



IIAC LETTER

Taxonomy Developments and Issuance Potential in Canadian Transition Bond Markets in 2021

PREFACE

The Investment Industry Association of Canada (IIAC) has developed this paper to highlight developments in the transition bond market taxonomy, both globally and in Canada and to identify proposed financing structures and practices. Recommendations are intended to stimulate thinking on common approaches and frameworks and to encourage a more vigorous transition bond market in Canada. Appendix A briefly summarizes some of the important characteristics of green bond issuance both globally and in Canada in the 1st half of 2020. The primary focus of this paper, however, will be outlining the potential for inaugural Canadian transition bond issuance in 2021 and ways to foster growth of this market in subsequent years. A key challenge identified is the need to develop a more broadly accepted and uniform taxonomy, definitions, and data reporting system for transition bonds in Canada.

Efforts continue domestically to identify ways to encourage green bond and transition bond issuance and promote partnerships and identifying investment projects financed by the proceeds of these issuances. Continued development of green bond, and particularly the first issuance and growth of the transition bond market is needed. Transition bond proceeds would provide an alternative source of funding to finance a diverse range of projects across Canada, including projects in carbon intensive industries that have been excluded from exiting sustainable financing initiatives. This would be greatly beneficial to Canada's carbon emission reduction goals and contribute to the IEA's global carbon emission goal of limiting the average global temperature increase to 2°C.

TRANSITION BONDS OVERVIEW

There is widespread and virtually unanimous agreement that there is an immediate and pressing need to slow and eventually reverse greenhouse gas emissions globally. As indicated, green bonds have become an important way to finance transitions that support this cause. As the green, social, and sustainable bond markets have grown the types of activities that qualify for this financing has also grown. The universe of climate aligned bonds has also expanded and evolved at a rapid pace, but big greenhouse gas emitters have largely been excluded from accessing financing to begin the transition from brown to green and to a more climate friendly carbon footprint. There are compelling arguments that there is a need for these excluded businesses and industries to have access to financial markets. This would enable them to fund the transformation of their activities and assist their pursuit of a green transition in the near term.

While these excluded entities have not been a significant portion of the green finance marketplace to date, they could potentially play a material part in ultimately reducing global emissions. In addition, many of these excluded firms and industries are currently important portions of countless investors investment portfolios.

For green bonds there is a well-developed set of criteria on how proceeds must be allocated to projects. Qualifying projects have to provide clear environmental benefits and the projects usually fall under defined and specific categories. For transition bonds the guidelines are currently being developed and present thinking is that proceeds from transition bonds should provide similar disclosures to those found for green bonds. AXA Investment Managers have published an initial set of guidelines that are similar to the well-established Green Bond Principles. They set out use of proceeds, process for project evaluation and selection, management of proceeds and reporting.¹

As has been mentioned above, the development of transition bond guidelines are under development by several parties, but they need to be widely socialized, discussed, and built upon to develop a meaningful consensus in Canada.

EXAMPLES OF TRANSITION MARKET TRANSACTIONS

To date there have been only limited number of transition bonds transactions and the ones that have taken place have, unfortunately, used differing definitions of transition activities. As a result, investors have justifiably been concerned around the lack of robust, universally adopted industry standards and metrics for transition bonds. The risk of greenwashing is a serious worry for some investors (see Table 1 below).

TABLE 1

The table below outlines a number of transition bond transactions that have taken place over the last few years. "Most of these have a strong focus on climate mitigation objectives, often linked to wider SDGs and a few transactions have explicitly been labelled as 'transition'. However, dozens of deals have come to market which, while tagged as 'green', are highly pertinent to the transition debate".²

ISSUER	LABELLED	SECTOR	USE OF PROCEEDS	ASSESSMENT
Cadent	Transition	Gas Distribution	Methane Leakage	Green/Trans
EBRD	Green transition	Development Bank	Energy Efficiency	Green/Trans
ENEL	SDG	Power Utility	General	Green/Trans
Marfrig	Sustainable transition	Beef Processing	Ethical Beef Purchasing	Neither
Orsted	Green	Oil & Gas	Renewables	Green
Repsol	Green	Oil & Gas	Energy Efficiency	Neither
SNAM	Climate action	Gas Distribution	Various Energy Effic.	Transition

Source: CBI

¹ AXA Financing brown to green: Guidelines for Transition Bonds https://realassets.axa-im.com/content-/asset_publisher/x7LvZDsY05WX/content/financing-brown-to-green-guidelines-for-transition-bonds/23818

² Climate Bonds White Paper <https://www.climatebonds.net/system/tdf/reports/cbi-fin-cred-transitions-092020-report-page.pdf?file=1&type=node&id=54300&force=0>

There has been some concern expressed of the potential for greenwashing if the transition label that is/or will be used has a broad definition for activities that are only a slight improvement over existing non-green activity. If this is the case these transition investments may not conform to a Paris-aligned transition path. To avoid these situations where any improvements only have a very limited impact on reducing total emissions, clear definitions and data collection procedures need to be put in place and there will have to be an increased measure of consistency among various projects that are being considered. These same growing pains were experienced in the green bond market and over time there has been an alignment of robust standards, definitions, and taxonomy.

The idea that transition and any related label should only be associated with industries and companies that are attempting ambitious transitions and as an accompaniment and enhancement to well established green labels is gaining some traction. As the transition market grows there will be a need to continue developing a common scientifically credible framework for these new industry sectors that have been excluded from traditional green finance.

THE DEVELOPMENT OF TRANSITION BOND TAXONOMY

As a starting point we will consider a set of guidelines for transition bonds that AXA Investment Managers has published. This initial set of guidelines are similar to the well-established Green Bond Principles and are briefly outlined below:

- **Use of proceeds** – the proceeds raised must fund predefined climate aligned projects with transition related activities that include, but are not limited to energy, transportation, and heavy industry.
- **Process for project evaluation and selection** – As per AXA, Investors must be given clear and concise detail of what are eligible investments, what the eligibility criteria is, and the process used for asset selection.
- **Management of proceeds** – There must be confidence that the proceeds are allocated to the designated eligible purpose and that the use of proceeds is tracked on an ongoing basis.
- **Reporting** – Transparency and availability of updated information on the use of proceeds is critical. Detailed impact assessments should also be available, and it is strongly encouraged for the transition projects to have an external certification through an annual audit.

Delivering on transition projects requires clear and widely agreed upon transition paths. In addition, there must be defined end goals and not just sweeping statements. There also has to be a commitment to collect meaningful and accurate data that measures real progress towards achieving stated goals that should align to IEA and be consistent with broader objectives set out in the Paris Agreement. This can be difficult because the benefits are based on a long-time frame and it may sometimes be hard to align and justify associated costs.

In Canada, the Canadian Standards Association (CSA) is also "currently developing a National Standard of Canada for Transition Finance, including a taxonomy of activities intended to reduce GHG emissions in line with the transition to a lower carbon economy in Canada, for the following

seven priority sectors: i) oil and gas (upstream, midstream and downstream utilities), ii) utilities (energy production), iii) agriculture, iv) forestry, v) transportation (focus on heavy duty vehicles - railways, aviation, trucking), vi) materials (cement, steel, glass), vii) mineral mining. It will build on existing taxonomies and guidance, in particular the EU Taxonomy".³ A Canadian Transition Finance Taxonomy document was planned to be published in the summer of 2020, but as an example of how difficult it is to gain consensus on transition issues, taxonomy and measurable data, the publication of this document has been pushed to 2021. The document is planned to be a basis the development of a Canadian National Standard.

The International Organization for Standardization (ISO) is similarly in the process of defining an international green bond standard. ISO 14030 is expected to be completed in 2021. It is planned that the standards "will reference appropriate local taxonomies, not establish a meta or global taxonomy, and therefore will automatically incorporate any transition principles and resulting transition pathways embedded in those taxonomies".⁴ The desired outcome of this approach is that while there will consistency in an overall approach, certain country specific elements, such as Canada's unique energy and resource sectors will not be excluded.

As shown in Table 1 above, over the last several years there have been several labelled transition bond issuances, however, as indicated there has not been any consistent set of definitions for these transitions. Some of the improvements that need to be made to enhance the reliability, acceptance and ultimately the environmental impact of these future transition financings include:

- Enhanced disclosure by companies
- Consistent and uniform data measurement
- Agreed upon taxonomy and definitions

TRANSITION FRAMEWORKS AND PATHWAYS

While everyone would agree that the ultimate goal in Canada and globally is to have a broad range of zero emission economic activities, today only a few activities currently run at zero emissions. It is feasible that some high carbon emitting could enact low or zero emissions solutions over time, while other sectors realistically have no such solutions with current technology.

A list of likely examples of credible transition measures are listed below in Table 2 below.

TABLE 2

ACTIVITY CATEGORY	MEASURES TO DECARBONIZE ACTIVITIES	MEASURES TO TRANSITION AWAY FROM ACTIVITIES THAT OUGHT NOT BE PART OF THE LONG-TERM ECONOMY
Near zero	Replacement of wind turbines with more efficient models	N/A
Pathway to zero	Deep retrofits of residential properties Retrofit of shipping vessels to run on green ammonia Installation of CCS in steel manufacturing facility Kiln	N/A

³ Climate Bonds White Paper <https://www.climatebonds.net/system/tdf/reports/cbi-fin-cred-transitions-092020-report-page.pdf?file=1&type=node&id=54300&force=0>

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	electrification for cement production Switch to use of 100% recycled materials in clothing production	
No pathway to zero	Retrofits of airline fleets to operate with a maximum biofuel or synfuel mix	N/A
Interim	Installation of gas capture at a waste-to-energy plant treating only residual waste Switch from fossil fuel-based plastics to compostable alternative in production of bottled mineral water Capture and utilize gas leakage in gas pipelines	Early shut down of waste to energy facilities when circular economy sufficiently established and residual waste is minimized
Stranded	Capture and utilization of gas leakage from closed landfill [noting that these investments are recognized not because of the need or desire to transition stranded activities, but rather to maximize opportunities to halve global emissions by 2030]	Early decommissioning of a coal-fired power station
Enabling	R&D in technologies for the production of new construction materials using low emission cement and steel	N/A

Source: CBI

RECOMMENDATIONS OF AREAS WHERE THERE NEEDS TO BE IMPROVEMENT IN GREEN AND TRANSITION BONDS

There needs to be a shift in thinking that the main goal of sustainable finance is not to simply attract capital for green projects, but rather maximize reductions in greenhouse gas emission from all sources. To this end including the transition of oil and gas production to a greener path is where maximum efficiency improvements can be accomplished. In Canada, it has been estimated that over 25% of all carbon emissions are emitted through oil and gas production activities.

There is a need to explore and support ways to facilitate the green transition of economic sectors and businesses that have so far been excluded from green finance. This involves encouraging greenhouse gas (GHG) intensive industries which includes materials, chemicals, freight, and aviation to implement greener business practices. There is a growing realization and agreement that, while there must be an effort that starts domestically this problem is global in nature. The effort must encompass all industries to achieve the goal of limiting rise in global average temperature to well below 2°C outlined in the Paris Agreement.

To date there has not been significant commitment from many industries that currently fall into potential transition sectors. Global financial marketplaces have however begun to consider the potential green transitions for what are currently highly polluting industries for transition bond issuance. As discussed, while there is no commonly accepted definition on use of proceeds for transition bonds can finance, work towards this is proceeding and will come to fruition.

To be credible companies in transition should make significant and measurable emissions reductions to existing activities in the short and long run. In time these companies should move to activities that are green and consistent with the Paris Accord. As the transition market grows and matures, investors will want to be reassured that that activities which have been given a

transition label are achieving the desired emissions reduction impact and this has been evaluated and confirmed by a third party.

CONCLUSION AND NEXT STEPS

For transition bonds to gain traction and see material issuance in Canada and abroad, there needs to be a concentrated push to develop widely accepted frameworks and taxonomy with a focus to support credible transition projects. There is a growing consensus that supporting the swift growth of a transition bond market can be an integral part of a larger and liquid ESG aligned market. Credible and measurable standards and data collection will be demanded by investors and provide clarity for underwriters and integrity for issuers.

Importantly, the use of proceeds does not have to finance a project classified as green by current Green Bond Principles, but instead promote the transition industries and projects to a smaller environmentally friendly footprint and eventually sustainable green activities. The acceptance by investors, third party rating agencies, governments, and the general public that funding large CO₂ emitters and to invest in a transition towards and contributing to the move to a low-carbon economy is a must for transition bonds to succeed. It is clear that this represents a significant change and from exclusively funding clean or green projects.

As discussed, the transition concept can be applicable to entire entities or to specific activities on the following basis:

- The label can be applied to the entire entity if the whole company is on a transition pathway. Determining how to document this to certify all of a company's transactions is complex still at an early stage.
- For specific activities it is much easier to collect data and follow similar principles and use similar types of bonds such as asset-backed securities (ABS) and use of proceeds bonds. These concepts are well developed in the large and growing green bond market and can and should be applied where possible to the nascent transition bond market.

NEXT STEPS:

- The IIAC will continue to work with member firms, including those represented on our Transition Bond Working Group and seek input from buy-side institutions to further the green and transition bond markets in Canada. This group will endeavor to develop a comprehensive set of recommendations and liaise with the CSA and other groups in Canada.
- After a successful virtual ESG & Transition Bonds Conference on November 16, 2020, IIAC will again work with members to host its second annual half-day ESG & Green Bond Conference in the fall of 2020.
- The IIAC will stay connected with international developments and disseminate important information as it arises in the green and transition bond space and with the help of its working group and committees determine what the implications for Canada are in a proactive fashion.

Appendix A

Currently, In Canada, bonds with green use of proceeds are the most common form of financing. Of note, however, for green bonds, there is a further categorization by the Climate Bonds Initiative (CBI)—a recognized leader in green bond financial information— which separates deals into certified greens, labelled greens that meet CBI criteria, and labelled greens that do not meet CBI criteria.

SUMMARY OF 1ST HALF OF 2020 GREEN BOND ISSUANCE

Through the first half of 2020 there was USD \$92.1 Billion in green bond issuance according to the CBI. This amounts to only 74% of the approximately USD \$125 Billion issued in the first half of 2019. The green bonds issued in the first half of 2020, were transacted in 23 different currencies and of note over 50% of these were Euro denominated. This is not surprising given the dislocation that occurred in March and April 2020, due to the COVID-19 pandemic, and the emergence of pandemic bonds out of China - Figure 1.

FIGURE 1

Most even thematic split in H1 2020

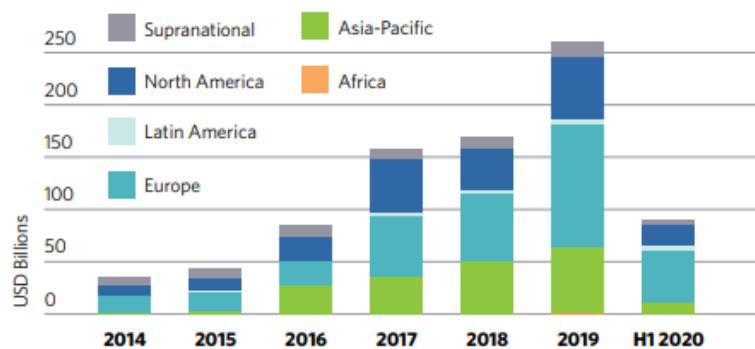


Source: CBI

As illustrated in Figure 2, the supply of green bonds comes from a broad base of issuers located primarily in Europe, North America, and Asia, with Europe continuing to dominate issuance.

FIGURE 2

Europe >50% of issuance for first time



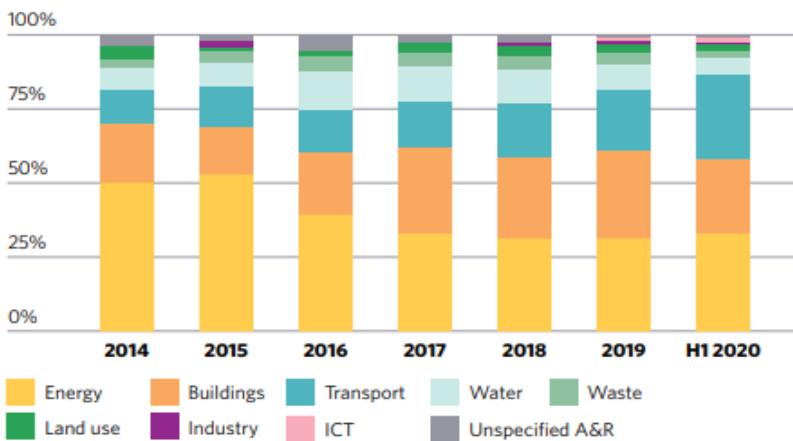
Source: CBI

GLOBALLY - INVESTMENT IN RENEWABLE ENERGY CONTINUES TO LEAD THE WAY

Globally, in 2019, as can be seen in Figure 3, project investment in renewable energy and low carbon buildings still accounted for the largest share of green bond funds. It is worth noting however, that other uses such as transport and water accounted for a combined 29% use of proceeds. In the future, it is expected that a wider range of projects will be financed. Waste, Land Use, and Adaptation investments may increase as clearer mandates are articulated and championed for projects in these areas.

FIGURE 3

Top 3 UoP categories reach record 87% share



Source: CBI

Ultimately, the issuance of green bonds depends on local market conditions, including borrowing rates, market liquidity, investor appetite, regulatory factors and the priority placed on socially responsible investing.

THE CANADIAN GREEN BOND MARKET BACKDROP

Canada has a material presence in Green bond issuance but is still a relatively small player compared to China, the United States, and the larger European issuers. Several Canadian issuers successfully placed their Green bonds in international markets in 2019 and 2020, but domestic investors have continued to be the main purchasers and remain very receptive to Canadian Green bond supply. Some of these investors have signed onto the UN's Principles for Responsible Investment (PRI) as well as establishing their own responsible investing guidelines.

CANADIAN ISSUERS AND MARKET DYNAMICS IN 2020 AND BEYOND

As Table 1 above shows, in 2019, there was a good mix of issuance between financial and corporate firms and government entities. There was also a mix of currencies used, comprised of issues in CAD, USD, and EUR. Of note was a EUR 1 billion CPPIB deal early in 2019, the second issuance by this pension fund which remains the only Canadian pension fund to issue a Green bond to date.

The Province of Ontario continues to lead all other issuers in domestic Green bond issuance, but other issuers are closing the gap. Currently, Green bond issuance for Ontario and Quebec accounts for less than 3% of their overall provincial funding. It is expected this percentage share will remain roughly the same in 2020. As well, funding requirements for Ontario's and Quebec's green supplies will not have any effect on maintaining sizable, liquid conventional bond benchmarks, and there is scope for a higher market share for Green bonds as the market deepens.

Appendix B

A SUMMARY OF CBI'S INSTRUCTIVE GUIDANCE FOR THE CONCEPT OF TRANSITION

Technical Expert Group to the European Commission (the 'TEG') released its recommendations for an EU Taxonomy of Sustainable Finance (the 'recommended EU Taxonomy'). The Commission will use this as the basis for an EU Taxonomy that will be adopted in regulation by the end of 2020 and enter into application by the end of 2021. Member states and the EU will be required to apply the Taxonomy when adopting measures (e.g., setting labels or standards) presented as 'environmentally sustainable'. Similarly, financial market participants who offer financial products (debt, loans, equity investments) will be required to disclose compliance of those products and their underlying activities with the Taxonomy. Likewise, large corporates and groups subject to the Non-Financial Reporting Directive (NFRD) will need to disclose compliance. The recommended EU Taxonomy currently addresses six environmental objectives: climate change mitigation, climate change adaptation, water management, circular economy, ecosystem protection, and pollution prevention and control. Finance will be compliant with the taxonomy if it delivers a substantial contribution to at least one of these objectives and does no significant harm to the others and respects minimum social safeguards. The intention is to extend to all six environmental goals, and to incorporate more specific social goals. The criteria screen for 70 economic activities spanning seven macro sectors: (i) agriculture and forestry, ii) manufacturing, iii) electricity generation, iv) water, sewage, waste and remediation, v) transportation, vi) information and communication, vii) construction and real estate activities. Each of these economic activities' eligibility is categorized on either its own performance, or because it enables substantial mitigation downstream (for example a manufacturer of wind turbines). Of these 70 activities are also flagged as a 'transitional activity' based on the view of the Technical Expert Group that these activities are critical to the economy in 2050 and contribute to a transition to a net-zero emissions economy by 2050 - but are not currently close to a net-zero carbon emissions level themselves and must significantly enhance their performance beyond the industry average, without lock-in to carbon-intensive assets or processes. Therefore, the screening criteria for these activities will be subject to regular revision, approaching zero over time. These 34 activities cover a range of activities that would be categorized as 'pathway to zero' and 'interim' activities. They include cement, steel and aluminum production under the manufacturing sector, power generation from renewable sources that can be high emitting (such as hydropower, geothermal power, and bioenergy), agricultural production, buildings, and transport. For some of these, the TEG noted that low-carbon solutions are not currently available, but still recognized them as 'transitional activities' and adopted the following two principles to determine screening criteria that can be applied today: 1. Ensuring no lock-in of assets inconsistent with the net zero goals; and 2. Environmental performance well above the sector average. The Taxonomy Regulation requires the European Commission to review all screening criteria regularly and, in particular, to review 'transitional activities' at least every three years. Climate Bonds Initiative CEO Sean Kidney was a member of the Technical Expert Group and Climate Bonds Initiative staff were actively involved in development of the EU Taxonomy.

The draft EU Green Bond Standard requires i) the use-of-proceeds of such bonds to align with the EU Taxonomy where possible, and ii) that the issuer indicates how its strategy aligns with the environmental objectives of the EU Green Bond Standard, as well as their rationale for issuing. The standard does not specify any KPIs or other markers that might be used to describe issuers' strategy.

At national level, the People's Bank of China (PBoC) published the first edition of its Green Bond Endorsed Project Catalogue in 2015, covering the interbank bond market (which accounts for over 90% of green bonds issued in China). In January 2016, China's macroeconomic management agency, the National Development & Reform Commission (NDRC), published a separate set of green bond guidelines covering

corporate bond issuance. China signaled in 2018 that it would exclude 'clean utilization of coal' from the next version of the Catalogue, this has not been confirmed and it is uncertain whether it will.

The Canadian Standards Association is currently developing a National Standard of Canada for Transition Finance, including a taxonomy of activities intended to reduce GHG emissions in line with the transition to a lower carbon economy in Canada, for the following seven priority sectors: i) oil and gas (upstream, midstream and downstream utilities), ii) utilities (energy production), iii) agriculture, iv) forestry, v) transportation (focus on heavy duty vehicles - railways, aviation, trucking), vi) materials (cement, steel, glass), vii) mineral mining. It will build on existing taxonomies and guidance, in particular the EU Taxonomy. The first edition of the Canadian Transition Finance Taxonomy document will be published as a CSA Express Document, targeted for the summer of 2020 (has been pushed to 2021). This document will be used as the basis for the development of a National Standard.

The ISO is also in the process of defining an international green bond standard, which will be known as ISO14030. It is expected that this new standard will be available around 2021. At this stage, it looks like the Standard will reference appropriate local taxonomies, not establish a meta or global taxonomy, and therefore will automatically incorporate any transition principles and resulting transition pathways embedded in those taxonomies. (Climate Bonds Initiative is a member of the relevant ISO14030 drafting committee.)

The International Capital Markets Association (ICMA) hosts the secretariat for the Green Bond Principles (GBP). The GBP identify ten eligible use of proceeds categories for green bonds which cross economic sectors and environmental factors. These are i) renewable energy; ii) energy efficiency; iii) pollution prevention and control; iv) environmentally sustainable management of living natural resources and land use; v) terrestrial and aquatic biodiversity conservation; vi) clean transportation; vii) sustainable water and wastewater management; viii) climate change adaptation; ix) eco-efficient and/ or circular economy adapted products, production technologies and processes; and x) green buildings. There are no specific screening criteria or equivalent for these categories, and they can be applied to activities across the spectrum, including 'stranded' activities. It may thus not be surprising that a number of 'transition bonds' that have been verified as aligned with the Green Bond Principles have attracted criticism (fairness commands to note, though, that some investors have also voiced support of these deals). The GBP do though encourage bond issuers to position information on project selection within the context of the issuer's overarching objectives, strategy, policy and/or processes relating to environmental sustainability. In line with the overall approach of the GBP, they do not give any guidance on the form or levels of ambition that those objectives and strategies should take, though. This may possibly change over time. The terms of reference of a recently formed GBP Climate Transition Finance Working Group (Climate Bonds Initiative is a member) include considering what might be the main points of a credible transition strategy for an issuer and how consistency between the strategy and expenditures could be evidenced, as well as asking what if anything might need to be added to the existing GBP to capture appropriate transition activities. This work will include consideration of relevant transition pathways and metrics. The Working Group is expected to publish some relevant output over the course of 2020. The GBP have also recently launched a working group to look at sustainability linked KPI instruments. While there is no full overlap with the transition question, the two issues are often perceived as closely interrelated: some observers feel that one type of instrument (use-of-proceeds vs KPI-linked) fits one type of bond label (transition or green or otherwise) better or worse. The FSB Task Force on Climate-related Financial Disclosure (TCFD) has produced recommendations to help companies disclose tailored climate related financial information, which will aid investors in determining which companies are most at risk from climate change and how they prepare themselves to manage such risk. Such information will serve as an essential basis for a corporate transition strategy to move to a low carbon, climate adapted footing where its climate-related risks are

appropriately minimized. The TCFD itself identified non-financial sectors and industries which have significant exposure to transition or physical risks related to GHG emissions, energy, or water, but they deliberately do not explore transition pathways that might minimize those risks.

Global Compact produced a roadmap to mainstream SDG investment and SDG bonds to help companies use capital markets to finance their sustainability initiatives and increase allocation of capital to SDGs. Of particular relevance to this discussion is the reference to stranded assets and how an orderly transition away from these assets might be achieved. The roadmap notes that potential options for such assets might be re-purposing older assets, retiring assets, and retraining the workforce. This might inform transition strategies for entities engaged in stranded activities.

The Climate Action 100+ initiative is an investor initiative aiming to secure commitments from the boards and senior management of the world's largest corporate greenhouse gas emitters to take necessary action on climate change. The companies on which the initiative focuses include 100 companies that represent up to two thirds of annual global industrial GHG emissions according to CDP, plus 60 other companies flagged by investors as having significant opportunity to drive the clean energy transition.

The Transition Pathway Initiative (TPI) currently provides carbon performance benchmarks for nine sectors across the full range of categories. Specifically, oil & gas; electric utilities; automobiles; airlines; cement; steel; aluminum; paper; and shipping. These benchmarks include emissions performance trajectories aligned with 3 scenarios: Paris pledges / NDCs; 2 degrees C; below 2 degrees C. Companies across these sectors have been assessed against those benchmarks.

Sustainability Accounting Standards Board (SASB) released its standard in November 2018 covering 77 industries in eleven sectors that include: Extraction and Mineral Processing, several other manufacturing sectors, Financial, Transportation, Infrastructure and Services. The standard's universe of issues covers Environmental, Social Capital, Human Capital, Business model & Innovation, Leadership & Governance. SASB publishes a Materiality Map to identify sustainability dimensions that are likely to affect each of the 11 broad industries. The Map sets out for each industry issues that are not likely to be material, to be material for 50% of firms and issues material for greater than 50% of firms. Companies using the standard produce reports disaggregated by ESG dimension and company activity to aid analysts to compare firms. For instance, oil and gas extraction's GHG report they are their consolidated Scope 1 emissions of the GHGs. There are separate indicators for fugitive emissions and emissions from equipment used for extraction or transport. Companies are asked to discuss their forward strategies to manage Scope 1 emissions and analyze their performance against these targets. SASB's guidance does not specify thresholds or standards, nor any science-based forward trajectory for the firm benchmark performance.

The Energy Transitions Commission (ETC) is a group of leaders from across the energy landscape: energy producers, energy users, equipment suppliers, investors, non-profit organizations, and academics from the developed and developing world. In November 2018, the ETC published its flagship report, "Mission Possible: Reaching net-zero carbon emissions from harder-to-abate sectors by mid-century". Separate more detailed reports cover the cement, steel, plastics, shipping, heavy-duty road, and aviation sectors. The ETC work is particularly useful as source material which other parties can use to develop industry trajectories for decarbonization. Mission Possible's annexes seek to establish trajectories for the six sectors based on projections of demand, opportunities for demand management (at the consumer end) and recycling, and also the technological avenues for decarbonization. For instance, in the cement annex the technologies which are discussed include new cement chemistries, carbon capture, use of biomass as a fuel and the practical challenges in scaling each of these options. The summaries provide a useful summary of the scope for each of the technology to reduce emissions, the timeframe over which the technology

might mature and an indication of the cost to consumers of implementing the technology or business practice.

The UK-based Global Investor Coalition on Climate Change (GICC) has worked with its regional counterparts (Ceres, IGCC, AIGCC) to develop guidance focusing on a number of brown sectors: real estate, construction materials, steel, oil & gas, automotive, electricity utilities, mining. Using a governance and disclosure focused approach, it also articulates the level and pace of transformation that investors would like to see. It mentions current best practice and also alternative technologies / methods to provide insights on future potential and speed of change. It also provides details of the type of information that an entity-level strategy for emission improvement needs to include, in the view of investors. This may inform the development of credible markers for those strategies. Some of these are:

- Disclosures that are in line with the recommendations of the TCFD.
- Evidence at board level confirming that the company's strategy is consistent with the goals of the Paris Agreement, with a strong governance framework which clearly articulates the board's accountability and oversight of climate change risk and opportunities.
- Action to reduce greenhouse gas emissions across the value chain, consistent with the Paris Agreement, which may include short and long-term emission reduction targets, investment plans and other actions that support those reductions, relevant research and development and capital expenditure.

The Paris Agreement Capital Transition Assessment (PACTA) tool, supported by PRI, is a free online tool based on analysis by the 2°C Investing Initiative. The tool, which covers equity and bond issuers, is based on analysis of companies' investment and production plans in both high-emissions activities and low-carbon solutions, both now and in the coming five years. These are then compared with the technology and energy mix which would be consistent with the trajectory towards a given climate scenario. A range of scenarios are available, including the IEA 2°C and 1.75°C scenarios. The output is a 'technology exposure gap', showing the degree to which the investment and production plans within a given portfolio is aligned with a given climate scenario. This alignment analysis may in itself meet the investor's objectives on climate change; it might alternatively be used as a tool to inform deeper analysis in areas/ sectors with misalignment, or for product design.

The Paris Aligned Investment Initiative is led and coordinated by IIGCC with a steering group of leading asset owners. The work to develop concepts, assess methodologies and test portfolios will be undertaken by IIGCC, with the engagement of IIGCC members and input from external experts. The Paris Aligned Investment Initiative will produce, among other things:

- Pathways for Paris Alignment based on emissions, technology, and economic scenarios.
- An assessment of relevant methodologies and approaches for 4 asset classes: sovereign bonds, listed equity, corporate debt, and real estate.
- Testing of the most relevant methods and approaches for aligning portfolios using up to 5 real world portfolios, forecasting implications of aligning to Paris over time against key financial metrics relevant to investors.

The Corporate Knights and the Council for Clean Capitalism released their taxonomy for clean financing for heavy industry, which they called Clean Transition Bonds Guidelines (CTBG), in 2018. The eligible transition categories are carbon intensive, covering oil and gas, energy utilities, mining, metals, and other non-fossil fuel commodities such as cement, chemicals, steel, and smelting. The CTBG make a distinction between eligible transition project categories and eligible clean project categories. Projects in the eligible transition categories are:

- Cleaner fossil fuels extraction with significant reductions in GHG emission intensity
- GHG efficient fossil fuel refining systems
- GHG efficient processes for non-fossil fuel commodities
- Cogeneration from fossil fuels

The CTBG go into some detail by providing concrete eligibility criteria based on minimum levels of GHG emissions reduction, but it is not clear whether the proposed reductions align with Paris Agreement objectives. Furthermore, the GHG emissions considered do not cover scope 3 emissions (i.e., those from using the product), ignoring the most significant part of the sector's emissions.⁵

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⁵ Climate Bonds White Paper <https://www.climatebonds.net/system/tdf/reports/cbi-fin-cred-transitions-092020-report-page.pdf?file=1&type=node&id=54300&force=0>