial institutions.

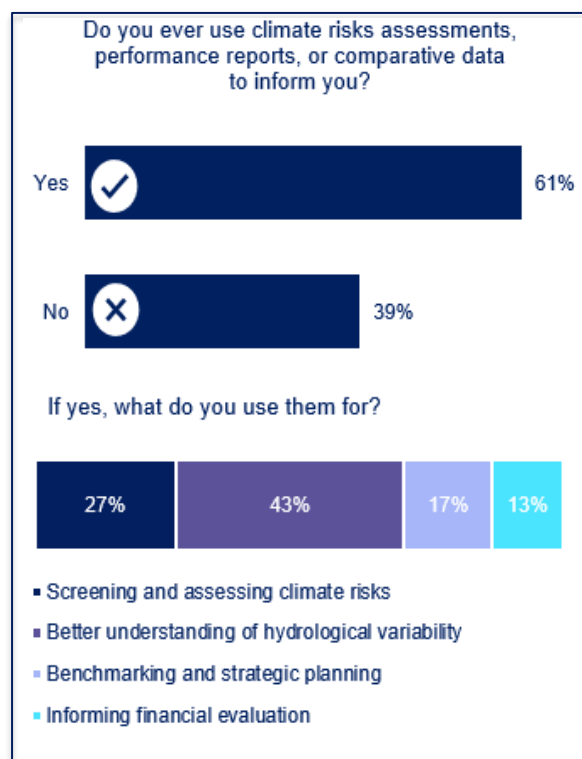
The survey focused on the hydropower sector in South and Central America and Africa. In all, 44 organisations participated, 54% from Central and South America, 34% from Africa and 11% from Asia and Europe.

The survey analysis showed that organisations based in Africa highlighted the failure to understand climate change risks, the lack of reliable hydro-meteorological data, and the length of investment returns as challenges to unlock finance for climate action. South and Central America participants reported the lack of financial incentives to improve hydropower resilience and mismatch between assets lifecycle and long-term measures and available financial mechanism, social and environmental risk perception by investors, and the undefined socio-economic values as challenges to attract investment in the region.

When it comes to climate-related reporting and establishing a sustainability strategy, it is clear that organisations are stepping up the pace. Over 60% of respondents reported using climate risk assessments, performance reports or comparative data on climate-related aspects. The main reasons were to better understand hydrological variability to mitigate operational, environmental and social impacts, and screen and assess long-term physical climate risks to develop management action plans. Also, respondents use this information for benchmarking and strategic planning to demonstrate projects' contribution to climate change action. And last but not least, to inform financial evaluations used by financiers as well.

African-based participants recognised that organisations would benefit from climate-

related disclosure to improve the project's bankability and enhance investors' trust, and consequently, to access finance. Also, increased internal and external awareness would build a better corporate brand. America-based participants reported increased efficiency, and therefore, higher return on investment, transparency purposes and risks management as the main benefits for disclosing climate-related information.



Despite the increasing interest of the hydropower sector in climate-related disclosure, the survey results also show that almost 40% of the participants do not use any climate risks assessments, performance reports or comparative data to inform on climate-related risks and opportunities. Organisations are also concerned about the impact of climate-related disclosure on the required amount of work and how that could be absorbed, especially for smaller-sized organisations.

We conclude that a higher level of understanding about climate change physical and transition impacts at the project level and reporting standardisation would support the hydropower sector to improve investors' confidence and access climate finance.

## Call for standardisation and industry metrics

As assets allocated to green investment have boomed in recent years,<sup>23</sup> regulatory initiatives have also accelerated with the TCFD recommendations leading the discussion. At regional level, the European Union's Sustainable Finance Disclosure Regulation is stepping up with new ESG metrics for companies to report. These initiatives pose clear opportunities for the

### KEY TAKEAWAYS FROM THE TCFD ELECTRIC UTILITIES PREPARER FORUM BY WBCSD

Six of the largest electric utilities worldwide, representing 7% of the global hydropower installed capacity, formed the TCFD Electric Utilities Preparer Forum. To advance the implementation of the TCFD recommendations, they reviewed their disclosures and identified any potential improvements. The forum highlighted the challenges to assess the resilience of company strategies concerning climate-related physical risks over transitional risks. Although the regulatory context might be more volatile, it is hard to manage assets risks because they are associated with long-term planning, location-specific, and scientific advances. Lastly, the inconsistency in metrics raises the opportunity for the development of common industry-specific methodologies.

sustainable development of hydropower projects.

According to TCFD 2020 Status Report,<sup>24</sup> the energy industry companies (including oil and gas, coal, and utilities) have a larger percentage of disclosure across the 11 recommended disclosures. The reporting increased up to 16% in TCFD-aligned information disclosure since the report

*"It is important more standardisation in reporting requirements to maximise the value of disclosure."*

*Michael Bloomberg, TCFD Chair*

tracking started in 2017, but continuing progress is necessary. Of the eleven recommended disclosure, the least reported is the resilience of the organisation's strategy to climate change impacts. And larger companies (>\$10 billion market capitalization) disclose more information aligned with TCFD recommendations.

The disclosure differs widely per region. Europe leads the way, while Latin America and the Middle East and Africa have the lowest TCFD-aligned reporting percentages. These regions have the lowest number of companies supporting the TCFD recommendations (only 3% and 2%, respectively).

The chair, Michael R. Bloomberg, asserts the need and relevance of standardization in reporting to maximise disclosure value. Companies should look to industry TCFD-aligned recommendations and standardised metrics that incorporate investor's feedback to ensure the information is relevant and useful for financial decision-making. Besides, these defined metrics and way of reporting would allow for comparability within each industry.

As a first step to fulfil this need, The TCFD Electric Utilities Preparer Forum report addressed some of the electric utilities' challenges in responding to the TCFD's recommendations.<sup>25</sup>

Furthermore, policy-makers and regulators have an increased interest in specifically requiring climate-related financial information disclosure. The governments of Belgium, Canada, Chile, France, Japan, Sweden, and the United Kingdom support TCFD recommendations and New Zealand might become the first government to make disclosures aligned with TCFD mandatory.<sup>26</sup>

The European Union Commission also encourages disclosure of information per the widely accepted TCFD framework. The EU guidelines on reporting climate-related information provide a mapping of how the Non-Financial Reporting Directive Requirements compare to TCFD Recommended Disclosures. The guidelines recommend disclosures in the areas: business model, policies and due diligence processes, outcomes, principal risks and their management, and key performance indicators. These recommendations also consider other standards and frameworks developed by CDP, the Climate Disclosure Standards Board (CDSB) or the Sustainability Accounting Standards Board (SASB).<sup>27</sup>

## Linking project level and corporate level

There is a gap between corporate disclosure and project-level disclosure. Project-level disclosure aims to understand the project's climate risks and the project's negative impacts on the climate, which could hinder access to financing. Whereas increasing

corporate level disclosure and climate impact reporting aim to transform governance policy and strategy.

Across the world, governments are

*TCFD recommends corporate-level disclosure while EU and CBI Taxonomy define climate-specific criteria for hydropower project development.*

developing taxonomies or criteria to define what a green project is, aligned with the objectives of the Paris Agreement on climate change. Climate Bond Initiative (CBI) and EU Taxonomy have developed specific criteria for hydropower projects.

The paper examines how these taxonomies might inform TCFD recommended disclosures at the corporate level.

## EU Taxonomy

The EU's Action Plan on Financing Sustainable Growth (March 2018) called for creating a classification system for sustainable activities - the so-called EU Taxonomy - to support companies navigate the transition to a low-carbon, resilient and resource-efficient economy.<sup>28</sup>

The EU Taxonomy aims to incentivise investors and issuers to put money towards economic activities that enable a greener future. These activities need to contribute substantially to one of six environmental objectives and do no significant harm to the other five. These include climate change mitigation, climate change adaptation, sustainable and protection of water and marine resources, a transition to a circular economy, pollution prevention and control, conservation and biodiversity restoration.

In line with the Regulation on Sustainability-Related Disclosures, the European Commission will specify by June 2021 how non-financial and financial companies shall refer to the EU Taxonomy in their disclosure obligations.

The technical screening criteria for the hydropower sector will enter into application by the end of 2021. It applies to all types of stations, including pumped storage facilities. The criteria require that hydropower plants have a power density lower than 5 W/m<sup>2</sup> and a lifecycle emission lower than 100 gCO<sub>2</sub>eq/kWh once allocated to the hydropower use per the operating regime methodology used in the G-res Tool. The lifecycle emissions threshold will decline staggered to 0 gCO<sub>2</sub>eq/kWh by 2050.

Hydropower projects will need to comply with EU Regulations or IFC Performance Standards on the environment, biodiversity and social aspects to demonstrate no significant harm to the other environmental objectives. Hydropower can also show that it is an enabler of climate adaptation if it reduces physical climate risk and supports system adaptation.

## Climate Bonds Taxonomy

Hydropower projects and related infrastructure that are low carbon, and promote adaptation and resilience to climate change in the systems in which they are, can access climate bonds if they meet eligibility criteria.

CBI's Climate Bonds Standard provides clear, sector-specific eligibility criteria where hydropower projects need to demonstrate that they are sufficiently low carbon and do not cause significant adverse impacts to several environmental and social issues. Once the project (in operation before 2020)<sup>ii</sup> demonstrates a power density greater than 5W/m<sup>2</sup> or an emissions intensity threshold of less than 100gCO<sub>2</sub>eq/kWh, the HESG Gap Analysis Tool<sup>29</sup> assesses environmental, social and governance issues including climate resilience and adaptation.

## Comparative between CBI, EU criteria and TCFD recommendations

TCFD recommends disclosure at the corporate level for four core areas: governance, strategy, risk management and metrics and targets. In contrast, EU Taxonomy and CBI provides technical criteria for hydropower projects. There are synergies between technical criteria and recommended corporate-level disclosures; the former informs and supports climate-related financial reporting. Table 1 compares CBI criteria and EU Taxonomy to TCFD core areas.

Regarding metrics and targets, both CBI and EU Taxonomy define thresholds for hydropower power density and emissions intensity to address the contribution to climate mitigation. Besides, TCFD recommends disclosing GHG emissions from energy purchase (scope 2) and value chain activities (scope 3) in line with the

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<sup>ii</sup> If the project has commenced operation after 2020, it must have a power density over 10 W/m<sup>2</sup> or comply with an emissions intensity threshold lower than 50 gCO<sub>2</sub>eq/kWh.

GHG Protocol Methodology.<sup>30</sup> This methodology also includes estimation and reporting of avoided emissions.

They diverge in terms of risk management. The EU Taxonomy points out that hydropower project development shall not significantly harm the other environmental objectives, including climate adaptation. But, it does not look at the project's climate risks. Likewise, climate risk assessment is not prominent in CBI's criteria; it focuses more on the sustainability assessment of environmental, social and governance aspects. It includes an action plan to close the identified gaps by the assessment to achieve good practice.

The organization's businesses, strategy, and financial planning can benefit from the criteria's assessment and compliance to access to green finance. Yet, the business, strategy and financial planning will not be

complete without considering the climate risks of hydropower operations.

TCFD recommendations push beyond sustainable finance at the governance level to fully understand the implications of climate change risks, those being either physical or transitional.

CBI and EU Taxonomy's ultimate goal is to incentivise economic activities such as electricity production from hydropower that mitigate climate change or contribute to the decarbonisation of the system to achieve the Paris Agreement. And, they put less attention to the climate resilience and adaptation role of hydropower infrastructure and operation. Also, both criteria treat hydropower projects as an energy source and do not acknowledge their contribution to water security.

Table 1. Mapping of CBI Criteria and EU Taxonomy for hydropower with the TCFD's core areas for disclosure.

| TCFD core areas            | TCFD (corporate level)   | CBI Criteria (project level)  | EU Taxonomy (project level)  |
|----------------------------|--|---|--|
| <b>Governance</b>          | The organization's governance around climate-related risks and opportunities   | Governance for green finance  | Governance for sustainable activities finance  |
| <b>Strategy</b>            | The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning | Benefits of accessing climate finance for the organisation's business, strategy and financial planning.   | Acknowledgement of sustainable activities.   |
| <b>Risk management</b>     | The processes used by the organization to identify, assess, and manage climate-related risks   | HESG Gap Analysis Tool Assessment to identify gaps of the project's performance respect to international good practice. It includes an action plan, but not a monitoring plan beyond 24 months. Monitoring can be part of the bond's use of proceeds. | Do No Significant Harm assessment to the other environmental objectives defined in the EU Taxonomy. At least do: <ul style="list-style-type: none"> <li>• River basin management plan (including cumulative impact assessment)</li> <li>• Environmental and Social Impact Assessment</li> <li>• - Compliance with EU regulations or IFC's environmental and social standards when relevant.</li> </ul> |
| <b>Metrics and targets</b> | The metrics and targets used to assess and manage relevant climate-related risks and opportunities. GHG scope 1, 2, and 3                      | Power density and emissions intensity (scope 1). Emissions can be estimated by the G-res Tool.  | Power density and emissions intensity (scope 1).<br>Risk assessment for activity enabling adaptation   |

## Conclusions

### Need for reporting standard

There are more social awareness and social pressure to move away from economic activities that can adversely impact the climate. Policies favour investment in economic activities that contribute to achieving the Paris Agreement and net-zero targets by 2050. While ESG frameworks prove to be necessary, they are not sufficient to assess and manage climate-related risks. Climate change has gone out of being a cross-cutting issue to become the deal-breaker of technical criteria because of the urgency to tackle climate change. That is why high greenhouse gas emission from reservoirs is a determining factor for hydropower project development.

Climate change can also negatively impact companies' development, performance, and operations because of the exposure to physical and transition risks. Due to the dependence on hydro-climatic variability, hydropower projects are vulnerable to climate change. In contrast, they find opportunities when analysing the transition risks.

Several initiatives, and outstandingly the TCFD recommendations, guide companies to report and disclose climate-related financial performance for investors, lenders and other stakeholders. Increasingly, governments are integrating TCFD recommendations into their reporting requirements. For example, the European Commission has incorporated the TCFD recommendations into its Guidelines on Reporting Climate-Related Information. Besides, the UN Principles for Responsible

Investment (PRI) has made reporting against TCFD-based indicators mandatory for its signatories.

EU Taxonomy is leading for non-financial reporting. By the end of 2021, companies will need to disclose the proportion of investments aligned with the taxonomy and explain how they have determined they are sustainable.

These recommendations and taxonomies provide the framework, but there is a need for industry-specific reporting standards supported by best practice. Given the relevant role of the hydropower for water and energy security, clear guidance is necessary to report physical and transition risks and opportunities that arise from climate change.

### Project level disclosure

The EU taxonomy and the recently approved CBI Hydropower Criteria are hydropower specific. They only look at hydropower as an energy source, although hydropower projects have a crucial contribution to water and energy systems' resilience. Failure to comply with the technical criteria for climate mitigation might discourage the development and modernisation of important hydropower assets that provide multiple socio-economic benefits.

The taxonomies define the criteria and thresholds to access finance. However, they fall short in reporting climate change risks and opportunities to lenders and investors. Corporate disclosure aims to provide information about a company's impacts on climate and climate change impacts on the company's business to investors. Nevertheless, hydropower projects'



characteristics are very site-specific; corporate disclosure of hydropower operators and asset owners can only be an aggregation of project-level disclosure.

Providing information on the project's impacts on climate and project's performance under climate change conditions adds clarity about which projects are crucial for decarbonising the economy and provide more value to society. This information is valuable for financiers to mobilise capital towards the development, modernisation and upgrades of these assets.

In addition, project-level disclosure contributes to the company's prestige and reputation. Open data on metrics and targets also support project benchmarking, fosters continuous improvement, and attracts investment.

## Way Forward

The TCFD recommendations, the EU Taxonomy and CBI Hydropower Criteria for Climate Bonds Standard, prove important steps towards mainstreaming disclosure of climate-related risks and opportunities.

This paper sets out the ground for the need for standardised frameworks to ensure that the disclosure fulfils the requests by investors, lenders or policy-makers. More so, to provide commonly-agreed metrics that properly assess hydropower assets' contributions to both water and energy systems under climate change context.

Open Hydro aims to incentivise and guide hydropower stakeholders towards project-level disclosure to become a leading sector on environmental transparency and climate action accountability.

*"Our goal is to help to finance or re-finance hydropower projects by providing the tools to demonstrate their contributions towards a climate-resilient, zero-carbon planet."*

*Open Hydro*

By working towards hydropower-specific project-level metrics, we aim to tackle the key burdens hindering the development of new and existing hydropower projects.

The goal is to help the effective mobilisation of climate investment to finance or re-finance hydropower projects by providing the tools to demonstrate their contributions towards a climate-resilient, zero-carbon planet.

As a first step, Open Hydro is starting a consultation process with targeted experts to enhance the hydropower sector's insight

and the potential alignment with the most relevant disclosure frameworks, as presented in the paper. As a result of the feedback, the white paper will be updated.

As a second step, Open Hydro wishes to further engage with the targeted audience and direct the actions towards:

- Working with hydropower asset owners and operators on implementing TCFD recommendations.
- Steering the development of hydropower-specific guidance, including metrics and targets, in accordance with TCFD recommendations and considering other international frameworks.
- Ensuring updating of regular metrics and targets aligned with best practice and in line with the latest scientific evidence.
- Incentivising and guiding the hydropower sector towards project-level disclosure to boost the confidence and trust of investors.
- Providing a platform to facilitate the disclosure and benchmarking accessible by both project owners and investors.
- Increasing awareness and providing training for hydropower stakeholders on the relevance of climate risk management and disclosure through workshops.

## Acronyms

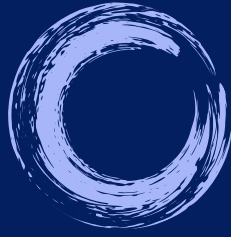
|         |   |
|---------|---|
| ADB     | Asian Development Bank  |
| AFD     | French Development Agency   |
| CBI     | Climate Bonds Initiative  |
| CDP     | Climate Disclosure Project  |
| CDSB    | Climate Disclosure Standards Board  |
| CPI     | Climate Policy Initiative   |
| EDF     | Électricité de France (France Electricity Company)                          |
| EDP     | Energias de Portugal (Portugal Energy Company)                              |
| EBRD    | European Bank for Reconstruction and Development                            |
| EIB     | European Investment Bank  |
| ESG     | Environmental, Social and Governance  |
| FMO     | Dutch Entrepreneurial Development Bank                                      |
| FSB     | Financial Stability Board   |
| GCA     | Global Centre on Adaptation   |
| GHG     | Greenhouse Gases  |
| ICE     | Instituto Costarricense de Electricidad (Costa Rican Electricity Institute) |
| IDB     | Inter-American Development Bank   |
| IHA     | International Hydropower Association  |
| IPCC    | Intergovernmental Panel on Climate Change                                   |
| IUCN    | International Union for Conservation of Nature                              |
| MAR     | Mean Annual Runoff  |
| Norad   | Norwegian Agency for Development Cooperation                                |
| REH     | Renewable Energy Holding  |
| SASB    | Sustainability Accounting Standards Board                                   |
| SECO    | Swiss Agency for Development and Cooperation                                |
| TCFD    | Task Force on Climate-related Financial Disclosures                         |
| TNC     | The Nature Conservancy  |
| TW      | Terawatt  |
| UNEP    | United Nations Environment Programme  |
| UNEP FI | United Nations Environment Programme Financial Initiative                   |
| WB      | The World Bank  |
| WBCSD   | World Business Council for Sustainable Development                          |

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# OPEN HYDRO

For a climate resilient future

## About us

Our vision is a climate resilient, zero-carbon planet, where water and energy are accessible to all.

We are a not-for-profit international organisation that aims to accelerate climate action and empower organisations to demonstrate their contributions towards a climate-resilient, zero-carbon planet. In doing so, we aim to:

- Help the effective mobilisation of climate investment to water and energy facilities.
- Promote climate-related disclosure to attract investment and access for financing.
- Advance evidence-based knowledge on climate-related risks and opportunities.
- Showcase solutions and actions to face the climate change crisis.
- Provide resources to make informed climate-related decisions.

## Speak to us today

[Book a 30-minute consultation with our team](#)