THE ROLE OF TRANSITION PLANS IN THE UK'S PATHWAY TO NET ZERO

Final Technical Report

Report for: The Climate Change Committee (CCC)

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1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Climate Change Committee (CCC) is planning to publish a **report outlining the role businesses play in shaping the UK pathway to net zero** and assessing policy levers for accelerating the positive actions businesses can take. It will also assess the UK Government's plans to require UK listed companies and financial institutions to publish "net zero transition plans" which were announced at COP 26 (HMG, 2021c).

To inform its assessment and recommendations, the CCC commissioned Ricardo to provide **an independent assessment of some of the key considerations and principles** which those designing transition plan standards and the accompanying monitoring & enforcement framework should keep in mind, and to:

- Set out what a transition plan should include,
- Assess the options for monitoring and governing transition plans, and
- Appraise how transition plans might ensure appropriate emissions reduction ambition.

This report **summarises the findings and conclusions** of our research, which was completed in February and March 2022, and focussed on addressing a series of research questions and sub-questions set by CCC.

The main output of the work is intended to be **a "think piece" that can be shared** with the high-level Transition Plan Taskforce that has recently been set up by the UK Government to help develop a 'gold standard' for transition plans and associated cutting edge metrics, and which is due to report back by the end of 2022.

The report provides a fresh viewpoint on the structure and content of transition plans that the CCC can draw on, when undertaking its own internal analysis of existing frameworks and the future role of transition plans.

1.2 RESEARCH QUESTIONS

The four key questions the project that this project sought to answer are:

1. Given the current UK and global context, what are the **broad risks and opportunities** presented by the UK Government's plan to require transition plans?
2. What could a **high-quality transition plan standard** look like for companies and financial institutions which operate in the UK?
3. What are the main **mechanisms** that could ensure transition plans have appropriate ambition?
4. What **monitoring, governance and enforcement** should accompany the transition plans requirement?

Our approach to addressing these research questions involved a combination of:

- A review of the background literature and a selection of the emission reduction plans published by FTSE listed companies in their annual reports to shareholders, sustainability reports, or websites.
- A structured dialogue with a selection of stakeholders during a practitioner's webinar with breakout sessions for different groups of stakeholders and some follow up discussions by email.
- Using an analytical framework based on our experience of supporting UK companies as they have developed emissions reduction targets, net zero roadmaps, and climate emergency action plans.

The analytical framework (see Annex 6) was used to systematically:

- Gather evidence from existing corporate transition plans and to **identify what to review and extract** in the compressed timelines
- Guide the evidence assessment and synthesis of findings on **defining the key components** of a high-quality transition plan
- Develop an outline for transition plan standard that can be presented to practitioners for **validation and refinement**
- Ensure our recommendations for the transition plan standards are **clearly robust and grounded in experience and evidence.**

In the following sections, we set out a summary of the key findings of each of the four research tasks in turn, then our proposed outline for a transition plan standard, and an outline of remaining evidence and knowledge gaps. The annexes include lists of sources referenced and company emission reduction plans reviewed, a brief overview of the research methodology, explanation of abbreviations and a glossary of key technical terms.

1.3 MAIN RECOMMENDATIONS AND FINDINGS

Q1: Given the current UK and global context, what are the broad risks and opportunities presented by the UK Government's plan to require transition plans?

Findings and Observations:

- The UK Government's proposal for **the mandatory disclosure of Net Zero Transition Plans** is based on the Guidance on Metrics, Targets, and Transition Plans issued by the Taskforce on Climate-related Financial Disclosures (TCFD), which was founded in 2016 after COP 21 in Paris.
- These proposals were **not part of the TCFD's original recommendations** for climate related financial disclosures in corporate annual sustainability reports, which are currently in the process being implemented via secondary legislation (and regulations) that will come into force in April 2022.
- The UK Government's announcement that UK would move towards the mandatory publication of corporate net zero transition plans **came after a year of growing international pressure for the UK to take a lead in taking action** to limit global warming to 1.5°C above pre-industrial levels during the UK Presidency of COP26. The plan emerged into the media spotlight in early 2021, as part of an investor led campaign to strengthen accountability of corporate net zero commitments
- **A number of organisations have published frameworks for transition plans**, but these set out different visions of what it should contain and how it will be structured. As a result, **many companies are unclear which transition plan framework to adopt or which elements to include in them.**
- The **Net Zero Transition Plan Standard provides an opportunity** to:
    - Drive changes in corporate behaviour to ensure the UK meets its targets.
    - Send a clear signal to investors that the UK is open for low-carbon investment.
    - Increase engagement and support for the development of net zero transition plans.
    - Incentivise companies and supply chains when they achieve their target reductions.
- There are also risks that they **may not provide sufficient insight** into the actions needed to reduce emissions, **be sufficiently open, transparent and comprehensive**, ensure a **just transition**, encourage the **development of new goods and services** or consider adaptation and biodiversity.

Conclusions:

- A High-Quality Transition Plan Standard needs to **be flexible enough** to be applied to UK listed companies in all sectors. It should also **disclose the information needed by stakeholders** to
    - Make informed and sustainable investment decisions.
    - Challenge companies to increase their ambition for climate action.
    - Monitor corporate alignment with national and sectoral decarbonisation.
- A high-quality corporate net zero transition plan could be developed by drawing together key technical elements from existing national and international standards. However, there is a gap in the standards around net zero / climate transition investment planning that would need to be filled.
- One way of achieving these objectives is **to design net zero transition plans so they can be used as finance raising tools by UK businesses** to raise additional capital needed to innovate business models, develop new goods and services and decarbonise their processes on the sustainability bond market. This approach addresses the gaps in international standards around corporate net zero / climate transition investment planning and financing mechanisms, whilst developing an open, transparent and robust investment plan that authors have called for all listed companies to publish.

Q2: What could a high-quality transition plan standard look like for companies and financial institutions which operate in the UK?

Findings and Observations:

- Only 61% of companies presented an analysis of how their markets are expected to change over the 25 to 30-year life of the plan, whilst **only 56% provided operational details of offsetting policies**.
- On average, the **corporate transition plans reviewed mentioned 64% of the 36 key components of a transition plan**, but only 53% provided enough detail to enable an assessment of their quality.
- **There were examples of good practice in most plans we reviewed**, and that the availability of a high-quality net zero transition plan that draws on these examples is likely to encourage practitioners to adopt best practice in terms of the topics covered in plans and the level of detail presented.
- Most plans highlighted Science Based Targets and a target date for achieving net zero, but only a small number set out plans to reach the longer-term target in sufficient detail. It was difficult to tell whether the most popular **short-term measures had been greenwashed to demonstrate progress**.
- Most of the transition plans we examined included news stories detailing the outcomes of previous projects but **provided very little detail on planned investments for the next reporting period**.
- Most of the metrics proposed in previous work are sensitive to changes in level of activity or differences in Scope 3 boundaries, and **a meaningful intercompany comparison can be difficult to make**, where the proportion of the value chain directly controlled by companies being compared is different.
- However, we identified metrics that could be calculated from the data already collected by companies for Streamlined Energy and Carbon Reporting (SECR), Climate Change Agreements (CCAs) and UK ETS membership and that **could be standardised, aggregated and used to compare plans**
- Some companies are raising additional finance on the Sustainable Bond Market to accelerate their transition to net zero. These companies must meet the LSE **requirement to prepare a transition framework that is aligned** to guidelines in the Climate Transition Finance Handbook (ICMA, 2020).
- Financial companies are starting to check whether the transition plans of the companies they hold investments in, meet the "Hallmarks" of a credible company transition (CBI,2021), and **may divest their holdings if companies do not provide the information needed to assess carbon exposure**.
- The **portfolio management benchmarks being developed in the financial sector could be used in all sectors** to monitor the level of capital investment in emission reduction projects, the proportion of revenues that are from green activities and the degree of company balance sheet decarbonisation.

Conclusions:

- The **lack of a defined structure for the presentation of net zero transition plans often results in inadequate disclosure** as key information competes for space with wider issues around the aftermath of Covid-19, reducing environmental footprint and addressing sustainable development goals.
- As the UK net zero aligned financial centre develops, **financial institutions and investors will expect all listed companies to have high quality transition plans** that enable them to meet the requirements of ISO 14097: 2021 to monitor emissions and take action to encourage companies to reduce emissions. The pressure for climate action will increase as sustainability metrics are deployed.
- **A high-quality transition plan should focus on presenting the information needed by investment market** to raise equity finance or debt finance on the sustainable bonds market in a credible, open, transparent and accountable way that other stakeholders can also access.

Q3: What are the main mechanisms that could ensure transition plans have appropriate ambition?

Findings and Observations:

- **Most companies set emission reduction targets in terms of Scope 1 & 2 emissions**, and some have Scope 3 reduction targets. International, national & sector pathways are defined in terms of Territorial (i.e. Scope 1) emissions, so this is the best basis for any pathway comparison. It is difficult to make like for like comparisons between companies on a combined scope 1,2 & 3 basis, as **the categories of Scope 3 emissions covered by targets is not yet standardised**.
- International, national & sector pathways are defined in terms of Territorial (i.e. Scope 1) emissions, so this is the best basis for pathway comparison, and a useful comparison is only possible, if there is an **agreed set of international metrics and pathways for that particular type of company.**
- Using the IEA pathways to set both short and longer-term targets, **resulted in considerably lower levels of ambition** than required to meet the UK's 6th Carbon Budget target and Net Zero pathway.
- **Using the IPCC 1.5oC Global Pathway is also results in lower levels of ambition** unless UK Carbon Budgets and sector pathways are factored in - as has been done for local authorities.
- The benchmarking approaches used by existing standards and frameworks for target setting are **grounded in robust methods of carbon accounting** and they could be a useful tool for reducing the emissions provided they can be persuaded to factor national pathways into their products and to standardise the categories of Scope 3 emissions covered by including all Scope 3 categories.
- Due to the way **national models aggregate up emissions data**, it would be difficult for companies to derive benchmarks from them. However, with some additional processing, it should be possible to create benchmarks that could be used check the alignment of corporate net zero transition plans.
- **Having a single pathway for every company in a supply chain is not realistic**, given that there will be early and late adopters, as well as market leaders and market followers, particularly where supply chains are spread over many sectors and countries with different decarbonisation rates.
- A wide range of other approaches could be used to ensure alignment with UK pathways and to increase emissions reduction ambitions. The options examined would enable the level of emissions or reduction targets to be compared at product, activity, site, company and supply chain levels.

Conclusions:

- **A combination of indicators may be needed to send a clear alignment signal** to companies, and these could include either a minimum emissions reduction and/or minimum carbon price requirements, and indicators of public procurement eligibility, carbon intensity and compliance with carbon budgets.
- A new **environmental label that indicates the level of emissions reduction ambition** that a company has relative to its sector benchmark, should be included in a transition plan standard.
- A range **of tools could be developed to help companies set emissions reduction targets** that aligned with the UK Net Zero with sector pathways, including a carbon budgeting tool, cutting edge benchmarks, new carbon budgeting standards, and new trading arrangements for carbon budgets.
- Enabling **the benchmarking methods used by financial analysts and other stakeholders to drive up the levels of ambition** reported in company net zero transition plans was an attractive option, although we recommended that a range of options should be explored further after this project.

Q4: What monitoring, governance and enforcement should accompany the transition plan requirement?

Findings and Observations:

- Under current proposals for the reform of corporate auditing and reporting **listed companies will be required to publish annual Resilience Statement assessing the company's prospects and addressing challenges to its business model over the short, medium and long-term**, including risks posed by climate change. A new Audit, Reporting and Governance Authority is proposed.
- The **FCA expects investment product providers to determine the correct categorisation for their products and may challenge firms' claims** during the regulatory engagement and supervisory processes. The FCA has powers of enforcement under the UK Benchmark Regulations 2018.
- There are **at least four different data aggregation processes in the current system of corporate reporting of emissions**, and investment analysis, before carbon metrics are presented to investors.
- There are **a range of tools that could be used to help directors to assess their level of ambition** relative to their peers and national and sector targets that could be used to raise levels of ambition.
- **A combination of different visual indicators is increasingly used to nudge consumer behaviour towards more sustainable options**, rather than conveying information on performance.
- With careful design, v**isual indicators can act as a transparency tool for consumers, citizens and investors**, without necessarily placing a significant additional burden on companies or government.
- The degree of difficulty and cost to government of different **monitoring and governance options depend on a range of service and product design considerations**, but a conventional "propose and review" option potentially involved the least amount of additional effort on the part of the company.
- A combination of methods is normally used to track progress against delivery of time critical actions and a review of planned verses actual delivery of plans plus random quality assurance audits would **provide considerable insight into the progress of individual companies and each sector overall**.
- In a business reporting context, **visual indicators can also act as a window into the environmental performance** of a company's operations, brands, products and services where data is not disclosed.

Conclusions:

- M**ost of the components required for the monitoring, governance and enforcement of the transition plan requirement, were already either in place, or under development**. The remaining issues that need to be considered were how best to verify the data published in transition plans, to raise business ambition, track delivery and to use transition plans as a transparency tool.
- **Current data aggregation processes do not lend themselves to the task of monitoring of transition plan** implementation and need revision to enable the development of cutting-edge metrics.
- A **combination of voluntary certification and the inclusion of a requirement to comply with the new standard within international accounting standards and corporate reporting regulations** might be needed to encourage widespread adoption and levels of compliance with the new standard.
- The progress tracking process **should involve an element of independent assurance that goes beyond the application of normal commercial Quality Management and Assurance Systems**. Whilst a self-regulatory approach may seem more cost-effective in comparison to external verification, the latter is probably required to **resolve the growing problem of greenwashing of annual reports**.
- An **extra section could be added to the transition plan containing a schedule of authorised indicators**, which can be used in business planning and by investment firms for benchmarking.

1.4 AN OUTLINE FOR A NET ZERO TRANSITION PLAN STANDARD

One of the tasks undertaken by the research team was the preparation of an initial outline for a transition plan standard that would address the need of practitioners to have clear guidance on the structure and contents of a high-quality net zero transition plan. This outline needed to reflect the good practice we found in corporate reports, whilst **shifting the focus towards presentation of forward-looking key performance indicators**.

The starting point for our outline was the recommendation that a high-quality transition plans should be designed so they can be used as **finance raising tools to raise the funds needed by listed companies** to implement them and would be included in the prospectuses issued with the financial instrument traded in sustainability bond market. Accordingly, our outline was designed to align with the requirements of the ICMA Climate Transition Finance Handbook 2020, and the bonds available on the London Sustainable Bond Market**.**

Our outline transition plan standard would **guide companies through the process of developing an investment action plan in the form of a seven-slide sales pitch to investors**. However, we expect that this sales pitch would be accompanied by a supporting investment prospectus with detailed information for investors. The slide pack also could be used to present the business case for investment in the corporate boardroom, in situations where the company is able to fund the transition plan out of internal resources.

The transition plan would make **use existing management, audit/ survey and sustainability datasets to present the company's net zero transition plan in a way that addresses the lack of a clear storyline in current plans**. It would also include a monitoring and evaluation framework based around the use of a **set of size independent metrics that could provide a good indication of how far a company has progressed in its decarbonisation journey**. Collectively these metrics would enable intercompany comparisons to be made, particularly for businesses in the same sector, and support benchmarking of company performance.

We also outlined the possibility of using **existing national net zero pathway models to create a composite index for different sectors** that would enable investors to see how well aligned a business is with sector pathways. Companies could then **be encouraged to calculate their index value and have it verified by their auditors** prior to publication. This option would not require the publication of any confidential information.

The **supporting data could be collected as part of annual submissions to regulatory bodies and random audits** commissioned to ensure that companies are not greenwashing progress of their transition journey.

We also have provided **a mapping between our outline net zero transition plan standard and the ISO Harmonized Structure for management system standards** that illustrates how our design concept could be translated into an International Standard (ISO) with the addition of a small number of additional elements.

Finally, it should be noted that our outline for a net zero transition plan standard was intended to illustrate how a net zero transition plan could be structured in a different way to existing frameworks, in order to create a more open, transparent and integrated corporate transition plan. Our outline **is intended to stimulate a discussion around the future role of transition plans and their potential to address the information needs of multiple stakeholder groups**, whilst highlighting many topics where further research is needed.

In particular, further research is needed to assess:

- Whether transition plans should it be aligned to UK national or international sector pathways.
- Where the transition plan standard would sit in the international standards development framework.
- The legal implications of treating Net Zero Transition Plans as Financial Instruments.
- How the proposed investment plan approach could be adapted for use in the Financial Sector.

These remaining evidence and knowledge gaps are briefly discussed in Section 6.6, where we outline some potential avenues for further research and development work that could address these outstanding issues.

2. INITIAL ANALYSIS OF THE UK GOVERNMENT'S PLAN

The aim of this task was to address the research question: "Given the current UK and global context, what are the broad risks and opportunities presented by the UK Government's plan to require transition plans?"

Our approach involved firstly undertaking a **targeted review of the background literature on the UK and global context** to the development of business emissions reduction reporting, the UK Government's plan for mandatory transition plans and standards for corporate reporting and target setting. Secondly, we prepared a timeline of the key developments over the last 5 years and analysing how they related transition plans. Finally, we identified the **high-level risks and opportunities that the UK government's plan presents to ambitious climate action**, and the high-level conditions need for these opportunities to be realised.

The key observations that we made during the review process include:

- The UK Government's proposal for **the mandatory disclosure of Net Zero Transition Plans** is based on Guidance on Metrics, Targets, and Transition Plans issued by the Taskforce on Climate-related Financial Disclosures (TCFD), which was founded in 2016 following COP 21 in Paris.
- These proposals were **not part of the TCFD's original recommendations** for climate related financial disclosures in corporate annual sustainability reports, which are currently in the process being implemented via secondary legislation (and regulations) that will come into force in April 2022.
- The UK Government's announcement that UK would make the publication of net zero transition plans mandatory for asset managers, regulated asset owners and listed companies was made at COP 26. It **came after a year of growing international pressure for the UK to take a lead** in ensuring that global leaders took action to limit global warming to 1.5°C above pre-industrial levels.
- Several organisations have published proposals for what net zero (or climate related) transition plan should contain and how it should be structured, since the publication of TCFD's Guidance. **Each presents a different vision for what the transition plan should contain and be structured**.
- There is **no consensus as to what a High-Quality Transition** Plan should looks like, and therefore there is opportunity to define a new standard that will increase corporate ambition for climate action.

The main findings of these research activities include:

- The Net Zero Transition Plan Standard provides an **opportunity to drive changes in corporate behaviour to ensure the UK meets its targets**, send a clear signal to investors that the UK is open for low-carbon investment, increase engagement and support for the development of transition plans and incentivise companies and supply chains when they achieve their target reductions.
- There are also risks that they **may not provide sufficient insight** into the actions needed to reduce emissions, **be sufficiently open, transparent and comprehensive**, ensure a **just transition**, encourage the **development of new goods and services** or consider adaptation and biodiversity.

The main conclusions of this research were that:

- A High-Quality Transition Plan Standard needs to **be flexible enough** to be applied to UK listed companies operating in all sectors and all locations around the world and **disclose the information needed by different stakeholder groups** to make informed and sustainable investment decisions, challenge companies to increase their ambition for climate action and monitor corporate alignment.
- A high-quality corporate net zero transition plan could be developed by **drawing together key technical elements from existing national and international standards.** However, there is a gap in the standards around net zero / climate transition investment planning that would need to be filled.
- One way of achieving these objectives is **to design net zero transition plans so they can be used as finance raising tools by UK businesses** to raise additional capital needed to innovate business models, develop new goods and services and decarbonise their processes on the sustainability bond market. This approach addresses the gaps in international standards around corporate net zero / climate transition investment planning and financing mechanisms, whilst developing an open, transparent and robust investment plan that authors have called for all listed companies to publish

More details of the results of our analysis of this research question are presented in the following sections.

2.1 TARGETED REVIEW OF THE BACKGROUND LITERATURE

Our approach to **reviewing of the background literature on the UK and global context** involved, firstly completing an **initial scoping exercise** to map out volume of literature published, and the **collation of policy papers and reports** in the field of business emissions reduction reporting over the last 5 years. Secondly, we conducted a **backward chaining search** for key analytical reports underpinning the definition of a Net Zero Transition plan and a series of **key word searches** for academic papers and analysts reports. Finally, we produced a concise report containing **a synthesis of the key findings** of the research.

Due to the large volume of literature published in this fast moving and developing field, and the timeframe set for completion of the work, our review was **limited to reading executive summaries**, noting any relevant findings and conclusions, and reviewing associated references, which were then obtained and reviewed.

During the research process, we captured around 500 documents of which 40 were identified as being key documents for our review process, and a further 80 are referenced as containing supporting analysis. To improve readability, we have **only referenced the key documents that shaped our thinking** in each area but acknowledge that a considerable number of other authors have contributed ideas to these documents.

The key observations that we made during the review process include:

- The phrase "**Net Zero Transition Plan**" first appears in the CCC's progress report to the UK Parliament in June 2020 (CCC, 2020e) in the context of developing a NDC that is **based on the pathway required to reach the Sixth Carbon Budget and net-zero GHG emissions by 2050.**
- The net zero transition planning process **extends the work done** in developing net zero pathways, roadmaps and targets, low carbon transition plans, climate transition plans and emissions reduction plans to UK nations, regions, local areas, sectors and businesses to reaching net zero by 2050.
- A net zero transition plan **can be incorporated into climate action plans** that address the UN's sustainable development goals and **business sustainability plans** that are designed reduce the environmental impact and increase value and profitability by circular economy approaches.
- In Scotland, the concept has been **extended to create Just Transition Plans** that are co-designed and co-delivered with business, trade unions, communities and society and designed to reach net zero by 2045, build a climate resilient economy and create a fairer, greener future for all (SG, 2021).
- Internationally, there are many examples of just, net zero, climate transition plans being developed at transnational, national, and local area level that UK companies will need to align with this will include **allocating investment to decarbonising up-stream and downstream supply chains**.

The key findings of the research include that a **High-Quality Transition Plan Standard** needs to be:

- **Flexible enough** to be applied to UK listed companies operating in all sectors and all locations around the world, and ideally capable of be used by smaller companies and other organisations
- Open and transparent enough **to enable stakeholders in different countries to check alignment with their national plans** for sustainable development, decarbonisation of business and society and adaptation to reduce the risks of climate change, as well as international net zero commitments.
- Technology, sector & accountancy standard neutral, whilst aligning with recent developments the international accounting and reporting, carbon auditing and quality assurance standards.

The main conclusions of this research were that **Net Zero Transition Plans should:**

- **Be designed to be finance raising tools that UK businesses can use to raise any additional capital needed** to innovate business models, develop new goods and services, decarbonise large carbon intensive processes, and address the challenges of exiting coal, oil and gas production.
- Present an **investment led implementation plan** including financially robust & credible proposals, aggressive but possible corporate targets, focus on actionable steps and business model innovation.
- Be value based, **profitable for investors and provide a just transition** for workers.
- **Place as little extra reporting burden on companies as possible.**

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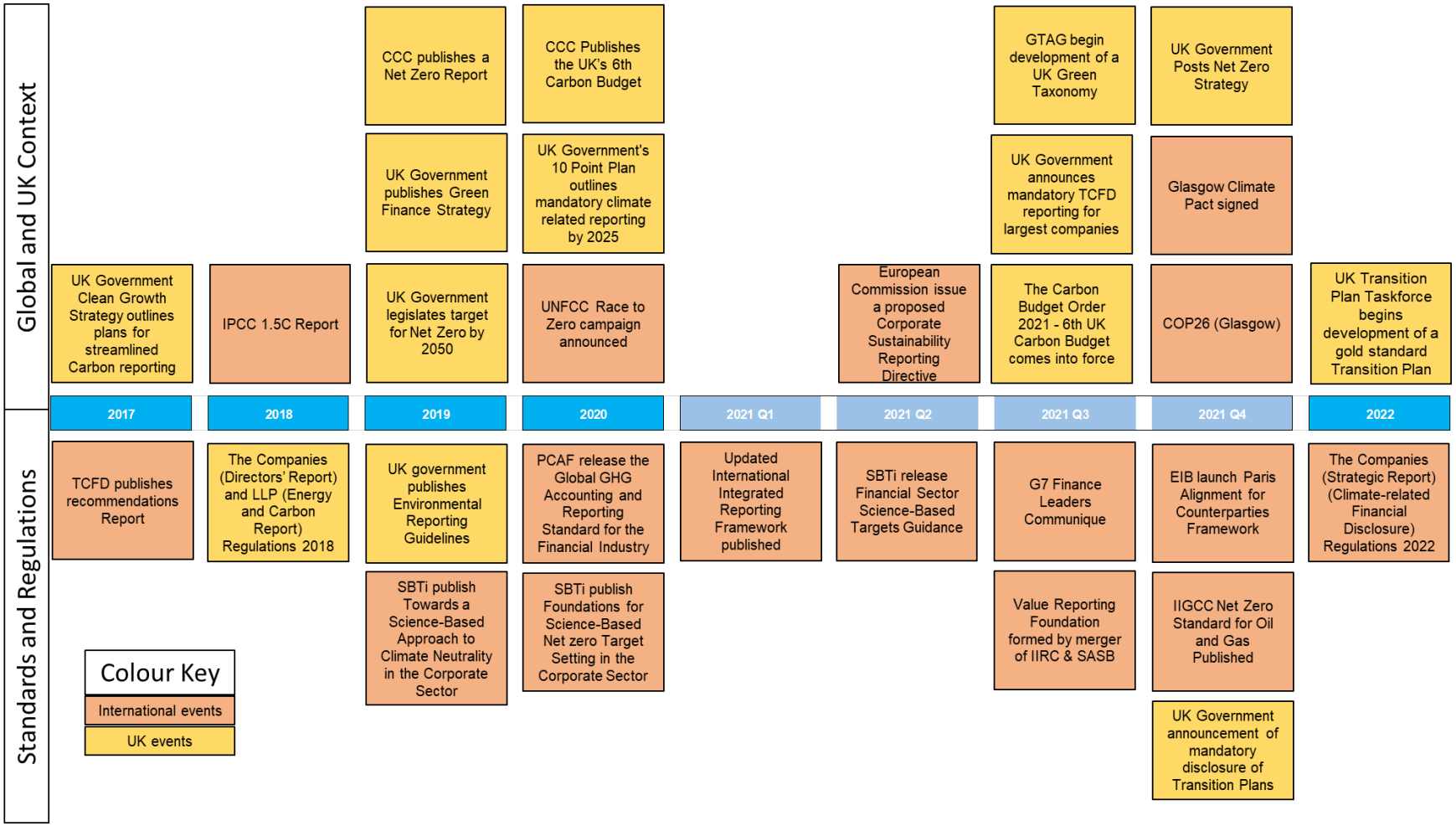
2.2 TIMELINE OF DEVELOPMENTS OVER THE LAST FIVE YEARS

Figure 1 below sets out the **timeline of developments over the 5 years leading up to the UK Government's announcement** of its proposal for the mandatory disclosure of Net Zero Transition Plans by UK listed companies at COP 26 in Glasgow, starting with the publication of the Taskforce on Climate-related Financial Disclosures (TCFD) recommendations in June 2017 and ending with the establishment of the UK Transition Plan Taskforce in April 2022. It should be noted that we have broken down the time into quarters for 2021, to enable the increased activity in the run up to COP26 to be displayed more clearly.

Figure 1 Timeline of developments over the last five years



2.3 RELATIONSHIP OF TRANSITION PLANS TO RECENT DEVELOPMENTS

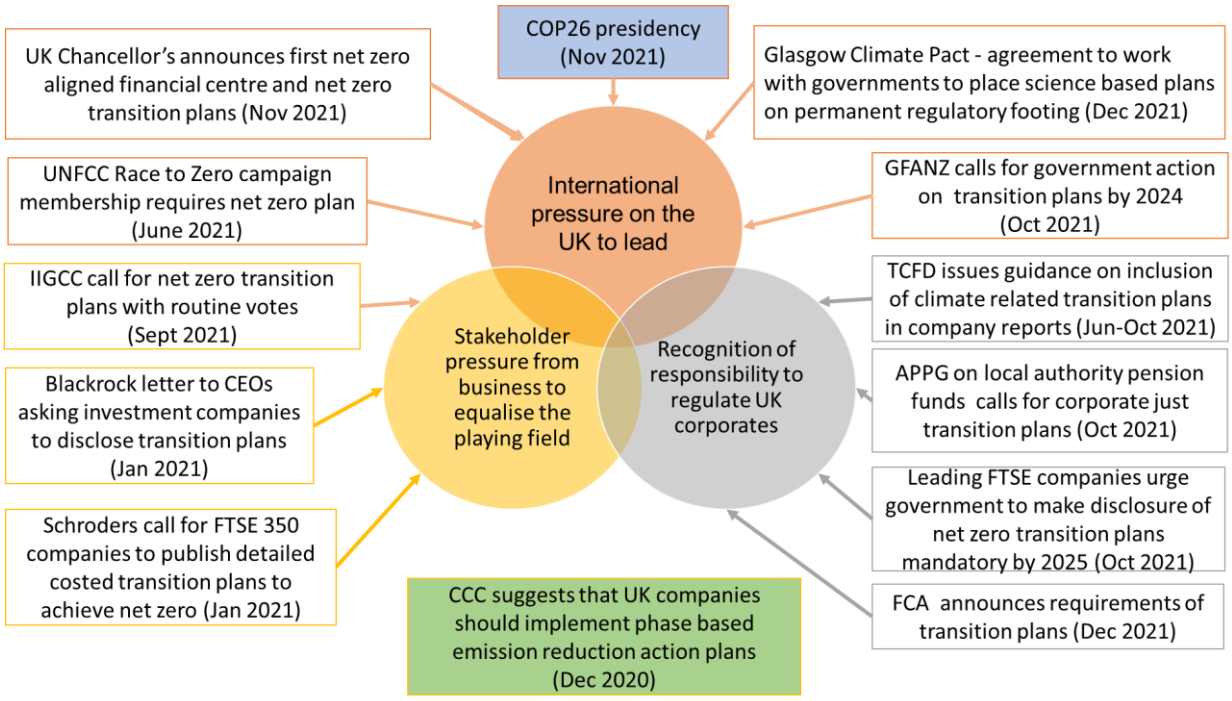
In October 2021, the UK Government's Green Finance Roadmap (HMT, 2021) outlined the expectation that all listed companies and large asset owners to disclose in line with the TCFD recommendations made in 2017 (TCFD, 2017). An announcement was then made at COP 26 that UK would move towards making publication of net zero transition plans mandatory for asset managers, regulated asset owners and listed companies. It came after **a year of growing international pressure for the UK to take a lead** in ensuring that global leaders took action to limit global warming to 1.5°C above pre-industrial levels during the UK Presidency of COP26.

Figure 2 below highlights some of the **high profile calls for action, decisions and publications** that preceded the UK Government's announcement at COP 26, including the CCC's recommendation to UK Government in December 2020 that, as part of the key Net Zero transition principles for business, UK companies should be setting and achieving phase-based emission reduction action plans (CCC, 2020). In addition to the action highlighted on Figure 2, many other actors played a key role in building momentum for this policy development, resulting in a large number of articles that we could not fully review in this study.

Whilst the concept of planning for a transition to net zero existed before the publication of this CCC advice, and a number of major companies had committed in 2019 to achieving net-zero emissions by 2050 as part of the Climate Action 100+ initiative (PRI, 2017), the **concept of the mandatory publication of a net zero transition plan** as part of corporate reports, appears to have emerged into the media spotlight in early 2021, as part of an investor led campaign to strengthen accountability around corporate net zero commitments.

This **campaign led to the TCFD publishing new guidance** on the inclusion of transition plans in company reports (TCFD, 2021), and triggered calls from leading UK FTSE companies, investors and Parliamentarians for mandatory net zero transition plans, which the UK Government responded to positively at COP 26.

Figure 2 Calls for action, decisions & publications prior to the UK Government's announcement



A number of organisations have published outlines for a net zero (or climate related) transition plan should contain, since TCFD published its Guidance on Metrics, Targets & Transition Plans (TFCD, 2021a & b), including: the Children's Investment Fund Foundation (CIFF, 2021, the Climate Safe Lending Network (CSLN, 2021), Institutional Investors Group on Climate Change (IIGCC, 2021a & c), the Carbon Disclosure Project (CDP. 2021 & 2022) and the International Financial Reporting Standards (IFRS, 2021) and the Scottish Government (SG, 2021), who have issued advice on the structure and contents of a Just Transition Plan. In addition, other organisations such as GFANZ, CA100+, TPI, ISSB and ACT issue advice on transition planning.

Each of **these sets out different visions and advice** on what a net zero transition plan should contain and how it should be structured. Our analysis of these documents (Table 1) is that there is considerable diversity in approach, and no consensus on what a High-Quality Transition Plan looks like. In addition, the feedback

received by TCFD to in consultation on its transition plan proposals, indicated that 51% of respondents were "unclear which transition plan framework to apply or which elements to include in them" (TCFD, 2021c).

Table 1 Summary of the approaches, structure and content recommended by selected authors.

Author	Approach	Structure & Contents
TFCD	Transition plans should be disclosed as part of and aligned with an organization's broader strategy to address climate-related risks and opportunities	Governance, Strategy, Risk Management and Metrics and Targets. Transition plans should describe current capabilities, technologies, transition pathways, and financial plan, and may describe significant limitations, constraints, and uncertainties.
CIFF	Outlines the essential components of a climate action plan, which are designed to change business processes to reduce company carbon footprint, using efficient energy management, sourcing new low carbon energy, decarbonisation transport fleets & supply chains, R&D and minimal use of high-quality carbon offsets	8 sections: Short-term targets: 5-year action plan and a 5-10-year capex plan; Absolute Scope 1-3 emissions reduction of 7-8% per year to 2030; Phase out fossil fuel use and production, with no financing of new supply; Executive compensation, strategy and lobbying aligned with plan; Necessary capex commitments; End deforestation, credible use of offsetting only if strictly necessary; Independent auditing of emissions; Annual performance reporting to shareholders. Includes suggested approaches for 6 sectors with inter-company comparisons.
CSLN	A transition plan is a tool for turning long-term climate targets into practical actions. A cultural and strategic commitment to reforming everyday business processes, using a whole organisation approach.	7 key sections: Governance & organisational development, measurement, disclosure & reporting; net zero & Paris-aligned targets; decarbonising balance sheets and economies; stopping flows of finance to fossil fuels and deforestation; financing Innovation & drawdown; agency & broader influence.
IIGCC	A Net Zero Standard that allows a meaningful comparison of the credibility and adequacy different company strategies (in the Oil & Gas Sector).	10 indicators covering: Ambition; Long-term, medium-term and short-term targets; Decarbonisation strategy; Capex alignment, Climate policy engagement, Climate Governance; Ensuring a Just Transition; TCFD Disclosure, with external assessment
CDP	A climate transition plan is a time-bound action plan that clearly outlines how an organization will achieve its strategy to pivot its existing assets, operations, and entire business model towards a trajectory aligned with the 1.5oC target	8 sections: Governance; scenario analysis; financial planning; value chain engagement & low carbon initiatives; policy engagement, risks & opportunities; targets; scope 1,2 & 3 accounting with verification. Transition plans should set near-term science-based targets, and a long-term target with verifiable and quantifiable key performance indicators (KPIs).
IFRS	Presents a prototype accounting standard, which integrates the requirement to disclose transition plans into one section of the TCFD disclosures covering the assessment of the impact of climate-related risks and opportunities on management strategy & decision making.	4: sections: The company should describe how it plans to achieve any climate-related targets, including how these plans will be resourced, the processes for review of those targets. how it is advancing R&D related to climate-change mitigation and adaptation and what adaptation and mitigation efforts it is undertaking, including adoption of new technologies, and the extent of its reliance on offsetting strategies.
SG	Just Transition plans will be evidence based and co-designed to ensure all partners are empowered to engage, and action is fair and co-ordinated.	4 sections: Context; Vision; Action Plan; Monitoring & Reporting. The plans will outline how the particular area will reduce its emissions in line with climate change targets and act as a guiding document for public and private sector activity.

Our analysis suggests that these **proposals are based around four competing design concepts: an accounting and reporting standard, an action planning tool, an investment plan and a standardised technical methodology**, which is why there is no consensus as to what a Transition Plan Standard looks like.

These authors are extending approaches that are largely defined in existing standards. Table 2 sets out a selection of international (ISO) and national standards in the field of GHG emissions measurement, management and reporting, emission reduction planning and performance verification that could be drawn on to define these different design concepts in a high-level transition plan standard for UK corporate organisations.

ISO Guide 84: 2020 sets out ISO's Guidelines on the how standards should address issues surrounding climate change and the different approaches adopted in the 70 + standards in its ISO 14000 series, which is intended to ensure the consistency of future standards. This Guide notes that **most standards do not address the issue of financing mechanisms for the implementation of climate change mitigation and adaptation measures**, although ISO is in the process of publishing standards for verification of Green Debt Instruments.

Table 2 A selection of available standards that support transition planning.

Design concept	Relevant Standards
Accounting and reporting standards	GHG Protocol Corporate Accounting & Reporting Standard ISO 14064-1:2019 (Organisation Level GHG Inventories).
Action planning tool	ISO 14001:2015 Environmental Management Systems ISO 14097:2021 (GHG Management for Green Finance)
Investment plan	ISO 55010: 2019 (Financial planning for asset management.) ICMA Climate Transition Finance Handbook (Dec. 2020)
Technical methodology	ISO 14060 series, ISO14031 (Environmental Performance evaluation) PAS 2060 (Carbon Neutrality), PAS2080 (Infrastructure companies) PAS 7340 & PAS 7341:2020 (Sustainable Finance Principles & Practice)

Whilst ISO also publishes guidance on financial planning for asset management in its ISO 55000 series of standards, this guidance has not yet been applied specifically to the implementation of emission reduction measures. Although ISO has published transition planning guidance on the implementation of standards (e.g. ISO, 2016), it has not yet developed an ISO standard for corporate climate transition planning, although the requirement to undertake action planning to achieve environmental objectives is built into ISO 14001:2015. Hence, we concluded that **a high-quality corporate net zero transition plan could be developed by drawing together key technical elements from international standards and associated guidance.**

Many organisations currently provide sustainability reporting frameworks, standards and metrics, and whilst there are many commonalities, there are also differences with some focusing on non-financial standard-setting, some on creating a framework for non-financial information, and others on frameworks for climate-related disclosures (IFRS,2020). To address this issue, the IFRS has set up a **new International Sustainability Standards Board (ISSB), which is in the early stages of drafting new Guidance on the "General Requirements for Disclosure of Sustainability-related Financial Information"** (IFRS, 2022).

As the preceding analysis outlines, the UK announcement of the development of a Transition Plan Standard was made in the context of evolving international initiatives and standards for corporate disclosure, and the development of the UK Green Taxonomy and the introduction of mandatory TCFD disclosures for listed UK companies. The UK is currently ahead of the global moves on the disclosure of company transition plans, but **it is important that the new UK transition plan standard builds on and aligns with existing and anticipated national and international requirements and standards for corporate disclosures**. However, at this stage, there is considerable flexibility over how these components are integrated into the new standard.

2.4 ASSESSMENT OF HIGH-LEVEL RISKS AND OPPORTUNITIES

During our literature review, we identified a number of **high-level risks and opportunities** that the UK Government's plan to require transition plans presents to ambitious climate action, which we have summarised in the following table under two broad categories: policy & governance and business & economic risks:

Table 3 High-level risks and opportunities that UK Government's plan presents

Category	Risks & Opportunities
Policy & Governance	There is an opportunity to use Transition Plans to **send a clear signal that the UK is open for low-carbon investment,** and to encourage private investment at a time when it is needed to support the UK's economic recovery from the COVID-19 crisis. (CCC, 2020d)
	There is an opportunity to use Transition Plans **to drive changes in corporate behaviour** to facilitate the flow of capital to those leading the net-zero transition and to increase engagement and support for the development of net zero transition plans (Eunomia, 2021)
	There is an opportunity to use Transition Plans **to incentivise companies and their supply chains** when they achieve agreed emissions reductions targets (WBCSD, 2022)
	There is an opportunity to specify **how data should be aggregated and used track corporate performance** in relation to progress towards net zero, now and in the future

Category	Risks & Opportunities
	There is a risk that Transition Plans **may not provide sufficient insight** into the specific actions that companies will take to reduce their Scope 1 & 2 emissions, or the bottom-up modelling that underpins their proposed pathway to net zero (CDP, 2021).
	There is a risk that Transition Plans may **not provide the detailed information needed** by investors, policymakers, employees, civil society and the businesses themselves, to enable underperforming supply chains to be challenged. (OECD,2021; CDP,2021).
	There is a risk that Transition Plans **may cause additional and unpredictable costs** to government of producing guidance, familiarisation within first year of implementation, monitoring and enforcement of incoming requirements. (BEIS, 2021).
	There is a risk that Transition Plans **may not be comprehensive enough** to address issues such as adaptation, circularity and sustainability, or robust enough to reduce greenwashing, outsourced pollution, or Scope 3 reporting inconsistencies (WEF, 2022)
	There is a risk that Transition Plans **may not be sufficiently open and transparent** to enable an assessment to be made of whether corporate transition plans are collectively aligned with the UK's Sixth Carbon Budget trajectory for each sector (CTI, 2021)
Business & Economic	There are opportunities for companies to **outline how the climate transition will provide growth opportunities**, and to obtain additional investment if the plan is Net Zero aligned
	There is a risk that Transition Plans **may not encourage the development of new goods and services**, if their focus is on shorter term supply chain actions, rather than on the longer-term investments needed to transform the UK economy (Oliver Wyman, 2021).
	There is a risk that companies **may experience first mover disadvantage** or may not to publish a transition plan if its reveal commercially sensitive information about plans to reduce emissions by corporate restructuring rather than by investment (CSLN, 2021).
	There is a risk that Transition Plans **may not ensure a just transition** if new corporate reporting requirements focus on the metrics that encourage increased levels of corporate restructuring to reduce carbon intensity without reduction measures. (Eddie, 2021). There is also a risk that companies might miss out adaptation and biodiversity opportunities.
	There are legal and commercial risks associated with the publication of forward-looking plans, and companies may not publish transition plans if they don't have the required information and data, or if **the standard places too high a reporting burden on them**.
	There is a risk that **investors will respond to the publication of transition plans by divesting from companies** that haven't made sufficient progress in emissions reduction.

It should be noted that we added the risks and opportunities raised at the practitioners' workshop to the table, without citing a source, as it was agreed that practitioners' comments would not be attributable to individuals.

Our analysis suggests that **the key to realising these opportunities and minimising risks** is the adoption of a high-quality net zero transition plan standard that ensures that the information needed to make informed and sustainable investment decisions is presented in annual reports in clear, consistent and coherent manner. The net zero transition plan standard should also ensure that the information needed by other stakeholders to challenge companies to increase their corporate ambitions both in respect of reaching net zero sooner and in a manner that transforms their business model into a sustainable, resilient and circular one, is made available.

Ideally, the transition plan standard **should be also designed to provide the information needed** by market analysts, regulators and government to monitor corporate alignment with national and sectoral decarbonisation pathways so early enforcement action can be taken where companies fail to deliver on their commitments, omit key sustainability information from their transition plans in order to gain an unfair competitive advantage.

One way of achieving these objectives is **to design net zero transition plans so they can be used as finance raising tools by UK businesses to raise additional capital** needed to innovate business models, develop new goods and services and decarbonise their processes on the sustainability bond market. This approach has the advantage of addressing the **gaps in international standards around corporate net zero / climate transition investment planning and financing mechanisms,** whilst developing an open, transparent and robust investment plan that several authors have called for all listed companies to publish.

3. KEY ELEMENTS OF A TRANSITION PLAN STANDARD

The aim of this task was to address the second research question, "what could a high-quality transition plan standard look like for companies and financial institutions which operate in the UK?"

Our approach involved firstly reviewing transition plans from 12 sectors, mapping their key components and an analysing what information is currently included by non-financial and financial companies. Secondly, we prepared a list of key metrics needed to track reductions in emissions, progress against targets and the key influencing parameters needed to be monitored to understand how reductions have been achieved. We also assess the usefulness of a wide range of other potential metrics that could be included in transition plans.

The key observations that we made during the review process include:

- Only 61% of companies presented an analysis of how their markets are expected to change over the 25 to 30-year life of the plan, whilst **only 56% provided operational details of offsetting policies**.
- On average, the **corporate transition plans mentioned 64% of the 36 key components**, but only provided enough detail to enable an assessment of the quality of the information provided on 53%
- Most plans highlighted Science Based Targets and a target date for achieving net zero, but only a small number set out plans to reach the longer-term target in sufficient detail. It was difficult to tell whether the most popular **short-term measures had been greenwashed to demonstrate progress**.
- Most of the metrics proposed in previous work are sensitive to changes in level of activity or differences in Scope 3 boundaries, and **a meaningful intercompany comparison can be difficult to make**, where the proportion of the value chain directly controlled by companies being compared is different.
- Most of the transition plans we examined included news stories detailing the outcomes of previous projects but **provided very little detail on planned investments for the next reporting period**.
- The operational details of emission reduction plans were the least likely be highlighted in a separate section, whilst **most provided an analysis of their current emissions** and of risks & opportunities.

The main findings of these research activities include:

- T**here were examples of good practice in most plans we reviewed**, and that the availability of a high-quality net zero transition plan that draws on these examples is likely to encourage practitioners to adopt best practice in terms of the topics covered in plans and the level of detail presented.
- Some companies are raising additional finance on the Sustainable Bond Market to accelerate their transition to net zero. These companies must meet the LSE **requirement to prepare a transition framework that is aligned** to guidelines in the Climate Transition Finance Handbook (ICMA, 2020).
- Financial companies are starting to check whether the transition plans of the companies they hold investments in, meet the "Hallmarks" of a credible company transition (CBI,2021), and may divest their holdings if companies do not provide the information needed to reliably assess carbon exposure.
- The **portfolio management benchmarks being developed in the financial sector could be used in all sectors** to monitor the level of capital investment in emission reduction projects, the proportion of revenues that are from green activities and the degree of company balance sheet decarbonisation

The main conclusions of this research were that:

- The **lack of a defined structure for the presentation of net zero transition plans often results in inadequate disclosure** as key information competes for space with wider issues around the aftermath of Covid-19, reducing environmental footprint and addressing sustainable development goals.
- As the UK net zero aligned financial centre develops, **financial institutions and investors will expect all listed companies to have high quality transition plans** that enable them to meet the requirements of ISO 14097: 2021 to monitor emissions and take action to encourage companies to reduce emissions. The pressure for climate action will increase as sustainability metrics are deployed.
- **A high-quality transition plan should focus on presenting the information needed by investment market** to raise equity finance or debt finance on the sustainable bonds market in a credible, open, transparent and accountable way that other stakeholders can also access.

More details of the results of our analysis of this research question are presented in the following sections.

3.1 REVIEW OF A SELECTION OF GOOD-QUALITY TRANSITION PLANS

Our approach to this task was to use our experience of helping companies to develop transition plans with companies to identify a selection of good quality emission reduction plans from a cross-section of UK listed companies, that we could use to identify current best practice in the presentation of net zero transition plans:

Starting with lists of UK companies participating in the Science Based Targets Initiative (SBTi, 2022) and FTSE 100 companies with net zero commitments (WWF, 2021), we scanned the emission reduction plans published by 50 UK companies listed on FTSE 100 & All Share Index in 12 different sectors (see Annex 5).

We then identified a short list of 18 good-quality corporate emission reduction plans for a detailed review in consultation with CCC. The criteria for selection included selecting plans that

a) Had a reasonably compact emissions reduction plan with high level targets and interim milestones
b) Outlined a set of planned actions to reduce emissions
c) Covered a range of sectors, including financial services
d) Used a variety of different corporate reporting styles.

We then used an analytical framework (Figure 3) to focus the detailed review of the selected plans. This sets out a matrix of potential components observed in our initial review of a selection of 15 transition plans not selected for detailed review, laid out under six headings, whose initial letters spelt out the word: **Actions.**

The expected information content of each component is outlined out in Annex 7, whilst the colour coding indicates the extent to which that topic is clearly defined in the underlying standards referenced. In the red coloured areas, we found some definitions in draft international standards, but generally no agreement on how to report on these topics. In the yellow colour areas, work seemed to be underway to standardise the approaches undertaken, whilst in the blue coloured, we found that different approaches are being taken by different sectors or in different standards, which indicates that these may be areas for potential innovation and sharing of best practice.

Figure 3 The Analytical Framework used to review company emission reduction plans

Analysis	Commitments	Targets	Investment	Operation	News Stories
Contextual Analysis	Measurement & control framework	Longer Term Trajectory & Target	Investment plans	Performance Review Process	New Structures
Ambitions & Aspirations	Culture Shift & Behavioural Change	Tactical Approach (Action Plan)	Risk Management	Key Performance Indicators (KPI)	New strategies
Corporate Responsibilities	Code of conduct (Governance)	Technology Pathways / Roadmap	Executive Incentives	Carbon Offsetting & Insetting Principals	New Systems
Impact Analysis (Scopes 1-3 etc)	Stakeholder Engagement	Target Operating Model	Supply Chain Initiatives	Outsourcing & Offshoring Policies	New Skills
Risk & Opportunity Assessment	Circularity & Sustainability	Interim Targets & Milestones	Innovation Projects	Options Appraisal (Life cycle analysis)	New Staff
Quality Assurance (Systems & Standards)	Comprehensive Disclosures	Triangulation & Alignment	Information Technology	Outreach & Training	New Style

On average, the 18 plans reviewed mentioned 23 out of the 36 topics, but **only provided sufficient detail on 19 of the 36 topics** for our reviewers to assess the quality of the information provided. The operational details of the company's emission reduction plan were the least likely be highlighted in a separate section, whilst **almost all included an analysis of their emissions and a risk and opportunity assessment**.

One the main conclusions of our initial review was that most of the corporate transition plans we examined included news stories detailing the outcomes of previous projects, but **little detail on planned investments for the next reporting period**. Only 61% of companies presented an analysis of how their markets are

expected to change over the life of the plan, whilst **only 56% provided operational details of offsetting policies**. Only one company clearly set their policies on outsourcing and offshoring of emissions.

3.2 KEY COMPONENTS OF SELECTED TRANSITION PLANS

Our approach to identifying the key components of the 18 selected transition plans involved our analysts assessing whether the topics outlined in our analytical framework were mentioned or not, and then **assessing the level of detail presented.** This resulted in scores ranging between very low to very high. We then took an average score across the plans reviewed and rounded the average to the nearest integer (between 0 to 5).

The results of our analysis of the average level of detail included in current corporate emission reduction or transition plans on each of the key topics shown in Figure 4 below. The main finding of this assessment was that **the average level of detail presented in annual reports and sustainability reports was low to medium**, with some high scores, and an occasional very high. Two key topics were only discussed in one plan (each) and therefore their average score worked out as zero in the final analysis, after rounding.

Level of Detail
Very High
High
Medium
Low
Very low
None

Figure 4 The average level of detail presented in the 18 transition plans for each topic

Analysis	Commitments	Targets	Investment	Operation	News Stories
Contextual Analysis	Measurement & control framework	Longer Term Trajectory & Target	Investment plans	Performance Review Process	New Structures
Ambitions & Aspirations	Culture Shift & Behavioural Change	Tactical Approach (Action Plan)	Risk Management	Key Performance Indicators (KPI)	New strategies
Corporate Responsibilities	Code of conduct (Governance)	Technology Pathways / Roadmap	Executive Incentives	Carbon Offsetting & Insetting Principles	New Systems
Impact Analysis (Scopes 1-3 etc)	Stakeholder Engagement	Target Operating Model	Supply Chain Initiatives	Outsourcing & Offshoring Policies	New Skills
Risk & Opportunity Assessment	Circularity & Sustainability	Interim Targets & Milestones	Innovation Projects	Options Appraisal (Life cycle analysis)	New Staff
Quality Assurance (Systems & Standards)	Comprehensive Disclosures	Triangulation & Alignment	Information Technology	Outreach & Training	New Style

Most plans highlighted Science Based Targets and a target date for achieving net zero, but only a small number set out plans to reach the longer-term target in sufficient detail to achieve a high score. Similarly, the most popular method of reducing carbon emissions in the short term involves the purchase of renewable electricity. This measure is often stated without specifying whether the company was investing in the development of additional renewable electricity generation. In addition, some companies **appeared to be simply buying REGOs (or equivalents) in order to be able to demonstrate progress towards net zero** without buying the associated renewable electricity, which is considered a form of 'greenwashing' (Good Energy, 2020).

We also observed that **the risks identified by the TCFD process often did not result in action** in non-financial companies, who mostly either added them to their risk register or accepted them as unavoidable.

We also concluded that the lack of detail presented on some topics **may be due to the lack of a clearly defined structure for the presentation of a net zero plan** in annual company reports and sustainability reports. In part, this is due to a commendable desire to reduce the amount of detail presented so as not to overly burden shareholders, and partly due to the competing requirements of addressing wider issues around resilience of businesses in the aftermath of Covid-19, reducing the environmental footprint of supply chains, addressing sustainable development goals and repositioning the business model towards a circular economy,

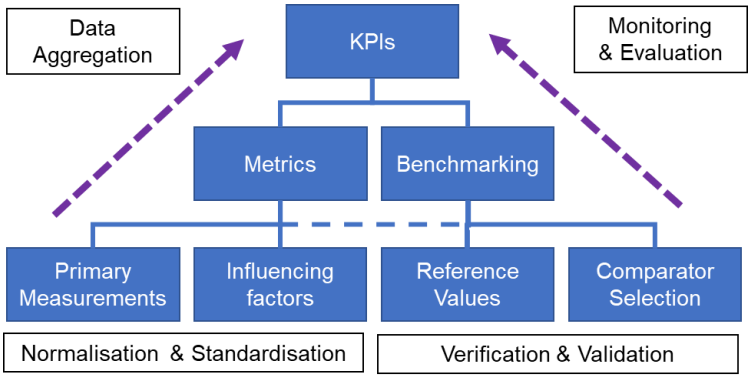
However, whilst it is easy to be critical of the lack of detail in the current generation of net zero transition plans, we concluded that **there are examples of good practice in most of the plans that we reviewed**, and that the availability of a high quality net zero transition plan that draws on these examples is likely to encourage practitioners to adopt best practice in terms of the topics covered in plans and the level of detail presented.

3.3 KEY METRICS THAT COULD BE REQUIRED IN TRANSITION PLANS

Our approach to considering what metrics could be **required in transition plans, to allow for standardisation, aggregation and comparability across transition plans**, involved reviewing a range of metrics that previous work on transition plan standards suggested could be used to track absolute reductions in emissions, assess progress against corporate emissions reduction targets and key influencing parameters.

To shape our thinking on this topic, we found it helpful to **consider how energy related metrics are standardised and used for monitoring and evaluation in business** (Figure 5), as energy related emissions represent more than 70% of UK emissions. Typically, this involves a normalisation process in which the primary measurements are adjusted to take account of any significant influencing factors, (e.g. differences in annual production, service activity, or heating degree days) before being benchmarked against performance in previous years, other parts of the company, and/or other companies.

Figure 5 How metrics are standardised and used



This benchmarking process involves selecting suitable performance comparator(s) from available reference values, and is most accurate when done at the lowest level of aggregation possible (e.g. individual building or unit process level). This is because when the raw measurement data is aggregated to company level to form higher level metrics or key performance indicators (KPIs), it is more difficult to correct for the influencing factors and to find suitable performance comparators, as the differences in property portfolios, business processes, plant and machinery, transport logistics, activity levels and climatic variations become more significant. Hence the most useful KPIs for intercompany comparison are ratios of metrics that are relatively insensitive to influencing factors and that have been adjusted to separate out discontinuities due to changes in company structure and presented alongside an analysis of the impact of the factors that have influenced performance.

Most of the metrics proposed in previous work are **sensitive to changes in level of activity or differences in Scope 3 boundaries**. These sensitivities reduced by selectively comparing companies in the same sector, or using sector specific metrics, but **a meaningful intercompany comparison can be difficult to make**, where the proportion of the value chain directly controlled by companies is different, or if the secondary measurements needed to enable comparison (e.g. tonnes of output or floor area) are not readily accessible.

Table 4 below presents an analysis of some metrics, which can be calculated from the data already collected by companies for Streamlined Energy and Carbon Reporting (SECR), Climate Change Agreements (CCAs) and UK ETS membership and that **could be standardised, aggregated and used to compare plans**.

Table 4 Hierarchy of key metrics that can be used to track emissions reductions and compare plans

Possible Metric	Scopes	Ease of Standardisation	Ease of data Aggregation	Usefulness for inter-company comparison of transition plans
Absolute GHG emissions in $MtCO_{2e}$/year	1 & 2	High	High	Need to convert to a sector specific ratio e.g. $MtCO_{2e}$/ tonne, m^2, etc.
	3	Low	Low	
Emissions per MWh of electricity/heat produced	1 only	High	Medium	Useful measure of carbon intensity but need MWh energy produced
Emissions per MWh of electricity and fuel used	1 & 2	High	Medium	Useful measure of carbon intensity but need MWh of energy used.
Emissions covered by ETS in $MtCO_{2e}$ / year	1	High	High	Of limited use – transactions often related to changes in activity level.
% Change in emissions relative to base year	1	Medium	Medium	Useful if have base year data & can factor out changes in activity level
Carbon intensity in £ turnover per $MtCO_{2e}$	1, 2 & 3	Low	Medium	Only useful for companies with/in similar business models/sectors

Ideally these metrics should **be supported by accounting breakdowns** of energy production by source type, energy use and GHG emissions by the scope of emissions and category of emissions source and type of GHG gas, and associated materials flow. Emission reductions should be accounted for in asset movement format covering acquisitions and divestments, closures, real reductions (e.g., efficiency improvements, material or fuel substitution), change in production level, changes in estimation methodology etc. (WRI & WBCSD, 2004)

3.4 OTHER METRICS THAT COULD BE INCLUDED IN TRANSITION PLANS

In addition to these metrics, we also reviewed the usefulness for intercompany comparison, degree of variability (due to sensitivity to assumptions, estimates or influencing factors) and their degree of sector specificity of **a wider range of metrics suggested by other authors**. Our findings are set out in Table 5.

Table 5 Assessment of the usefulness of other metrics discussed in the background literature

Possible Metric	Scopes	Variability	Specificity	Usefulness for inter-company comparison
Net Zero Company Benchmark (CA100+,2021)	Not Linked	Medium	High	Capital alignment metrics are useful but calculated using mixed methods.
Time-bound, verified science-based targets (CDP,2021 and others)	1 & 2	Medium	Low	Need to standardise base year, reference pathway & categories of Scope 3 emission included in target
	3	High	Low	
Carbon Impact Analytics Indicators (CIA, 2021)	1, 2 & 3	Medium	High	Carbon impact ratio, intensity evolution & green/brown share metrics are useful
Climate Action Tracker Benchmarks (CAT, 2020)	Not Linked	Medium	Medium	Uses set of high-level Paris compliant regional & sector indicators & metrics
Abatement Capacity Assessment (CPP, 2022)	1, 2 & 3	Medium	Low	Divides emissions into proven capacity probable capacity, uneconomic to abate
The Good Transition Plan Ratios (CSLN, 2021)	3	Medium	High	Useful approach to on- and off-balance sheet emissions for financial sector.
Sustainable product classification and labelling system (FCA, 2021a)	All	Low	Low	Potentially could be used to label assets on corporate balance sheet as well as current investment.
Making Mission Possible (ETC, 2020)	Not Linked	Medium	High	Circular economy metrics based on Energy Productivity could be useful.
GRI Universal & Sector Standards (GRI, 2022)	All	Medium	High	Assesses and reports contributions to sustainable development goals (SDGs)
Environmental Reporting Guidelines (HMG, 2019)	1, 2 & 3 (Partial)	Low	High	Useful list of intensity benchmarks by sector but need to be updated annually.
IEMA GHG Management Hierarchy (IEMA, 2020)	1, 2 & 3	Medium	High	A useful qualitative method of collating data on actions that companies take.
Corporate Climate Responsibility Monitor 2022 (NCI, 2022)	1, 2 & 3	Medium	Low	Useful high-level assessment of level of reporting transparency and alignment with 1.5oC pathway.
SASB disclosure requirements (SASB, 2020)	1, 2 & 3 (Partial)	Medium	High	Industry specific disclosure requirements for Scope 1, 2 & 3.
SBTi Targets (SBTi, 2020 & 2022b)	1, 2 & 3	Medium	Medium	Defines a range of target setting benchmarks for 50+ sub-sectors.
TCFD Metrics (TCFD 2021a & 2021b)	1, 2 & 3	Medium	Medium	Useful to understand level of exposure to transition risk, and value at risk.
TPI Sectoral Decarbonisation Pathways (TPI, 2022)	1, 2 & 3 (Partial)	Medium	High	Defines sector specific carbon intensity ratios for 10 energy intensive sectors.

Most other metrics were either sector specific or not specifically designed for corporate reporting, although many of them could be used to provide additional insight into company plans. The metrics that are specifically designed for use in company reporting **are propriety and require a membership subscription.**

3.5 BENCHMARKS FOR ASSESSING LEVELS OF CORPORATE AMBITION

Our approach to considering what target setting benchmarks could be referenced in transition plans to help companies to compare their level of ambition and performance against other companies, involved **reviewing a selection of the benchmarks used in current corporate transition plans**, **exploring how comparator groups were selected**, and then considering which could be included in the transition plan standard.

There are two main sources of target setting benchmarks that UK companies use: the Science Based Target initiative (SBTi) which covers 50 subsectors, and the Transition Pathway (TPI) which covers 10 energy intensive sectors. Experts have identified some methodological issues with these benchmarks (TEG, 2019, ISEAL, 2020, OU, 2021), but a programme of continuous improvement is underway to address these. (We will explore the advantages of checking transition plan alignment with these benchmarks in Section 4.3).

Sector benchmarks based on direct emissions (Scope 1 & 2) were considered the most accurate, but many other benchmarks have been proposed, but are not used by companies as they are too complex to implement. However, carbon intensity metrics are easy to calculate and will be discussed further Section 6.3.

The main reason why sector specific benchmarks are needed is due to in the differences in the barriers to decarbonisation between sectors. Table 6 sets out our analysis of the relative importance of different barriers in 12 sectors along with main constraints to increased ambition (SHELL, 2021, UWEB,2021).

Table 6 An Analysis of the Key Barriers and Main Constraints to increasing Corporate Ambition.

Sectors	Investment & Revenue	Innovation & Behaviour	Supply Chain & Technological	Organisational & Structural	Main constraints on increased ambition
Agriculture & Land Use	Medium	High	Medium	Low	Difficulties passing on extra costs to consumers
Aviation	High	Low	High	Low	Difficulties passing on extra cost to consumers
Construction	High	Medium	High	Medium	High capital cost and conservative supply chain
Energy	High	High	Low	High	Difficulties passing on extra costs to consumers
Finance	Low	Medium	Low	Low	Focus on shorter term returns limits investment
Hospitality	Medium	High	Medium	Medium	Consumer behaviour and complex supply chains
Manufacturing	High	High	High	Medium	Varies by sub-sector, but capital is often rationed.
Retail	Medium	High	High	Medium	Consumer behaviour and complex supply chains
Services	Low	Medium	Low	Low	Varies by sub-sector, but capital is often rationed.
Transport	High	High	High	Medium	High capital cost and conservative supply chain
Waste & Recycling	Medium	High	High	Medium	Difficulties passing on extra costs to consumers
Water	Medium	High	Medium	Low	Difficulties passing on extra costs to consumers

In most cases, **levels of ambition are limited by high capital costs, difficulties passing extra costs to customers and capital rationing**, which restricts the number of decarbonisation projects that companies can undertake each year. Generally, the technologies needed to decarbonise most business operations and supply chains are available (with some exceptions), but decarbonisation projects offer less attractive returns or are more risky than other projects. Further investment may also be needed to scale up for commercial deployment.

The main alternative to these target setting benchmarks are the **portfolio management benchmarks being developed for the financial sector** (IIGC 2021c &2021d). These involve the measurement of strategic asset allocation and asset class alignment and could be used in all sectors to monitor the level of capital investment in emission reduction projects and rate of progress in terms of the proportion of revenues that are from green activities, and the degree of company balance sheet decarbonisation. In addition, an abatement capacity assessment could be used to map out the current and future cost effectiveness of different types of investment.

4. MECHANISMS FOR ENSURING ALIGNMENT AND AMBITION

The aim of this task was to address the second research question, "What are the main mechanisms that could ensure transition plans have appropriate ambition?"

Our approach involved firstly considering how corporate transition plans might be checked for alignment with the UK's Sixth Carbon Budget and Net Zero Strategy pathways. Secondly, we considered the potential strengths, complications and limitations of checking for alignment with the international pathways and key standards and frameworks for target setting, before exploring how the Net Zero Transition Plan standard might require or indicate a certain minimum emissions reductions ambition for UK companies. Finally, we considered what other mechanisms or approaches could be used to ensure corporate plan alignment.

The key observations that we made during this review process include:

- **Most companies set emission reduction targets in terms of Scope 1 & 2 emissions**, and some have Scope 3 reduction targets. International, national & sector pathways are defined in terms of Territorial (i.e. Scope 1) emissions, so this is the best basis for any pathway comparison.
- It is difficult to make like for like comparisons between companies on a combined scope 1,2 & 3 basis, as **the categories of Scope 3 emissions covered by targets is not yet standardised**.
- A comparison of emission reductions plans with international pathways is only useful, if there is an **agreed set of international metrics and pathways for that particular type of company.**
- Using the IEA pathways to set both short and longer-term targets, **resulted in considerably lower levels of ambition** than required to meet the UK's 6th Carbon Budget target and Net Zero pathway.
- **Using the IPCC 1.5oC Global Pathway is also results in lower levels of ambition** in some sectors unless UK sector pathways are factored in - as has been done for local authorities.

The main findings of these research activities include:

- The **best starting point for a comparison with international pathways is the IPCC 1.5oC total carbon budget**, since this allows alignment with the UK's Carbon Budgets and Sector Pathways.
- The benchmarking approaches used by existing standards and frameworks for target setting are **grounded in robust methods of carbon accounting** and they could be a useful tool for reducing the emissions provided they can be persuaded to factor national pathways into their products.
- Due to the way **national models aggregate up emissions data**, it would be difficult for companies to derive benchmarks from them. However, with some additional processing, it should be possible to create benchmarks that could be used check the alignment of corporate net zero transition plans.
- **Having a single pathway for every company in a supply chain is not realistic**, given that there were bound to be early and late adopters, as well as market leaders and market followers.
- The main challenge is to **set a range of targets for companies depending on their level of ambition** rather than a single target based on the assumption all will transition at the same time.

The main conclusions of this research were that:

- **A combination of indicators may be needed to send a clear alignment signal** to companies, and these could include a minimum emissions reduction and minimum carbon price requirements, and indicators of public procurement eligibility, carbon intensity and compliance with carbon budgets.
- A new **environmental label that indicates the level of emissions reduction ambition** that a company has relative to its sector benchmark, should be included in a transition plan standard.
- A range **of tools could be developed to help companies set emissions reduction targets** that aligned with the UK Net Zero with sector pathways, including a carbon budgeting tool, cutting edge benchmarks, new carbon budgeting standards, and new trading arrangements for carbon budgets.

We recommend that all of the options for new tools we explored should be taken forward after the project.

More details of the results of our analysis of this research question are presented in the following sections.

4.1 ALIGNMENT WITH THE 6TH CARBON BUDGET & NET ZERO STRATEGY

Our approach to considering how corporate transition plans might be checked for alignment with the UK's Sixth Carbon Budget and Net Zero Strategy involved firstly exploring the options for comparing a company's **target percentage reduction** in Scope 1 and 2 emissions with the balanced pathway outlined in CCC's 6th carbon budget report and pathway outlined in the UK's Net Zero Strategy. Secondly, we considered whether the **metrics in the CCC's report** on the Role of Business in Delivering Net Zero or alternative metrics such as carbon emissions per tonne, per £ turnover or per m2 floor space etc. could be used to check alignment.

Table 7 summarises our assessment of the potential strengths, complications and limitations of each option, including the issues around multinational companies and companies that rely on international supply chains.

Table 7 Strengths, complications and limitations of options for checking alignment with UK pathways

Option	Strengths		Complications		Limitations	
Comparison with **UK's Sixth Carbon Budget** national and sector pathways (CCC, 2020d)	The supporting analysis workbook provides a clear analysis of the specific technologies that will need to be deployed to reach net zero by 2036 & 2050. The projections are based on analysis of UK GHG inventory data.	H	The modelling approach blends emissions from different source categories to help reduce the dimensionally of the modelling. There is an intrinsic optimum bias in the method used to select which abatement technologies are deployed, when and how fast.	M	The way that the sources of emission are aggregated in the manufacturing sector means that this approach might not set a sufficiently ambitious target for non-energy intensive companies. Potentially this issue could be fixed by post processing	M
Comparison with **UK's Net Zero Strategy** (HMG, 2021a)	The supporting workbooks provide a clear analysis of the government policies that are expected to reduce emissions in each sector up to 2040, but not 2050. Based on an analysis of UK GHG inventory data.	H	The modelling approach blends emissions from different source categories to help reduce the dimensionally of the modelling process. There is intrinsic pessimism bias in this method, which may be adjusting for policy overlap.	M	The way that the sources of emission are aggregated in the manufacturing sector means that this approach might not set a sufficiently ambitious target for non-energy intensive companies.	H
Metrics set out in the CCC's report on the Role of Business in Delivering Net Zero (CCC, 2020b)	This sets out a number of actions that UK business could adopt, and the potential impact on sector emissions at a high level for c. 2035 only.	L	The outcome of each action is not translated into metrics and benchmarks that could be used to gauge alignment with sector pathways but could be with additional modelling work.	H	These metrics are based on the same sector breakdown as the sixth carbon budget model and hence might not result in a sufficiently ambitious target for non-energy intensive companies.	M
Alternative metrics e.g. tCO2/£ turnover, tCO2/tonne output tCO2/m2 floor space	There is a long tradition of using metrics such as kWh/m2 and kgCO2/m2 to benchmark building energy performance. Other metrics such as. emissions per tonne of production or £ turnover have also been used.	M	The benchmarks for buildings were originally derived from survey data and highlight the good and best practice in design of specific categories of building. It would be a challenge to produce new benchmarks for each type of building / application class.	H	The metrics used to benchmark a building are specific to the type of building, and usage class. They could be reworked to increase the best practice benchmarks, but there may be issues around alignment with current practice	L

We observed that **most companies set emission reduction targets in terms of Scope 1 & 2 emissions combined**, and some have targets for reductions in Scope 3 emissions. It is difficult to make like for like comparisons between companies on a combined scope 1,2 & 3 basis, as **the categories of Scope 3 emissions covered by targets is noy yet standardised**. International, national & sector pathways are defined in terms of Territorial (i.e. Scope 1) emissions, so this is the best basis for pathway comparison.

We also concluded that due to the way the **existing models aggregate up emissions data**, it would be difficult for companies to derive benchmarks from the datasets that we reviewed. However, with some additional post processing of the underlying datasets it should be possible to create benchmarks that could be used check alignment of corporate net zero transition plans with UK national or sector pathways.

4.2 CHECKING ALIGNMENT WITH INTERNATIONAL NET ZERO PATHWAYS

Our approach to considering the potential options for checking transition plans with the international net zero pathways published by the IEA and IPCC by looking at the options to compare the percentage of Scope 1 &2 emissions reduction projected by the company and percentage emissions reduction projected for the sector in their 1.5oC or B2DS scenario and associated benchmarks used to forecast pathways for sector emissions.

Table 8 summarises our assessment of the potential strengths, complications and limitations of each option, including the costs for UK based organisations of using associated target setting and verification services.

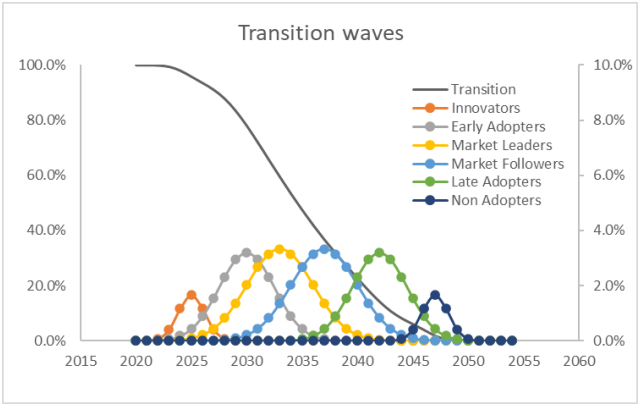
Table 8 Strengths, complications and limitations checking alignment with international pathways

Option	Strengths		Complications		Limitations	
IEA Net Zero Pathways (IEA, 2021 a & b)	The IEA uses a large-scale simulation model (WEM) to provide robust medium- to long-term projections of global energy supply & demand with breakdowns at sector and regional level. Its global scenarios are updated on a rolling basis by a team of experts, and they evolve to take account of changes in energy use, policies and technology developments.	H	The IEA strictly controls the distribution and use of its model data and a licence fee must be paid for each application of its data. Sector and regional pathways datasets are updated less frequently that global pathways and in a fast-moving field many of the previous sector and regional pathways do not reflect the IEA's 2021 net zero scenario	H	The UK is modelled as part of the European Region, including Turkey. The global and European pathways do not reflect the UK's ambitions and are not a very good starting point for comparison. The main exception is that the global projections can be used as a "backstop" metric to ensure UK companies at least comply with global pathways.	H
IPCC Pathways (IPCC 2018 a & b)	The IPCC uses global and regional climate models to simulate the impact of GHG emissions on global and regional temperatures. These models derive a total carbon budget that is consistent with limiting global temperature rises to 1.5ºC.	M	The IPCC pathway spreads the total carbon budget over the remaining years to 2050, using inventory-based projections of future global emissions. The IPCC leaves to others to issue regional or sector pathways.	M	The division of the total carbon budget between organisations is topic of on-going debate. There are many methods of allocation, including national pledges, emissions intensity, historical emissions, social utility etc. (B&C, 2020)	H

Our first observation on the options we examined is that is a comparison of emission reductions plans with international pathways is only useful, if there is an **agreed set of metrics and pathways for that particular type of company** and the basis for the comparison is clearly defined and considered "fair and reasonable".

We also considered whether **having a single pathway for every company in a supply chain was realistic**, given that the models indicate there will be early and late adopters, as well as market leaders and market followers, particularly where supply chains are spread over many sectors and countries with different decarbonisation rates. In this case, the transition might proceed more in smaller transition waves (Figure 6) as new technologies are proven and accepted and the market gradually adopts new products. The challenge is then to **set a range of targets for companies depending on their level of ambition** and ensures an orderly transition rather than a single target based on the assumption all companies will transition at the same rate.

Figure 6 Transition Waves (Concept Diagram)



On balance, given the challenges involved in using IEA data, we concluded that the **best starting point for a comparison with international pathways is the IPCC 1.5oC total carbon budget**, since it represents the least cost option, and allows the comparison to be aligned with the UK's Carbon Budgets and Sector Pathways.

4.3 ADVANTAGES OF CHECKING ALIGNMENT WITH EXISTING STANDARDS

Our approach to considering the advantages of checking transition plans for alignment with key existing standards and frameworks for target setting, involved firstly examining the methodology used set targets by a range of commonly used frameworks, their sectoral coverage and which scopes were included in targets. Secondly, we **cross-checked the percentage reduction** (relative to a 2019 base year) recommended for 2036 and 2050 with the value in the balanced pathway in CCC's 6th carbon budget report for 2036 & 2050.

Table 9 summarises our assessment of the potential strengths, complications and limitations of each option, including the costs for UK based organisations of using associated target setting and verification services.

Table 9 Strengths, complications and limitations of checking alignment with existing standards

Option	Strengths		Complications		Limitations	
Science Based Targets Initiative (SBTi) (SBTi, 2022)	Uses both Absolute Contraction and Sector Decomposition methods to set targets for organisations in 50 sub- sectors. Its targets are based on the IEA's B2DS & NZ pathways or its own IPCC 1.5oC pathway	H	Requires Scope 3 targets, if it represents more than 40% of their carbon footprint. Setting targets under the two different approaches resulted in different targets for short term reductions.	M	Based on the IEA & IPCC pathways which make assumptions on growth in global GDP, which may not be relevant to the UK. Estimated costs per 2 targets. $14,500 for large companies & $2,000 for SMEs (<500 employees	M
Net Zero Pathway for Oil & Gas (IIGCC, 2021a)	This publication outlines a net zero by 2050 pathway for Oil & Gas sector companies.	L	Requires short medium & long-term targets that are align with the IPCC 1.5ºC pathway.	L	It is primarily a recipe for an orderly wind down of the sector, so not relevant to other sectors. Free to use.	H
Transition Pathway Initiative (TPI,2022)	TPI uses a sector decomposition approach to provide benchmarks for 10 energy intensive sectors. The benchmarks are based on the IEA's Pathways (B2DS, 1.5oC/ NZ & National Pledges). Designed for investor use.	M	Each sector uses a different intensity metric, and the pathways may use IEA pathways from various years. Some metrics include Scope 1, some Scope 1 & 2 and others Scope 1 & 2 & categories of Scope 3.	H	Uses IEA pathways which make assumptions on growth in global GDP, which may not be relevant to the UK. A prototype benchmark for other industrial sectors has been published (TPI, 2021). The tool is currently free to use.	M
Carbon Neutral Certification via PAS 2060: 2014 (BSI) and The Carbon Neutral Protocol (CNP,2022)	There are several carbon neutral standards. Both PAS 2060 and the Carbon Neutral Protocol (CNP) used by UK companies. Both require emissions reduction plans and emissions must be offset annually through verified instruments.	L	The CNP standard has recently been updated to require organisations with emissions >100 ktCO2e/*year* to set abatement targets as of 2022. Certification costs start at just $1k, but the costs of independent verification can be high.	M	The CNP does not require smaller participants to set emissions reduction targets, but participants are asked make use of established management tools to identify the optimal balance between internal reductions and use of offsets to achieve carbon neutrality.	M

One of our key findings was that standards and frameworks that use the IEA pathways to set both short term and longer-term targets for emissions reduction, **resulted in considerably lower levels of ambition** than is required to meet the UK's 6th Carbon Budget targets and UK Net Zero pathway for 2050. **Using the IPCC 1.5oC Global Pathway is likely to result in lower levels of ambition in some sectors, unless UK Carbon Budgets and UK Sector pathways are factored in** - as SCATTER tool does for local authorities (AG,2019).

The benchmarking approaches and metrics used by these organisations are **grounded in robust methods of carbon accounting** and they could be a useful tool for reducing the emissions of large UK based multi-national companies and their supply chains, provided they can be persuaded to factor national pathways into their products. They also need to extend and standardise the categories of Scope 3 emissions covered. Whilst the emissions reduction potential of Carbon Neutral Certification Schemes is more difficult to quantify, their approach to **certifying brands, activities and verified offsets could also be useful** in tackling induced emissions, although they also need to extend and standardise the categories of Scope 3 emissions covered.

4.4 ALTERNATIVE WAYS OF SETTING EMISSION REDUCTION TARGETS

Our approach to identifying alternative ways of setting emission reduction targets for UK companies involved considering a range of alternative methods that could be used to set emission reduction targets, including direct and indirect methods, and then assessing which could be used to **set emission reduction targets that reflect key company characteristics**, such as size, sector and main source of emissions (e.g. Scope 1).

Table 10 summarises our assessment of the potential strengths, complications and limitations of six different options, including the costs for UK organisations of using associated target setting and verification services.

Table 10 Options for requiring, signalling or indicating minimum emissions reduction ambitions

Option	Strengths		Complications		Limitations	
Minimum Emissions Reduction (MER) requirements	Environmental regulations already set maximum emissions for industrial processes based on best available technology not entailing excessive cost.	M	It can be complex task to define the best available technology for an entire supply chain, as each supply chain is unique, and interacts with others	H	This approach is only effective if companies cannot avoid MERs by moving carbon intensive aspects of their value chain to other countries with lower MERs.	M
Minimum Carbon Price (MCP) requirement	This would require companies to factor a minimum carbon price into their investment decisions, which would rise over time	H	To be effective this approach depends on companies using lifecycle costing instead of the simple payback criteria.	M	It is hard to see how a minimum carbon price could be implemented through the transition plan standard, but it could be via the UKETS.	H
Sector / Pathway Benchmark (SPB) Indicators	This approach allows minimum emission reductions to be signalled to sectors via carbon intensity benchmarks that can reflect company size & sector	H	The most effective benchmarks are those that are derived from analysis of bottom-up technical performance data. This data is difficult to obtain.	M	Experience suggests that the use of sector benchmarks to drive emissions reduction is a flow acting process, with improvements principally realised at end of asset life	M
Carbon Intensity Labels (CIL) Indicators	Environmental labelling can be used to provide signals that influence customer choice and to introduce minimum standards of performance into the market-over time at "point of sale".	M	A wide variety of Environmental Labelling and Information Systems (ELIS) are already used by companies and a new company label will take time to be accepted	M	The best labels visually highlight the key benefits of a product to consumers at the point of a sale and are not effective if too many factors are displayed, the label is hidden out of sight, or not "refreshed" often enough.	M
Public Procurement Eligibility (PPE) indicators	The public sector uses eligibility screening and performance clauses in contracts, and these could be turned into an indicator that emissions reduction plans are acceptable.	H	Manufacturers are unlikely to accept performance clauses, but might undertake eligibility screening if this results in the provision of "status label" with street credibility	M	Performance clauses are only applied to large service contracts, as it is expensive to monitor the performance of small contracts. PPE screening is often viewed as a tick box exercise.	M
Carbon Budget Allocation (CBA) Indicators	This method allows minimum emission reductions to be signalled to companies by publishing a carbon budget allocation (calculation) method.	H	It is difficult to identify a single allocation method that could be applied to all sectors of the economy, so pre-publication in a standard seems challenging	H	It is difficult to factor in future changes in activity level and structure of the economy into CBA indicator, and the formula would need updating regularly.	M

Our analysis of these different methods of setting minimum emissions reduction targets suggests that **a combination of indicators may be needed to send a clear alignment signal to individual companies**. Of the options examined, the possible introduction of a **new environmental label that indicates the level of emissions reduction ambition** that a company has relative to its sector benchmark, seems the easiest option to include within a transition plan standard. This label could also signal information on compliance with a code of conduct on offsets for example, the use of internal carbon pricing to fund supply chain decarbonisations projects and the company's commitment to reach net zero across its supply chain by a specified target date.

4.5 OTHER METHODS OF INCREASING ALIGNMENT AND AMBITION

Our approach to considering what other approaches could be used to ensure alignment with UK pathways and to increase emissions reduction ambitions, involved **identifying a selection of tools, indicators and standards** that could be used to help UK companies to align their transition plans with national targets and to increase levels of ambition. These options would enable the level of emissions or reduction targets to be compared at product, activity, site, company and supply chain levels, and thus enable **the benchmarking methods used by financial analysts to drive up the levels of ambition** reported in company transition plans. The information they generate could also be collected alongside the data gathered by other UK schemes (SECR, ESOS, CCA and UKETS), provided that a right of access to benchmarking data can be established.

Table 11 summarises our assessment of the potential strengths, complications and limitations of each option.

Table 11 Strengths, complications & limitations of other potential alignment mechanisms

Tool	Strengths		Complications		Limitations	
Carbon budget allocation tool (CBAT)	An CBAT could be designed to generate initial carbon budgets indicators based on what energy, emissions and carbon footprint data.	H	To generate Scope 3 targets, the tool would need to include the sector pathways from other national NCEPs.	M	An CBAT would be only as good as the quality of the data input, so some form of limited assurance process would be needed to prevent unrealistic targets being set.	M
Climate Outcome Indicators (COI)	A set of COIs could be used to increase the visibility of the climate co-benefits of emission reduction projects in annual reports.	H	These indicators would need to be designed to sit alongside the Sustainable Development Goal (SDGs) indicators in reports.	H	Climate assessments are focussed on risks. A balanced scorecard approach is needed to motivate breakthroughs.	L
Cutting Edge Benchmarking Norms	Probability distribution (PD) curve method of developing benchmarks could help to increase ambition.	M	The classification system for engineering estimates uses 3-point estimates – difficult to change this.	M	The PD metrics used by stock market analysts to characterise investment returns is bespoke.	L
Carbon Intensity Tagging System (CITS)	CITS would enable information on carbon intensity of investments & project to be machine readable (FCA,2022).	M	A tagging system is being developed by the IFRS to make annual reports machine readable. The system is just starting.	L	The UK tagging system is used to extract financial data from company reports Taxonomy extensions are not currently encouraged.	H
Climate Investment Classification System	A standard classification system for investments in emission reduction projects supports investor decisions.	H	GTAG is working on a UK Green Taxonomy to help label investments. This will replace the EU Taxonomy.	L	The EU taxonomy doesn't adopt a holistic approach to business model innovation, and the circular economy.	M
Carbon budget standards (CBS)	A CBS would draw together the advice in accounting standards into a single holistic framework.	H	Current standards depend on users undertaking a detailed data gathering which is a major barrier.	H	New standards often take many years to develop and resulting documents are not accessible to lay people.	M
Carbon Investment Assurance List (iCIAL)	An CIAL would help to tackle greenwash, by verifying investment performance claims.	M	Listing schemes are governed by rules which might not keep up with evolving financial markets.	H	A voluntary listing scheme would take time to gain critical mass unless the UK Government adopts them.	M
International Certificate Exchange	London Stock Exchange could be used to trade allocations between nations in exchange for investment	M	Could be extended to enable all UK companies to trade certificates on London Stock Market	M	There would need to be a fair amount of up-front investment to get the exchange up and running	H

We did not reach a conclusion on the relevant merits of these different options, as the concepts impinge on the on-going work of several standardisation bodies and Taskforces, who would need to be consulted first, although enabling **the benchmarking methods used by financial analysts and other stakeholders to drive up the levels of emission reduction ambition** reported in company transition plans was an attractive option. However, we **recommend that the eight outline concepts should be explored further** after this project.

5. MONITORING, GOVERNANCE AND ENFORCEMENT

The aim of this task is to address the fourth research question, "what monitoring, governance and enforcement should accompany the transition plan requirement?"

Our approach involved firstly reviewing the proposed transition plan governance arrangements in the light of recent developments in regulatory framework and then identifying specific aspects of monitoring, governance and enforcement needed further consideration. Secondly, we considered a range of options to strengthen data verification, and mechanisms to raise business ambition and to track transition plan delivery. Finally, we considered the potential use of transition plans as a transparency tool for investors, citizens and consumers.

The key observations that we made during this review process include:

- Under current proposals for the reform of corporate auditing and reporting **listed companies will be required to publish annual Resilience Statement assessing the company's prospects and addressing challenges to its business model over the short, medium and long-term**, including risks posed by climate change. A new Audit, Reporting and Governance Authority is proposed.
- The **FCA expects investment product providers to determine the correct categorisation for their products and may challenge firms' claims** during the regulatory engagement and supervisory processes. The FCA has powers of enforcement under the UK Benchmark Regulations 2018.
- There are **at least four different data aggregation processes in the current system of corporate reporting of emissions**, and investment analysis, before carbon metrics are presented to investors.
- There are **a range of tools that could be used to help directors to assess their level of ambition** relative to their peers and national and sector targets that could be used to raise levels of ambition.
- **A combination of different visual indicators is increasingly used to nudge consumer behaviour towards more sustainable options**, rather than conveying information on performance.
- With careful design, v**isual indicators can act as a transparency tool for consumers, citizens and investors**, without necessarily placing a significant additional burden on companies or government.

The main findings of these research activities include:

- M**ost of the components required for the monitoring, governance and enforcement of the transition plan requirement, were already either in place, or under development**. The remaining issues that need to be considered were how best to verify the data published in transition plans, to raise business ambition, track delivery and to use transition plans as a transparency tool.
- The degree of difficulty and cost to government of different **monitoring and governance options depend on a range of service and product design considerations**, but a conventional propose and review option potentially involved the least amount of additional effort on the part of the company.
- A combination of methods is normally used to track progress against delivery of time critical actions and a review of planned verses actual delivery of plans plus random quality assurance audits would **provide considerable insight into the progress of individual companies and each sector overall**.
- In a business reporting context, **visual indicators can also act as a window into the environmental performance** of a company's operations, brands, products and services where data is not disclosed.

The main conclusions of this research were that:

- **Current data aggregation processes do not lend themselves to the task of monitoring of transition plan** implementation and need revision to enable the development of cutting-edge metrics.
- A **combination of voluntary certification and the inclusion of a requirement to comply with the new standard within international accounting standards and corporate reporting regulations** might be needed to encourage widespread adoption and levels of compliance with the new standard.
- The progress tracking process **should involve an element of independent assurance that goes beyond the application of normal commercial Quality Management and Assurance Systems**. Whilst a self-regulatory approach may seem more cost-effective in comparison to external verification, the latter is probably required to **resolve the growing problem of greenwashing of annual reports**.
- An **extra section could be added to the transition plan containing a schedule of authorised indicators**, which can be used in business planning and by investment firms for benchmarking.

5.1 TRANSITION PLAN GOVERNANCE ARRANGEMENTS

Under the UK Government's proposal, the requirement to disclose Transition Plans would be incorporated into the sustainability disclosure requirements (SDR) applicable to asset managers, regulated asset owners and listed companies, in a similar manner to the way other TCFD recommendations have been implemented. The transition plan requirement is being integrated into the **UK Government's plans for an economy-wide roll out of SDRs by 2025 as set out in "Greening Finance: Roadmap to Sustainable Investing"** (HMT, 2021).

Due to the different ways that asset managers, regulated asset owners and listed companies are governed under UK law, **several mechanisms are being used to implement TCFD-aligned SDR**, including:

- Statutory guidance (DWP/TPR)
- Supervisory expectation (BoE/PRA)
- Listing regulations (FCA)
- Statutory instruments for UK Companies & LLPs (BEIS)
- International standards (IFRS/ISSB)

As the **first step towards mandatory disclosure of transition plans, the Financial Conduct Authority (FCA) has updated its TCFD-aligned listing regulations** (FCA, 2021b) so they now reference the TCFD's updated Guidance on Metrics, Targets, and Transition Plans (TCFD, 2021a & 2021b) instead of the TCFD's 2017 recommendations. However, this guidance is not mandatory as only requires listed companies that are planning to publish transition plans to consider the TCFD's Guidance or explain why they have not done so.

The FCA has also **outlined plans to update the regulations to reference the new ISSB standard, IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information** when it finalised rather than the TCFD recommendations (FCA, 2021a). The first exposure draft of this new standard (IFRS, 2022) does not specifically reference transition plans, but an earlier prototype of the standard did (IFRS, 2021).

This **new ISSB standard is considered the first step towards developing a common global baseline of corporate reporting standards on climate change and wider sustainability matters**, integrated with financial reporting standards under the IFRS Foundation's robust governance structure. There is a legal requirement for all UK publicly listed companies to use UK-adopted IFRS standards (UKEB, 2022).

BEIS has published a white paper on a reform of corporate auditing and reporting (BEIS, 2021b) that would **require Directors of listed companies to publish annual Resilience Statement assessing the company's prospects and addressing challenges to its business model over the short, medium and long-term**, including risks posed by climate change, and a new Audit, Reporting and Governance Authority (ARGA).

The **FCA expects investment product providers to determine the correct categorisation for their products and may challenge firms' claims** during the regulatory engagement process, for example at the gateway when authorising new funds, and on an ongoing basis through supervisory dialogue. The FCA is also **exploring whether market-led mechanisms might support the establishment and verification of a robust system, and whether there could be a role for independent verifiers to underpin trust in the system**. The FCA has also in the process of establishing the Disclosures and Labels Advisory Group (DLAG) to provide independent advice to the FCA on the development and implementation of new sustainability-related financial disclosure requirements and a sustainable classification and labelling system for investment products. The FCA could also use its powers of enforcement under the UK Benchmark Regulations 2018 (FCA, 2022b).

In addition, BSI's Sustainable Finance Programme **aims to encourage the wider uptake of sustainable finance practices, behaviours, thinking, products and services**, while helping organizations from the financial sector align themselves with the global UN Sustainable Development Goals (SDGs), which includes the establishment and secretariat of a new international committee ISO/TC 322, Sustainable Finance. So far, BSI has published two publicly available specifications (PAS) on the principles of sustainable finance an investment management practices. A third PAS is under development and will cover requirements for the assessment, governance, labelling and communication of funds presented as having sustainable credentials.

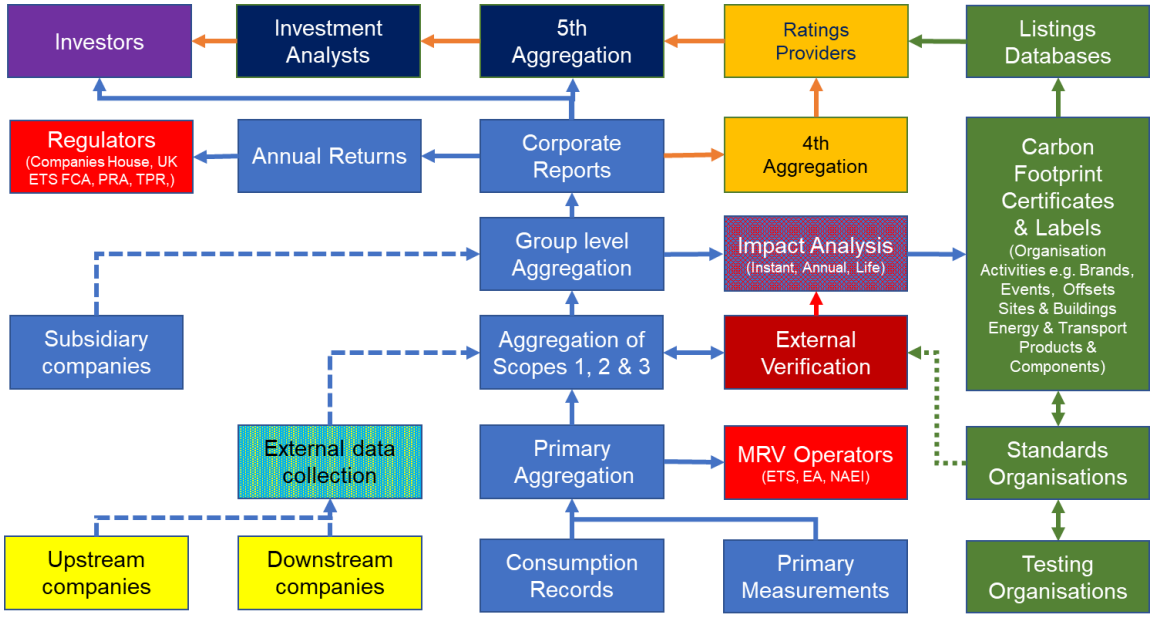
As a result of this review, we observed that **most of the components required for the monitoring, governance and enforcement of the transition plan requirement, were already either in place, or under development**. The remaining issues that need to be considered in light of the decision to extend the transition plan requirement to non-financial companies were how best to verify the data published in transition plans, to raise business ambition, track delivery and to use transition plans as a transparency tool. In the following sections, we will consider a number of options and assess their advantages, complications and limitations.

5.2 OPTIONS FOR VERIFYING THE DATA IN TRANSITION PLAN

Our approach to considering how the data published in transition plans might be verified involved firstly **considering what data on energy and emissions is published by companies in annual reports**, how this data is verified, and **how aggregation impacts on data quality and comparability**, Secondly, we considered if it was possible to extend existing Monitoring, Reporting and Verification (MRV) systems to improve data quality. Finally, we consider the potential use carbon footprint labelling to improve data quality.

To aid our thinking, we **mapped out the steps involved in producing carbon footprint data for annual reporting and** carbon footprint labels (see Figure 7). This illustrates that there are three data aggregation processes inside, and two more outside of the company before carbon footprint data reaches investors via the corporate reporting route. These data aggregation processes mean that potential uses of company level carbon data for tracking implementation of transition plans is limited unless breakdowns of emissions by location, scope and source are also made available. Whilst some companies publish these breakdowns, others do not for reasons of confidentiality. To address this issue, **the disclosure of the location, scope and source of carbon emissions could be mandatory element of a new transition plan standard.**

Figure 7 The steps involved in the production of carbon footprint for annual reports and labelling



Another source of carbon data is the site level data collected by the operators of the Monitoring, Reporting and Verification (MRV) systems associated with the UK ETS, NEAI and Environmental Permits. However, this only covers emissions from combustion plant and is of limited use in interpreting carbon footprints. These **MRV data capture processes could be extended to collect other carbon emissions data at site level** but **verifying data from the supply chain would be challenging,** particularly were setting up data sharing agreements with MRV operators in other countries is required to verify carbon footprint estimates.

The **forecast emissions data in net zero transition plans could be used for carbon footprint labelling**, and the resulting labels provided to rating providers or directly to investors. The number of data aggregation steps involved in carbon labelling is smaller, and the impact analysis step may include a disaggregation step in which annual emissions are often broken down by source, activity, and product before being submitted for external verification. Applications for carbon labelling could be voluntary, but **the transition plan standard could define the nature of the disaggregation process, and the ratings, metrics and methodology**.

It the **new transition plan standard is published as a Publicly Available Specification** (PAS) then the **existing accreditation processes for external verification and certification of carbon footprints could be used**. This approach has the advantage of being faster to implement than the approaches adopted in respect of the TCFD recommendations and would make it easier to update the transition plan standard to reflect changes in the sustainable bond market, and to roll out internationally to non-UK listed companies.

However, we concluded that **a combination of voluntary certification and the inclusion of a requirement to comply with the new standard within international accounting standards and corporate reporting regulations** might be needed to encourage widespread adoption and levels of compliance with the standard**.**

5.3 GOVERNANCE OPTIONS FOR ENSURING RAISED BUSINESS AMBITION

Our approach to considering the governance options for ensuring raised business ambition in transition plans, involved considering what tools could be used to help directors to assess their level of ambition relative to their peers and national and sector targets, and what review mechanisms could be used to encourage higher levels of ambition, including pressure from different stakeholder groups, including the company's directors, employees, clients, investors and regulators.

Table 12 summarises our assessment of a range of options identified, in terms of three criteria: degree of implementation difficulty, cost to the government, and potential effectiveness in raising ambition prior to publication. Each element has been assigned a High (H), Medium(M), or Low(L) RAG rating against each criterion.

Table 12 Assessment of governance options for ensuring raised business ambition

Option	Description	Difficulty of implementation		Cost to the government		Potential effectiveness	
Propose & Review function	This involves the submission of the company's transition plan to an independent reviewer who would verify that the requirements of the transition plan standard have been met, and provide advice, if not. The advisor would have only a short-term engagement with the company.	The degree of difficulty of implementation of this option is considered comparatively low as similar business advisory services have been operated before, and there are a range of options for service delivery, ranging from setup up a centralised help line to using one of the existing networks of professional advisors e.g. accountants.	L	This option will require investment in the recruitment and maintenance of a dedicated team of reviewers in-house or an out-sourced service provider. Alternatively, an existing network of fee based professional advisors could be used provided suitable supervision is in place to assure technical quality.	H	The review could be designed in a manner whereby Transition Plans are assessed in terms of their ambition levels in comparison to sector peers, in addition to a completeness assessment. Advisory services could be tailored to focus on improving ambition with the help of internal or external sector experts.	H
Free Bench marks	This involves the publication of benchmarks that companies could use to compare their current emissions and emission reduction plans against sector norms, with benchmarks for different levels of ambition low, medium, high, and ambitious (but possible).	This option depends on the accessibility of the benchmarks to companies and the level of publicly available data that can be used to construct them. These benchmarks need to account for sector specific elements that may impact the ambition of a company's transition plan.	M	This option will require investment in the construction and publishing of relevant standardised benchmarks. The benchmarks could be based on CCC's 6th Carbon Budget balanced pathway, which would need to be converted into benchmarks for each major source/category of emission.	M	The provision of benchmarks would allow companies to assess the ambition levels of their Transition Plans in comparison to sector peers and this could act as a strong signal to the company's directors, employees, clients, investors, analysts, regulators and other stakeholder groups that the company is lacking in ambition.	M
Self-Checking Tools	Provision of tools for self-checking. This option would require the government to provide companies with a set of tools to assess whether they have met the requirements of the transition plan standard, and to assess the viability and ambition of their plan in relation to their peers.	The implementation of this option will depend on the accessibility of the tools to companies, their usability and relevance. These tools will need to account for sector specific elements that may impact the ambition of a company's transition plan, be flexible enough to incorporate varied metrics, and handle data from multiple sources with varying level of detail and carbon accounting methods.	M	This option would require investment on the in-house design, build, testing and maintenance of these tools. Hence the cost to the government was considered comparatively high. There are lower cost options, such as issuing a design specification for the tools so they can be developed, distributed and maintained by others.	H	The effectiveness of this approach relies on ensuring that companies understand how to use them and follow best practice in data input and the selectin of comparators. To maximise effectiveness, these tools need to be accompanied by a best-practice guide with examples of how they may be used to further ambition.	M

Option	Description	Difficulty of implementation		Cost to the government		Potential effectiveness	
Internal monitoring	An intermediary organisation or sector association would monitor the performance of companies against its transition plan and the ambition of the transition plan against the company's peers within the relevant sector. This option is similar to the propose and review option, but the advisor is a not independent of the company	The difficulty of implementation of this option is considered to be relatively high as it requires third parties to provide advisory and review services in a standardised manner. These third-parties or sector associations will therefore require some form of external oversight.	H	The cost to the government was assessed to be comparatively low for this option as it relies on activities performed by a third party. However, there may be costs incurred regarding the standardisation and oversight of the services provided by the third party or sector organisations.	H	This effectiveness of this approach relies on the degree of standardised that can be applied to the services provided by third party advisors and sector associations, while still allowing sufficient flexibility to reflect sector-specific needs.	H
Existing audit processes	The use of existing audits, such as ESOS audits or accounting audits to ensure that companies assess their performance on a regular basis. Outcomes of an audit of transition plan progress against target could be reported via existing reporting mechanisms which could include auditor statements in annual reports	Existing auditing processes will need to be leveraged to ensure that disclosures relating to Transition Plans are complete and accurately reflect the position of the company. In this context, the ease of implementation of this option would depend on alignment with the information reported under regulations such as the Corporate Sustainability Reporting Regulations, SECR, FCA Disclosure and Transparency rules etc.	M	The cost to the government was assessed to be medium for this option as accounting auditing process is currently undergoing reform to address weakness in the current system, and it may require more government time to enable transition plan auditing to be brought forward within the reform process.	M	This approach effectively prevents 'greenwashing' of a company's progress against the targets set in the transition plan and whether the information presented in the transition plan reflects the on-site position. However, the audit would not specifically focus on raising the ambition of the Transition Plan, just on reporting whether the transition plan is "on-track", "off-track", or "needs revision".	M
Bond Verification Methods	This option involves using the verification and certification process associated with Corporate Bonds to check that the funds have correctly used. Similar to the use of existing audit processes, this Option would require the company to provide regular updates on the funds raised by the corporate bonds and their use.	Existing bond verification processes will need to be leveraged to ensure that disclosure is provided and verified on a regular ongoing basis. Some bond verification processes include checking that particular outcomes have been achieved, and there are a range of different options for external verification and standards that companies can choice from.	L	The cost to the government was assessed to be comparatively low for this option as it relies on existing processes performed by a third party.	L	This approach effectively prevents 'greenwashing' in respect of the use of investments to progress implementation of the transition plan. While the verification would have the benefit of acting as a signal to investors that investment is being made in line with the prospectus, the verification itself would not specifically focus on raising the ambition of the Transition Plan.	L

We did not reach a definitive conclusion on the relevant merits of these different options, as their degree of difficulty and cost to government depend on a range of service and product design considerations, although the propose and review option potentially involved the least amount of additional effort on the part of the company. As a minimum, we would recommend **a combination of a propose and review process, a strengthening of existing audit processes and bond verification methods, and random audits** of planned verses actual as this will provide considerable insight into the progress of individual companies and the sector overall However, we recommend that the six approaches should be explored further through stakeholder consultation as the approach may need to vary by sector.

5.4 OPTIONS FOR TRACKING TRANSITION PLAN DELIVERY

Our approach to considering the potential options for tracking the delivery of transition plans, involved considering a number of methodologies that are commonly used to track the delivery of projects, the quality of deliverables, and to manage performance of service contracts, including management by exception methods.

Table 13 summarises our assessment of the potential strengths, complications and limitations of each option. A RAG rating has been included for each criterion.

Table 13 Assessment of options for tracking the delivery of transition plans.

Option	Strengths		Complications		Limitations	
Analysis of Actual vs Planned	Direct conclusions can be made regarding the feasibility of the existing plan and its milestones and its need for adjustments.	H	Plans are assessed on an individual company basis so can be time consuming. However, check can be semi-automated	L	The cost of this option depends on presentation of the relevant information in a set way to enable automation. There are many variations in layout.	L
Detection of Changes	Detects progress of individual companies over time but does not make comparisons with the planned transition milestones.	M	Plans are assessed on an individual company basis so can be time consuming. However, check can be semi-automated	M	This option depends on presentation of the relevant information in a set way to enable automation. "False detections" are common.	M
Consistency Checks	This method is a useful way of preventing low quality submissions, but it does not track progress of transition plan delivery.	L	Checks can be semi-automated, provided the data provided is of sufficient quality and flagged for administrative review.	M	This option depends on presentation of the data in a set way to enable automation as otherwise too many inconsistencies may be reported.	L
Statistical Analysis	This method does not provide direct links between progress achieved and companies' individual interim targets.	M	Requires cluster specific adjustments and the ease of implementation depends on similarity of companies in the same sector.	M	Statistical analysis has relatively few limitations compared to other options, but if sample sizes are small - confidence levels will be low.	M
Benchmarking	This method enables a relatively "instant" assessment to be made of a company's progress vs target.	M	A considerable amount of data is usually needed to construct a robust benchmark, including data on influencing factors.	H	This option depends on presentation of the data in a set way to enable automation. Selecting an incorrect benchmark can create anomalies.	H
Random Audit	Can be used to identify inaccurate returns and to deter "gaming" and inaction. It can also detect quality control problems.	H	This option is relatively easy to implement as qualified auditors are available. Plans can be assessed as & when received.	L	Analysis limited by the number of audits that can be performed. If the sample is too small there is no deterrent effect, if too large, burdensome.	L

We did not reach a definitive conclusion on the relevant merits of these different options, as **combination of these methods would normally be used to track progress of against delivery of time critical actions**. As a minimum, we would recommend a combination of a review of planned verses actual and random audits as this will provide considerable insight into the progress of individual companies and the sector overall. However, we recommend that the six approaches should be explored further after this project, in the light of decisions around which mechanisms will be used to ensure alignment and transition plan design standards.

In light of the Government's desire to tackle the issue of greenwashing in company reporting, **we also would recommend that the progress tracking process should involve an element of independent assurance that goes beyond the application of normal commercial Quality Assurance Systems**. Whilst a self-regulatory approach to monitoring delivery may seem more cost-effective in comparison to external verification, the latter is probably required to resolve this problem.

5.5 OPTIONS FOR USING TRANSITION PLANS AS A TRANSPARENCY TOOL

Our approach to considering the potential for Transition Plans to act as a transparency tool for citizens, consumers, and investors, involved considering firstly the **needs of different stakeholder groups for the disclosure of emission reduction plans and the timing, cost, impact and outcomes of specific actions**. Secondly, we considered how these different needs for transparency, could be satisfied in a single document, and what extra metrics and indicators might enable this, and the level of assurance user groups might need to be confident in the company's level of ambition for climate action and future investment priorities.

Table 14 summarises our assessment of a selection of information needs, the extent to which these needs are likely to be met by current proposals, and what extra features would increase usefulness, whilst Table 15 assesses these items against three criteria: degree of implementation difficulty, cost to the government, and perceived usefulness to citizens and consumers. Each element has been assigned a High (H), Medium(M), or Low(L) RAG rating against each criterion.

Table 14 Uses of Transition Plans as a Transparency Tool for Different Groups

Use	Information needs	Extent to which needs are likely to be met	What additional items would increase usefulness
Future Value	Investors need to assess how the value of the company will change e as the net zero transition is implemented	Current emission reduction plans mostly do not discuss future investment plans or proposed actions. Our proposed approach should help fill this gap.	**Hallmark or Quality Indicators** could be added to signal that independent verification that the proposed actions will reduce emissions in a timely, cost-effective and comprehensive way.
Ethical Screening	Investors, clients and employees may not want to associate with a company that is not committing to climate action.	It is difficult to screen out companies that do not really address the subject of future plans. Our proposed approach should help fill this gap.	**Level indicators** could be added to signal the level of ambition for climate action and that the company is decarbonising in line with UK pathways and tackling sustainability at the same time.
Impact on the Planet	Stakeholders want information on the company's impact on the planet, so they can apply pressure for change.	Our proposed approach focuses on net zero investment plans but disclosing the environmental impacts of actions is also a key aspect of the plan.	**Wheel type indicators** could be added to signal the climate impact of the company's operation, the transition plan and individual investments, broken down by impact type
Carbon Intensity Data	Clients and consumers need carbon intensity data to make informed choices about which products to purchase based on their climate impact. This can be difficult to find.	Our proposed approach provides carbon intensity data on the company's operation and supply chain, and investments, but allows companies to aggregate data in a way that reflects materiality of disclosure. Data on carbon intensity of products is not included.	**Carbon intensity indicators** could be added to signal the carbon emissions associated with the entire lifetime of products and services, including direct emissions by the company, upstream and downstream emissions from the supply chain and emissions induced or avoided post-delivery.
Long term Security	Investment plans can reveal whether the company is committed to providing long term employment in the UK.	The proposed approach partly addresses this need by setting out the company's investment plans, but the provision of future employment plan is covered.	**Climate Impact Outcome Indicators** could be added to transition plans to help identify number of and proportion of jobs dependent on different categories of carbon intensity.
Social Value	Local action groups want to see that companies are sharing a proportion of profits with their local communities.	Our proposed approach does not directly address the information need, although sharing details of outreach, training job creation activities is useful.	**Tick box indicators** could be added to signal that the plan has been screened for compliance with Just Transition Plan and Social Value criteria by local government.

Table 15 Assessment of options for using transition plans as a transparency tool.

Option	Implementation difficulty		Cost		Effectiveness	
Hallmark & Quality Indicators	Relatively easy to commission a design but will need to register it as a UK trademark and then apply for international protection under the Madrid Protocol to control use.	L	The costs of obtaining the initial trademarks are relatively low, with renewal fees due every 5-10 years. The costs of promoting the logo & protecting it from infringement are variable.	L	A hallmarked certificate is likely to benefit from the market standing of the certification scheme. A year of issue or expiry date can be added so that the companies have to reapply periodically.	H
Level indicators	Indicator levels can be superimposed on trademarks, but unique indicators could be registering as an industrial design which gives more international protection.	M	The costs of registering an industrial are relatively modest, with renewal fees due every 5years. The costs of promoting the logo & protecting it from infringement are variable.	M	Once established in the market, companies will hopefully start to take action to catch up with their competitors, particularly if investors mark down companies with low scores on the level indicators	H
Wheel type indicators	As above plus need to consider how visual appearance of wheel will change with different numbers of factors covered. Might rely on a trademark in the centre to protect.	M	The costs of registering an industrial are relatively modest, with renewal fees due every 5years. The costs of promoting the logo & protecting it from infringement are variable.	M	Wheel indicators are more visually complex and require more time to understand – so impact is likely to be lower than visually simple indicators, although they may have an important role to play.	L
Carbon intensity indicators	A number of organisations use and market carbon intensity indicators, creating one that stands out could be more costly	H	The cost of designing a unique carbon intensity indicator that is visually distinct but can both stand the test of time and evolve as the transition progresses are potentially quite high.	H	Carbon intensity indicator analysis is increasingly popular in the financial sector, and are the basis of cutting-edge metrics, so there is the potential for this sector to drive their use into the UK market	M
Climate Impact Outcome Indicators	The 17 UN Sustainable Development Goals indicator icons are increasingly displayed in company reports, so may need a different visual design approach.	H	The cost of designing a unique set of climate impact outcome indicators that can stand the test of time are potentially quite high. Costs of promotion in a crowded market are also higher/	H	Climate impact outcome indicators are widely used in annual reports so there is the potential to use a similar approach to increase impact, particularly if the UK Government adopts them.	M
Tick box indicators	Relatively easy to commission a design but harder to find a unique design that can be trademarked. Might just rely on copyright protection for a check list with tick boxes.	L	The cost of this option is fairly low, although might need to convert the checklist into a certificate with watermark and logo.	L	Checklists are in common use, so tick boxes are likely to have limited impact, but they can add value when combined with other indicators.	L

We did not reach a definitive conclusion on the relevant merits of these different options, as a combination of different visual indicators are increasingly used, with most indicators used to nudge consumer behaviour towards more sustainable options, rather than conveying information on performance. However, in a business reporting context, they can also act as a window into the environmental performance of a company's operations, brands, products and services, particularly where detailed performance data is not disclosed. **With careful design, visual indicators can act as a transparency tool for consumers, citizens and investors**.

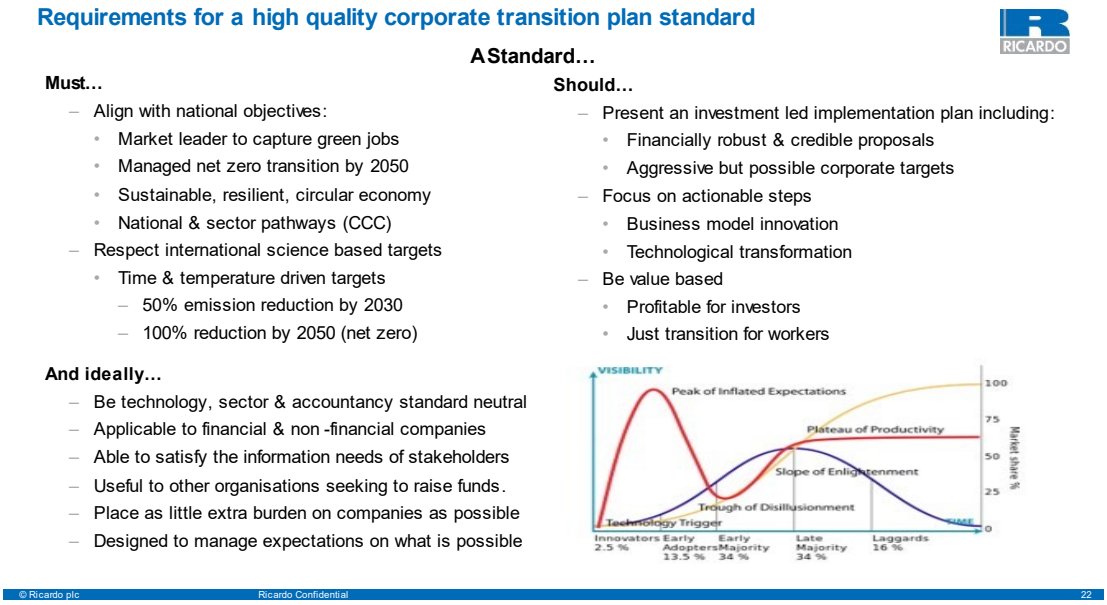
The main conclusion of our considerations in the area is that **an extra section could be added to the transition plan containing a schedule of authorised indicators** (including icons, scores, text and date) that can be used during that business planning cycle. Investment firms will be able to capture this schedule and will use it to compare the carbon credentials of companies operating in similar sectors, and other companies will progressively seek to keep up with their competitors.

6. AN INITIAL OUTLINE FOR A TRANSITION PLAN STANDARD

Our approach to preparing an initial outline of a transition plan standard based on our findings, involved considering what would address the need of practitioners to have clear guidance on the structure and contents of a high-quality net zero transition plan, whilst adding to the good practice we found in the corporate reports reviewed, and **shifting the focus towards presentation of forward-looking key performance indicators**.

To aid our thinking, we compiled **a list of requirements identified in our review of the background literature, and separated these into must, should and ideally should haves** (Figure 8), and used this as a checklist for assessing the extent to which our initial outline was able to cover the requirements.

Figure 8 Requirements for a high-quality corporate transition plan standard



One of the challenges that we needed to overcome, was how to design a transition plan standard that could cover financial institutions who have relatively small UK Scope 1 & 2 emissions compared with their Scope 3 emissions, which relate to the emissions of the companies that they have invested in, which are often located outside the UK, and the wider impact of companies on emissions outside the boundaries of Scope 1, 2 & 3.

To address this, we decided to **adopt the whole life cycle approach which covers not only all categories of Scope 1,2 & 3, but also emissions induced or avoided** as a result of the company's activities, products and services, including carbon stored in structures, biogenic and any other "out of scope" emissions. This approach is based on the life cycle impact assessment methods of PAS2080 and the ISO 14040 series of standards and ensures that the consequential impacts of a company's activities on emissions are factored in.

The second challenge that we needed to resolve was that of how to ensure alignment between the emissions reduction targets set within corporate transition plans and those set by UK national and international pathways. Here we concluded that **a segmental analysis of metrics by sector and country was needed** to enable this, although a stock market style compound indicator could be developed as an alternative (see section 5.5).

The starting point for our outline design was the recommendation that a high-quality transition plans should be designed so they can be used as **finance raising tools to raise the funds needed by listed companies** to implement them. We envisage that the transition plan needs to be initially designed to raise equity finance or debt finance on the sustainable bonds market in London (LSE, 2021), and would be included in the prospectus issued with the financial instrument traded in market. We also anticipate that the transition plans would be included in other types of financial instrument (e.g. stocks and shares) as the market evolves in light of the UK government announcement that it will become the world's first net zero aligned financial centre (HMG, 2021c).

As the net zero aligned financial centre develops, we anticipate that **the definition of what constitutes a climate-friendly project may expand** to provide interim transition finance (CBI,2021) that enables companies to catch up with the 1.5°C decarbonisation pathway for their sector, as well as for green transformation projects and interim finance for decarbonising business whose products will be needed by society up to a particularly

sunset date. However, this depends on the recommendations of Green Technical Advisory Group (GTAG. 2021) which is developing a UK Green Taxonomy that supports the UK net zero transition (HMG, 2021d).

In this context, we envisage that a high-quality plan will need to meet all the "Hallmarks" of a credible company transition (CBI,2021), and satisfies the LSE **requirement to prepare a transition framework that is aligned** to guidelines set out in the Climate Transition Finance Handbook required for participation (ICMA, 2020) i.e.

- Presents a climate transition strategy and governance that aligns with best practice
- Investment enables strategic change over time to its 'core' business activities
- Referenced against science-based targets and transition pathways
- Provides transparency of the underlying investment programme.

The third challenge that we needed to resolve was that of **expectation management in respect of what could be illustrated in a single high-level outline** for a high-quality net zero transition plan standard. We decided that our outline needed to focus on illustrating how our design concept could be applied to non-financial corporates as that was requested in the research brief. However, looking "over the horizon", we envisage a time when financial institutions would start to produce investment prospectuses based on the new transition plan standard when, for example, they start to update investment bonds that are not net zero aligned.

With this overarching approach in mind, Table 16 sets out **a high-level outline for the structure and contents of a High- Quality Net Zero Transition Plan** based on our assessment of what is needed as a minimum to create a credible transition proposition or investment prospective containing a net zero aligned transition plan. It is designed around collating the information disclosures that companies must make before raising funds, and to encompass each of the 36 components described in our assessment framework outline in Section 3.1.

Table 16 A high-level outline of a High-Quality Transition Plan

Component	Contents
Investment plan	Presents a **high-level business case** for investment in the company's net zero transition plan, including the rationale for the investment in terms of climate related risks and opportunities, aligning with national and sector net zero pathway targets, reducing environmental impact, increase resilience of supply chain, circular economy measures, and investment in long term research and/or business model innovation. Ideally the overall **investment strategy behind the transition plan should be illustrated** using the type of portfolio management charts used in presentations to investors, financial institutions and corporate group boards, such as. 2x2 matrices that show high level alignment of the investment plans with investors' priorities. The investment required should be broken down by primary purpose and instrument type and **related to their impact on the company's scope 1, 2 and 3 emissions**, emission avoided by customers and society, and on biogenic emissions, if relevant.
Long term strategic plan (All periods, with particular focus on 2030 onwards)	Outlines the whole net transition plan, dividing it into **discrete phases of investment** (e.g. up to 2025, 2026-2030, 2031 onwards) describing the main focus of investment in each period e.g. energy efficiency, renewable electricity, process redesign etc. Ideally the phases should **be presented in a timeline chart** showing the contribution of each investment to reducing emissions to net zero and meeting targets and milestones, and accompanied by an abatement capacity assessment (CPP, 2022). The challenges that need to be addressed in each phase of work should be outlined, and **key critical dependences, uncertainties in cost and benefits** and potential alternative emission reduction pathways derived from scenario modelling presented.
Medium term delivery plan (2026 to 2030)	The delivery plan should outline the **programme for investment** in reducing emissions over the next business planning cycle, including capital allocations made to each profit & loss centres for investment projects resulting in emissions reductions. Any major restructuring or capital investment projects should be highlighted, and a high-level results of **life-cycle cost benefit analysis** reported, along with details of how carbon and other environment impacts were priced into the investment appraisal. Ideally the plan should include **a marginal abatement cost curve (MACC)** or other chart that demonstrates that the investment programme has been optimised and the use of smart financing options and external co-funding detailed (Guidehouse, 2020).

Component	Contents
Near term action plan (Up to 2025)	This **Rolling Action Plan** should highlight projects that will be implemented over the next 2- 3 years, including details of project location, timelines, level of investment, expected impact on emissions reduction, sustainability, resilience and co-benefits. **Details of projects from previous action plans** that have been completed in the last reporting period, are still ongoing, carried over or cancelled should be provided, as this provides comfort to investors that their funds have and will be spent wisely. The projects discussed should **be presented as a prioritised list** with accompanying notes detailing any conditions precedent, and an assessment of level of risk involved.
Monitoring & evaluation (M&E) plan	The M&E framework should enable the company to **monitor the progress of the net zero transition plan against emission reduction targets** and provide investors with key performance indicators that they need to make buy, hold and sell decisions. Ideally a **dashboard of key performance indicators (KPIs) should be published** that enables stakeholders to monitor the inputs, outputs, impacts and progress of the plan. These KPIs would provide a high-level numerical and visual summary of progress against long term targets based on analysis of the metrics and data presented on actions completed, on-going, planned, and at the research stage. **Independent review, assurance and verification processes** should be outlined, and details of current accreditations and certifications included and on the dashboard.
Change management plan (CZ, 2020)	A **framework for planning the changes** is needed to deliver the net zero transition plan, including leadership, communications, capacity development, workforce planning, performance management, process definition, and roles should be set out. This plan should include a rolling stakeholder engagement process that allows **all stakeholders to contribute ideas for improvements and refinements** of the plans. Ideally this plan should **be supported by a supply chain map** that illustrates the areas of greatest change needed to realise emissions reductions and the timescales for implementation so consequences can be addressed to ensure a Just Transition. This section would also set out how the transition plan and its implementation would be Governed, including references to relevant codes of conduct, policies on offsetting and insetting, outsourcing and offshoring, and corporate social responsibilities.
Transparency & IT plan	Most investors expect companies to make open and transparent disclosures of their transition plans in annual reports, a separate transition framework document or in investor presentations as they will **need to publicly report on the alignment** of their investments with market and investment fund objectives to their investors. Transparency enables **informed customer choice and can accelerate changes in the market** by encouraging the purchase of less carbon intensive products, and more sustainable lifestyles. It also helps investors to assess the likely level of risk and return on their investments, and to screen investments for compliance with ethical requirements and for the potential for misuse of the investment funds. Whilst it may be possible to grant private investors access to commercially sensitive data under a confidentiality agreement, this **limits the type of investor** that will be interested in financing the transition plan and may **increase debt financing costs**. The amount of data that needs to be disclosed varies by sector, but as the UK net zero transition progresses, **demands for sustainability data will increase** and it is considered good practice to reflect a forward-looking view on this in transition plans. **The level of detail presented in annual reports needs to be carefully managed**, presenting too much or too little data can be used to greenwash investment plans or hide bad news or unquantified risks from investors, stakeholders and regulators. A transparency plan is a key step in identifying what information investors and other stakeholders need and should **define the IT systems** that will be used to support data collation, and ensure openness, collaboration and accountability at all levels.

Annex 9 compares our proposed net zero transition plan structure with that recommended by the other authors referenced in section 2.3. This includes an assessment of the degree of alignment with our proposed content.

6.1 TESTING AND VALIDATING OUR DESIGN CONCEPT

During the project, we developed a straw man proposal based on the outline for a transition plan standard set out in Section 3.4 and presented it at a workshop for practitioners. Copies of the key slides used to explain our Straw Man proposal are in Section 6.1, with a brief explanation of how the slides were presented to practitioners and the accompanying narrative. We also presented this straw man proposal to the Transition Plan Taskforce as part of a review of our research, with an outline of remaining evidence and knowledge gaps.

Our straw man proposal is based **a transition plan that addresses seven questions asked by investors**:

1. Which type of funding do you require?
2. Why do you need this investment?
3. When do you need the funds?
4. Where will you spend the money?
5. What impact will the investment have?
6. Who will be consulted, involved and impacted?
7. How will you ensure value for money?

The answers to these each of these questions is presented in the seven sections of the transition plan, which we have design so they can be **presented in a seven-slide pitch to investors**. However, we expect that this sales pitch would be accompanied by a supporting investment prospectus with detailed information for investors. The slide pack also could be used to present the business case for investment in the corporate boardroom, in situations where the company is able to fund the transition plan out of internal resources.

Our straw man proposal is built around meeting the requirements of:

- The ICMA Climate Transition Finance Handbook 2020 (ICMA, 2020), and other ICMA Guidance.
- LSEG Sustainable Bond Market Brochure Feb 2021, which outlines the different types of bonds that can be listed (LSE, 2021)

However, we have also taken the opportunity to add **a change management section that can be used to address issues around Governance of transition plan implementation**, partly because our research brief specified that we should not cover the same ground as previous standards development work by the TCFD, but also because fundamentally a transition plan involves the process of change from one state to another and a change management plan is considered to be best practice where a major change is being considered. In this context, it should be noted that the subject of generalised organisational change management is currently area of emerging best practice in respect of international standards, but that many of the fundamental concepts are set out in ISO20000-1: 2018, which defines change management processes for IT service management.

We have also decided that the IT and transparency plan should be separated out from the monitoring and evaluation (M&E) plan, so that issues of commercial sensitivity of cost data can be explained to investors. In this context, we assume that companies may be initially reluctant to disclose cost data, beyond the headline capital requirement (or allocation), but that **as the net zero transition progress companies will need to release more financial data** to maintain the confidence of major investors and to raise additional finance.

We have also assumed that the requirement for "bond holders" to provide evidence that assets being invested in align with the defined purposes of different type of sustainable bond, would be done, particularly in larger companies, via **an asset management system that tracks capital investment (on a "6 Capitals" basis)** as well as revenue spending to enable continuing performance monitoring and evaluation. Ideally this system would feed into an Integrated Reporting process that aligns with Social Responsibility Guidelines (ISO 26000) and assists in the company to report its contribution towards the UN Sustainable Development Goals (SDGs).

However, the **methodology is flexible enough to enable it to be used with traditional sustainability reporting frameworks, standards and metrics** used by UK companies to meet the non-financial disclosure requirements set out in UK regulations, including the new Climate-related Financial Disclosure regulations.

Finally, our seven-slide approach is designed to **minimise the additional reporting burden that the preparation of net zero transition plans and to streamline the current reporting processes**, which practitioners described as burdensome, by adopting a "trust but verify" approach to net zero transition plan, in which existing auditing processes are used to verifying the underlying data and to validate plan alignment.

6.2 A STRAW MAN PROPOSAL FOR AN OUTLINE OF A TRANSITION PLAN

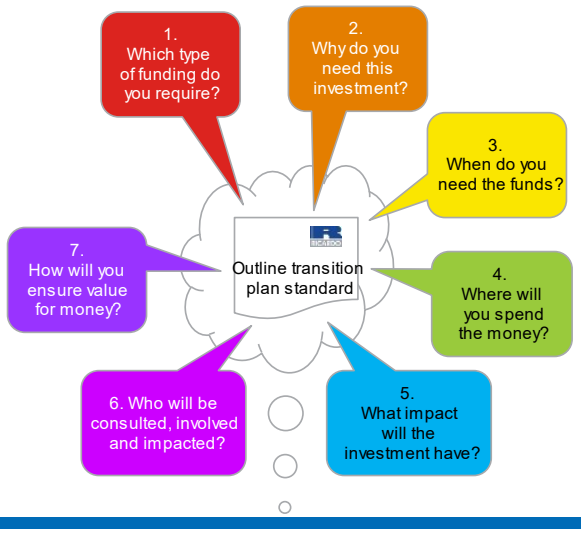
Slide 1 Our outline design concept – One transition plan should do it all!

This slide was used to introduce the 7 key questions that companies need to address in the 7-core sections of the transition plan, starting with which type of funding do you required. The presenter then outlined that the transition plan could be presented as a slide deck or report, and the main focus of the presentation was on the transition storyline and supporting narrative. The aim was to create a single transition plan document that met all the reporting requirements rather on the weaving components into annual reports and sustainability reports.

Our outline design concept: One transition plan should do it all!

- An **investment action plan**:
  - 7 key questions to answer
  - 7 core sections to complete
  - Power point slides or report
  - Focus on the transition storyline
  - Use existing management, audit/ survey and sustainability datasets .

	Net Zero Transition Plan
1.	High-level investment case
2.	Long-term strategic plan
3.	Medium -term delivery plan
4.	Near-term action plan
5.	Monitoring & evaluation plan
6.	Change management plan
7.	Transparency & IT plan



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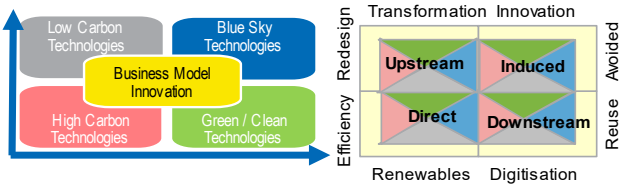
Slide 2 High-level Investment or business case

The high-level investment case presents the rationale for investment in the transition plan on a single slide. The presenter explained that the preparation process involved mapping out the different types of investment and demonstrating their alignment with the different bond purposes cover by the Sustainability Bond market. This could be done by plotting out the company's carbon footprint, including direct emissions, upstream and downstream emission and induced emissions and then identifying the type of funding required to decarbonise each element. The colours on the 3 diagrams related to the different types of bond purpose in the table.

High-level investment case

- Presents **rationale for investment**, including:
  - Climate related risks and opportunities
  - Alignment with national and sector pathway
  - Reducing environmental impact
  - Increased resilience of supply chain,
  - Circular economy measures,
  - Investment in long term research
  - Business model innovation .
- Uses charts to show:
  - High level alignment with investors' priorities .
  - Investment by purpose and instrument type
  - Impact on GHG emissions, broken down by:
    - Scope 1, 2 and 3 (upstream) & 3 (downstream)
    - Emissions avoided by customers & society
    - Biogenic & negative emissions (if relevant).
- Uses table to summarise investment case



Purpose	Cost £bn	% reduction	Focus
Sustainability/ Climate Action	200	40%	Circular Economy
Green/Blue/Brown	300	30%	Renewables
Interim/Catchup	100	10%	Efficiency
Social, Just, Equitable	100	10%	Close
Innovation / Resilience	100	10%	Transform
Total	**800**	**100%**	

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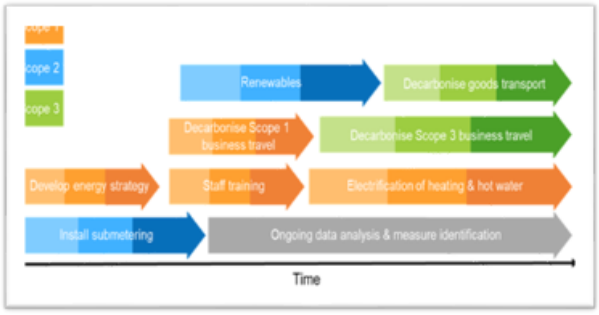
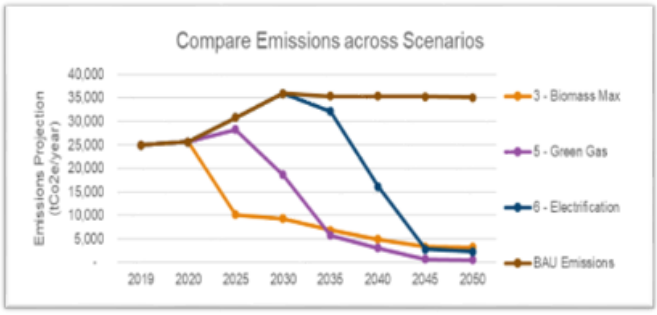
Slide 3 Long-term strategic plan

This slide was used to explain that the long-term strategic plan involves dividing up whole transition plan into phases of investment and illustrating when the emission reduction measures would be deployed in order to reach net zero, although with the results of scenario analysis of alternative pathways to net zero.

Long-term strategic plan

- Outlines the whole plan describing:
  - Discrete **phases of investment** (e.g. <=2025, 2026 -2030, 2031+)
  - Main focus of investment in each period
  - Key critical dependences,
  - Uncertainties in cost and benefits
- Use charts to show:
  - Contribution of phases to reducing emissions
  - Timeline for meeting targets and milestones
  - Alternative emission reduction pathways
- Support with an abatement capacity assessment





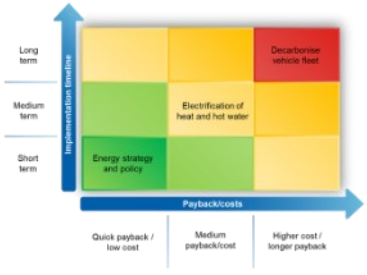
Slide 4 Medium-term delivery plan

This slide was used to explain that the medium-term delivery outlines in a high-level manner how the investment raised from investors will be spent and % emission reduction delivered over the next business planning cycle. There is also a need to illustrate that the investment programme has been optimised to ensure value for money, and to ensure that details are provided of the use of smart financing options, offsets etc.

Medium- term delivery plan

- Outlines the **programme for investment**:
  - Over the next business planning cycle,
  - Capital allocations to each profit & loss centre
  - Major restructuring & capital investment projects
  - High-level cost benefit analysis
- Ideally the plan should include
  - A **marginal abatement cost curve (MACC)**
  - or other chart that demonstrates that the investment programme has been optimised
  - Details of the use of smart financing options, external co-funding, carbon pricing, use of offsets etc.

ID	Work Package	£m Input	2026	2027	2028	2029	2030	£m Out	% Reduction	£/MtCO2e
1	Reduce scrap & rework rates	20							5%	
2	Switch to Electric Vehicles	10							10%	
3	Improve building efficiency	20							5%	
4	Employee reskilling package	10							2%	
5	Digitise major product line	50							5%	



Slide 5 Near-term action plan

This slide was used to outline forthcoming projects and other actions that will be taken to reduce emissions over the next 2-3 years on a rolling basis. Ideally details should be proved on the location of the investment, cost, % reduction and co-benefits realised. The colours on the chart indicate projects that are underway (green), planned (yellow) and in preparation (red). The icons are used to illustrate the link to different types of environmental, social and business co-benefits, which can be described in notes or supporting documentation.

Near-term action plan

- Highlights **forthcoming projects** including:
  - Project location
  - Timelines
  - Level of investment
  - Expected impact on emissions
  - Sustainability & resilience co-benefits.
- Details of projects from previous action plans
  - Completed, ongoing, carried over or cancelled
- **Presented as a prioritised list**
  - Implementing
  - Planned
  - Preparing

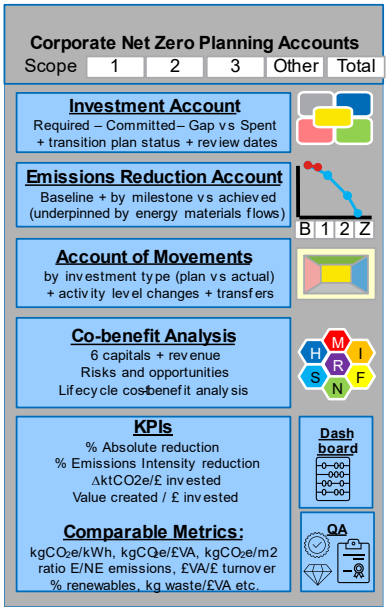
	Action	Location	Timeline	Cost £m	% Reduction	Co-benefits
1	New energy management system	UK	Q1 2022/23	15	1.2% ± 0.5%	
2	Switch to work from home meetings	UK	Q2 2022/23	5	2.5% ± 1.0%	
3	Reduce footprint of office buildings	EMEA	Q4 2022/23	20	3.5% ± 2.0%	
4	Support use of electric vehicles	UK & EMEA	Q1 2023/24	10-20	1 - 2%	
5	Upgrade to energy efficient lighting	Global	Q2 2023/24	20-40	1 - 2%	
6	Reduce waste, recycle & reuse	Americas	H1 2023/24	10-40	1 - 2%	
7	Install rooftop & carpark solar PV	Asia	2024/25	20-50	2 - 5%	
8	Lease zero carbon properties	Pacific	2024/25	100	5 - 10%	

Slide 6 Monitoring & Evaluation plan

This slide illustrates what a monitoring and evaluation plan should cover and supported by a corporate net zero planning account, summarising progress to date in terms of investment raise and spend, and reduction in emissions (after correcting for asset movements) and co-benefits realised. It also defines the metrics and key performance indicators that will be used to track progress on a dashboard that also displays certifications.

Monitoring & evaluation plan

- **M&E framework should monitor**:
  - Transition plan development status
  - **Investment to date against planned**
  - **Progress vs emission reduction targets**
  - **Co-benefits realised against targets**
  - Level of risks & opportunities
  - Change in asset value
  - Social added value
- It should also outline:
  - Process for the **independent review, assurance and verification** of technical and financial data
  - Current accreditations and certifications
- Use a **dashboard of key performance indicators** to enable stakeholders to monitor the inputs, outputs, impacts and progress of the plan.



Slide 7 Change management plan

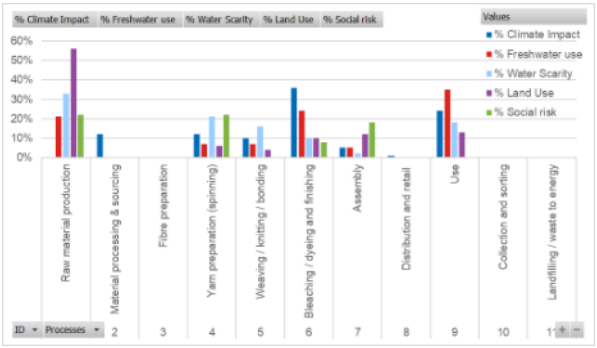
This slide illustrates the key components of a change management plan, which includes matters related to plan Governance, and a stakeholder engagement plan that ensures information on planned changes is communicated in a timely manner, so all stakeholders are on board, and have an opportunity to contribute. It also outlines the importance of considering the impact of change for the supply chain and a Just Transition.

Change management plan

- A **framework for planning changes** is needed to deliver the net zero transition plan, including:
  - Leadership
  - Communications
  - Capacity development
  - Workforce planning
  - Performance management,
  - Process definition, roles etc.
- Includes a **stakeholder engagement process** that gathers ideas for improvements and refinements:
  - Staff
  - Suppliers
  - Customers
  - Consumers
  - Shareholders
  - Society

- Use a **supply chain map** to show:
  - Areas of greatest change & reduction potential
  - Timescales for implementation of change
  - Just Transition consequences

Global Textiles Supply Chain (UNEP)



Slide 8 Transparency & IT plan

This slide illustrates the key components of a transparency and IT plan, including the sources of data that will be used, how commercial sensitivities will be managed, the level of disclosure for each type of data, and the independent assurance process that will be used to verify performance and to confirm that performance has not been greenwashed by concealing poor performance. The approach here is one of "Trust but Verify".

Transparency & IT plan

- Transparency & IT plan sets out:
  - **Main sources of data**, and commercial sensitivities
  - What level of disaggregated data will be disclosed
  - Who will undertake independent quality assurance
  - Description how KPIs & metrics will be calculated
  - The IT tools that will used to produce dashboard.
- Investors may ask for **access** to more detailed data:
  - To ensure funds are being used correctly
  - To check for greenwash in plans and reports
- Presenting too much or too little data may also:
  - Conceal bad news or unquantified risks
  - Be used to greenwash transition plans.

Data type	Source	Level of Disclosure	Independent Assurance
Carbon footprint by scope	Site surveys /meters/bills	Work Package	Environmental Auditor
Investment costs & benefits	Feasibility studies	Work Package	Environmental Auditor
Emissions reductions	Research projects	Work Package	Environmental Auditor
Impact assessment	Sustainability data	Work Package	Environmental Auditor
Asset classification	UK Green Taxonomy	Work Package	Approved Verifiers
Project expenditure	Accounting systems	Work Package	Auditor's Report on Accounts
KPI & dashboard data	Internal + suppliers	Corporate Level	Auditor's Report on Accounts

6.3 TURNING THE TRANSITION PLAN INTO A TRANSPARENCY TOOL

Our approach to considering how the different approaches outlined in this report could be used to convert our straw man proposal for a transition plan into a transparency tool, involved first considering what a future monitoring, governance and enforcement system might look like, and secondly drawing out the key themes that have emerged from the research. Then we considered how we could apply the options explored in the preceding sections, so they aligned with our outline design concept for a High-Quality Transition Plan.

Table 17 provides an example of how the metrics considered in this report could be combined with the key metrics set out in Table 4 of Section 3.4 to provide an insight for citizens, consumers, and investors into the progress of companies in decarbonising their business - in a company size and sector independent way.

Table 17 Additional metrics that could provide insight for citizens, consumers and investors.

Option	Examples	Comments
Scope 1 Decarbonisation	% kWh clean heat used, or Carbon Intensity of heat used % Green vehicles owned % Green fuels used % Refrigerant lost/year	Separate metrics for buildings and process, cars & LGV, and HGVs. Might count only zero emission vehicles or could include biofuels. Available from F-gas monitoring.
Scope 2 Decarbonisation	% Renewable Electricity used	Only self-generated or purchased under a power purchase agreement.
Scope 3 Upstream	Carbon Intensity per unit GVA	Data gathered from suppliers
Scope 3 Travel.	% Staff Commuting / Business Journeys by Low carbon means.	Include remote working, walking cycling, trains, buses, car shares, EVs.
Scope 3 Downstream	Carbon Intensity of Product & Service Delivery Logistics	Data gathered from suppliers
Circular economy metrics	Material efficiency of business, process, product, or service	Could have separate metric for % of products & services delivered digitally.
Outcome based key performance indicators (KPIs)	% Green Revenues % Jobs Decarbonised % Balance Sheet Decarbonised	Measures extent to which business has decarbonised its business model.

The benefit of using these metrics is that collectively they provide a good indication of how far a business has progressed in its decarbonisation journey and this enables intercompany comparisons to be made, particularly for businesses in the same sector. **A composite index could be created for different sectors that would enable investors to see how well aligned a business is with sector pathways**.

Companies could then be encouraged to **calculate their index value and have it independently verified, prior to publication without having to publish any underlying financial, production or confidential information**. The supporting data could be collected through annual returns to regulators and **random audits commissioned to ensure that companies are not greenwashing the progress of their transition journey**.

6.4 PRACTITIONERS' FEEDBACK ON THE STRAW MAN PROPOSAL

After presenting our straw man, **practitioners were asked to provide feedback on the following questions**.

- What are the strengths and weaknesses of the proposal approach?
- Are there any missing elements from our outline transition plan standard?
- What specific adjustments would be needed to use it in your sector/company?

Table 18 summarises some of the points raised by practitioners, along with a response outlining how the point could be addressed within the proposed structure, either as part of the accompanying narrative to the storyline presented in the investment plan, or by the addition of further elements to the transition plan standard.

Table 18 Responses to the points received at the Practitioner's workshop

Points	Response
What if we do not need external investment – do we still need this type of transition plan?	It is likely that investors will come to expect companies to prepare an investment plan, even if it is funded internally.
Where would we outline market and technical constraints and barriers to decarbonisation?	These could be outlined in the strategic plan section, or a separate annex, analysing the constraints and barriers to decarbonisation. The results of a PESTLE analysis could be used to cover political, economic, social, technological, legal and environmental issues and presented in a table.
The Governance of the transition plan does not seem to be covered like TCFD did?	Governance is included in the Change Management Plan.
We think the plan should start with a detailed contextual analysis, definition of terms used, and explanation of the standards applied in calculating emissions and use of offsets etc.	A contextual analysis could be included within the narrative accompanying the investment plan and/or an executive forward, or as a preface to the plan. Definitions of terms e.g. Net Zero and company policies on offsets could be set out in notes to the transition plan, in a methodology section, or in tabular form either in the plan or a Technical Annex.
How does the financial sector fit within the framework – our scope 1 & 2 emissions are small, and the standards are still developing with regards to what falls into our Scope 3 or "4" that we are having to develop our own.	By taking a whole supply chain approach and including induced emissions within the scope of the transition plan the emissions of the companies that financial companies invest in, become part of their scope 3 (or "4") emissions.
How often would you expect the transition plan to be updated – Annually seems too much – could we issue updates elsewhere?	These issues are outside the scope of the project, but we included them in this report to indicate that **the concerns of the practitioners mostly relate to the amount of work involved, and the level of detail that they will have to provide** and how it will align with numerous national and international standards that they already have to work to. In general, the **feedback from the Practitioner's workshop was positive**, and thus we concluded that no significant alterations were required to our Straw Man. Some participants thought it would **be challenging to get listed companies to disclose investment plans**, as this would be a departure from current reporting practice. This issue could be addressed by **allowing companies not seeking stock market funds to publish just the headline costs** with an explanation of how this would be funded. The costs of individual work packages could then be relocated to confidential annex of its Annual Return.
There is a need for alignment with and clear links to other standards (both pre-existing standards within sectors and with standards, both existing & upcoming, internationally). We should not have to repeat what has been disclosed elsewhere e.g. via SECR & TCFD.	
There is a need for recommendations regard the use of third-party data and standards.	
Will detailed guidance be provided on what should appear in each section of the plan?	
Have you considered the legal ramifications of publishing forward looking financial data– it could have a major impact on share price.	

6.5 TURNING OUR INITIAL OUTLINE INTO A STANDARD

Table 19 maps our outline net zero transition plan standard onto the ISO Harmonized Structure for Management System Standards (MSS) (ISO 2021) on the assumption that the transition planning and implementation will be an on-going corporate management and reporting process rather than an on-off activity.

A small number of additional features would be required to align with the Plan-Do-Check-Act (PDCA) operating principle/model used by ISO MSS standards e.g. ISO 9001 & ISO 14001, including the addition of Guidance on Resource Planning and continuous improvement processes. This mapping does not cover the possibility of specifying new transition plan labels which could be based around procedures in ISO 14024: 2008 (Type I Environmental Labels), ISO 14026: 2017 (Product Footprints) or a new set of UK Financial Benchmarks.

Table 19 Mapping the Initial Outline on the ISO Harmonized Structure for MSS

No.	Title	Suggested Contents
0	Introduction	• Outline of UK Government Proposal, TCFD, COP 26
1	Scope	• 1. Listed Companies, 2. All Organisations
2	Normative References	• See list of standards in Section 2.3
3	Terms and Definitions	• Translate definitions into ISO style definitions.
4	Context of the Organisation	• Likely impact of current and future market trends • Understanding the potential for decarbonisation • Identifying constraints and barriers to action. • Abatement Capacity Assessment (Scenario based) • Analysis of current and future financing requirements
5	Leadership	• Decarbonisation strategy • Short-, medium- and long-term goals • Development of a 2050 Target Operating Model • High Level Investment Plan (Business Case)
6	Planning	• Overall investment & risk management strategies • Strategic, delivery and near-term action Plans. • Governance & Change Management Plan
7	Support	• IT & Transparency Plan • Resource Plan

8	Operation	• Implementation Planning
		• Tools for tracking implementation
		  ○ Asset management and planning system
		  ○ Emissions reduction accounting system
		• Quality Assurance Plan (Code of Conduct)

9	Performance evaluation	• Monitoring & Evaluation plan
10	Improvement	• Conformity Assessment & Corrective Action.
A	Informative Annexes	• Use of Paris-aligned Pathways for Target Setting • Composite Indexes for Multinational Companies

6.6 REMAINING EVIDENCE AND KNOWLEDGE GAPS

At the end of the project, we identified a number of areas were further evidence and knowledge is required to enable the analysis and development of policy recommendations. These are listed in Table 20 below.

Table 20 A list of topics where further evidence and knowledge is required

Topic	Description of evidence and knowledge gap
Should the new Transition Plan Standard be described as Net Zero aligned – and if so, what should it be aligned to – UK national and sector pathways or international pathways?	At present, there is no agreement whether a net zero transition plan should be aligned with national or international pathways. Most authors assume that corporate transition plans should be aligned with international pathways, but as are research shows this would result in targets that do not align with the UK's Net Zero or sector pathways for the transition to Net Zero by 2050. One option is to require companies to demonstrate alignment with national pathways for all the countries that they and their supply chain operate in. This would be a very complex task unless target setting tools are provided to enable this process. Another option would be to require companies to comply with the pathway with the steepest decrease in emissions reduction, although this may place UK companies at a competitive disadvantage and may not help other countries to achieve their goals.
Where would the development of a new carbon budgeting standard sit in the international standards development framework?	During the presentation of our Straw Man proposal for a new Net Zero Transition Plan standard, practitioners questioned how the proposed standard aligned with the ongoing development of international accounting standards and the gaps and inconsistencies in the way Scope 3 (supply chain) emissions are categorised. The issue of so-called "Scope 4" emissions was raised as an example of where standards were evolving rather slower than the needs of practitioners, and which if resolved might make it easier to for large multinationals and financial institutions to adopt a holistic approach to prioritising investment, monitoring implementation evaluating net zero transformation plan effectiveness, and detecting greenwash. We envisage that the new transition plan standard could be eventually part of the ISO 14000 series and possibly sit alongside and complement ISO 14097:2021
What are the legal implications of treating Net Zero Transition Plans as Financial Instruments?	The concept of designing Net Zero Transition Plans so that they can be used to support Financial Instruments on the London Stock Market has various legal implications, including being subject to regulation by the FCA. Whilst this may ensure the financial robustness of the transition plan, instrument volume may become an issue as the requirements are rolled out to all listed companies. A further issue that may be worth additional research is whether there is a need to provide for the creation of Transition Related Special Purpose Vehicles (SPVs) to enable entire supply chains to transform to a circular economy model, to restructure and wind down businesses that are not required after 2050, to pool intellectual property rights and to create regulated asst bases to finance the transformation of major assets e.g. Integrated Steel Plant, Modular Nuclear Power Stations which companies would find difficult to raise finance for due to the timescales for payback. An analysis of the legal implications was outside the project scope. It should be noted that Ricardo does not provide financial, investment or legal advice to clients.
Can the investment plan idea be adapted for use in the Financial Sector?	This question was raised by both at the workshop for practitioners and during the presentation of the straw man proposals to the Transition Plan Taskforce. In response we have outlined how by adopting a whole life cycle approach which covers all categories of GHG emissions, opens up the possibility of using the investment planning approach for companies in the financial sector, particularly if the new standard adopts UK (& EU) Benchmark Regulation compliant portfolio management benchmarks instead of International Pathway based benchmarks. We have also outlined how we expect that over time, other financial instruments currently outside of the sustainable bond market will need to incorporate net zero transition plans that seek to "invest and transform" companies to achieve the UK Government's objective of creating the world's first net zero aligned financial centre. Whilst the principles that underpin our straw man proposal are transferable, there are some aspects that would need to be changed to enable its use in the financial sector, with the long term plan focusing on investing in the development of innovative solutions for hard to decarbonise sectors, the medium term plan focussing on innovating business models, and the near term plan focussing on

Topic	Description of evidence and knowledge gap
	tackling companies that are playing catchup or on shifting investment from underperforming companies to companies that are able to decarbonise faster. However, as we only had time to develop one straw man proposal, we have had to leave the task of developing a version of our straw man for the financial sector.
What cutting edge metrics would your proposal approach enable?	The term cutting edge metrics is generally infers a data driven approach to the production of metrics, often enabled by the use of artificial intelligence (AI), big data and machine learning. In this context, there is scope for these technologies to be used to collate and analyse carbon intensity, investment and asset data, as well as project data provided data sharing agreements are in place, or with permission. In particular, Agent based technology could be used to collate data from diffuse data sources for analysis, whilst neural networks could be used to spot greenwash. Case base reasoning could be used to identify potential decarbonisation solutions. And check costs against project databases. In addition, expert or rule systems could be used to undertake eligibility checks and to screen out ineligible investments. In combination, these technologies could also be used to support carbon budget planning, monitor progress of national net zero plans, and evaluate outcomes.
Why not Geo-Tag investment assets to enable asset related performance data to linked to them, and new asset ownership models and associated value-added services to be developed?	Geo-tagging could be used to improve the transparency of investments and asset movements and to geographically track investment in corporate assets, their carbon intensity and climate impact in a way that is not dependent on ownership. This will make it easier to monitor progress in emissions reduction, particularly if asset can be electronically linked to gas, electricity, water and heat meters, so that energy performance can be monitored for the purpose of ensuring asset value. Geo-tagging would also help companies to plan the replacement of assets at end-of-life, and to identify potential opportunities for product reuse and remanufacturing and enabling the tracking of fossil fuel burning equipment in the run up to 2050. At present, there is no equivalent of UPRN's for business assets -which means that energy and environmental data from different datasets much be address matched, which leads to a loss in data coverage and quality when asset transfers happen.
Will the proposed new UK Green [*Investment*] Taxonomy cover transformative technologies and business model innovation?	The Green Taxonomy Advisory Group (GTAG) is presently working up ideas for a new UK Taxonomy to help investors classify investments in sustainability projects. It is not clear whether this could be extended to cover all the different types of investment that will be needed to complete the UK's transition to Net Zero, including for instance transformation of whole supply chains int circular economy models, and the provision of interim finance to maintain the operation of carbon intensive assets that are needed by the UK economy until alternatives are found etc.
Could the proposed transition plan outline be adapted for used by SMEs and other organisations?	Our strawman proposal for a transition plan presented is designed to be flexible and to help companies to present a clear storyline with supporting narrative about their plans to respond to global and national efforts to reach net zero by 2050. It could be similarly used by unlisted organisations, including SMEs, Governments, Local Authorities, NGOs, Charities, Areas, Networks and Community Groups. The near- term action planning section can be used to start the process of developing a transition plan, and for smaller organisations, this along with a combined high level investment case and strategic plan might be enough to agree investment priorities, whilst change management, monitoring and evaluation, and transparency plans can be developed as part of the delivery planning process. Smaller organisations may want to focus on reducing Scope 1 & 2 emissions, whilst Areas, Networks and Community groups may decide to focus on selected Scope 3 emissions where they are able to influence behaviour or organise collective action. The optional sections may also be particularly useful for some organisations. A constraints and barriers section could be used to facilitate brainstorming sessions with different stakeholder groups, whilst the methodological section would help those who are less familiar with carbon accounting processes to get up the learning curve. The schedule of indicators could be used by community groups to help residents to make informed purchasing decisions and to support local businesses. It may be worth creating bronze and silver versions of the transition plan standard to cater for these options, so it is clear which transition plans meet the gold standard

ANNEXES

ANNEX	Title
1	References
2	Abbreviations
3	Glossary of Key Technical Terms
4	Key to events on timeline
5	Company Emissions Reduction Plans Reviewed
6	Overview of the Analytical Framework
7	Key to Analytical Framework
8	Comparison of our proposed net zero transition plan structure with that recommended by other authors

Annex 1 References

The following sources have informed the development of this report:

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Annex 2 Abbreviations

The table below explains the abbreviations used in this report.

Abbreviation	Definition
2DS	2 Degrees (an IEA Scenario)
ACT	Assessing low-Carbon Transition
ARGA	(Proposed) Audit, Reporting and Governance Authority
AI	Artificial Intelligence
APPG	All-Party Parliamentary Groups (UK)
B2DS	Below 2 Degrees (an IEA Scenario)
BEIS	UK Government Department for Business, Energy and Industrial Strategy
BoE	Bank of England
BSI	British Standards Institution
CA100+	Climate Action 100+
CAT	Climate Action Tracker
CBAT	Carbon Budget Allocation Tool
CBI	Climate Bonds Initiative
CBS	Carbon Budget Standards
CCA	UK Climate Change Agreements
CCC	UK Climate Change Committee
CDP	Carbon Disclosure Project
CEBN	Cutting Edge Benchmarking Norms
CIA	Carbon Impact Analytics
CIAL	Carbon Investment Assurance List
CICS	Climate Investment Classification System
CIFF	Children's Investment Fund Foundation
CIL	Carbon Intensity Labels
CITS	Carbon Intensity Tagging System
CNP	Carbon Neutral Protocol
CO2	Carbon dioxide
COI	Climate Outcome Indicators
COP 21	The 2015 United Nations Climate Change Conference (Conference of Parties)
COP 26	The 2021 United Nations Climate Change Conference (Conference of Parties)
Covid-19	An infectious Coronavirus disease caused by the SARS-CoV-2 virus discovered in 2019
CSLN	The Climate Safe Lending Network
CTI	Carbon Tracker Initiative
DEC	Display Energy Certificates
DEFRA	Department for Environment, Food & Rural Affairs (Defra)
DLAG	Disclosures and Labels Advisory Group

Abbreviation	Definition
DWP	Department of Work and Pensions
EIB	European Investment Bank
ELIS	Environmental Labelling & Information Schemes
EPC	Energy Performance Certificate
ESG	Environmental, Social and Governance
ESOS	Energy Savings Opportunity Scheme
ETC	Energy Transitions Commission
ETS	Emissions Trading System
EU	European Union
FCA	Financial Conduct Authority
FTSE	Financial Times Stock Exchange Index (of companies on the LSE)
GAAP	UK Generally Accepted Accounting Principles
GDP	Gross Domestic Product
GFANZ	Glasgow Financial Alliance for Net Zero
GHG	Green House Gases
GRI	Global Reporting Initiative
GTAG	Green Taxonomy Advisory Group
HMG	Her Majesty's Government
HMSO	Her Majesty's Stationery Office
HMT	Her Majesty's Treasury
ICMA	International Capital Market Association
IEA	International Energy Agency
IEMA	Institute of Environmental Management and Assessment
IFRS	International Financial Reporting Standards
IIGCC	Institutional Investors Group on Climate Change
IIRC	International Integrated Reporting Council
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
ISSB	International Sustainability Standards Board
IT	Information technology
KPIs	Key Performance Indicators
LLP	Limited Liability Partnership
LSE	London Stock Exchange
M&E	Monitoring & Evaluation
MACC	Marginal Abatement Cost Curve
MCP	Minimum Carbon Price
MER	Minimum Emissions Reduction

Abbreviation	Definition
MGE	Monitoring Governance and Enforcement
MSS	(ISO) Management System Standards
NCI	New Climate Institute
NDC	Nationally Determined Contributions
NGOs	Non-governmental Organizations
OECD	Organisation for Economic Co-operation and Development
OU	Oxford University
PAS	Publicly Available Specification (UK BSI)
PCAF	Partnership for Carbon Accounting Financials
PDCA	Plan-Do-Check-Act
PESTLE	Political, Economic, Social, Technological, Legal and Environmental factors
PLC	Public Limited Company
PPE	Public Procurement Eligibility
PRA	Prudential Regulation Authority
PRI	UN Principles for Responsible Investment (An international network of investors)
RAG	Red-Amber-Green
REGOs	Renewable Energy Guarantees of Origin
ROCs	Renewable Obligation Certificates
SASB	Sustainability Accounting Standards Board
SBTI	Science Based Targets Initiative
Scope 1	Direct emissions from owned or controlled sources
Scope 2	Indirect emissions from the generation of purchased electricity, steam, heating and cooling
Scope 3	All other indirect emissions not covered by Scope 2 that occur within an organisation's wider value chain (both activities upstream and downstream of the company's operations)
"Scope 4"	Emissions avoided or induced by use of products or services not covered by current definitions of Scopes 1 to 3, which may include emissions enabled by home working. This term is not yet formally defined. The GHG Protocol uses "avoided emissions" instead.
SECR	UK Streamlined Energy and Carbon Reporting
SDG	United Nations Sustainable Development Goals
SG	Scottish Government
SMEs	Small and Medium sized Enterprises
SPB	Sector/Pathway Benchmark
TCFD	Task Force on Climate-Related Financial Disclosures
TEG	EU Technical Expert Group on sustainable finance
TPI	Transition Pathway Initiative
TPR	The Pensions Regulator
TPT	Transition Plan Taskforce
UK	United Kingdom

Abbreviation	Definition
UKETS	United Kingdom Emission Trading System
UN	United Nations
UNFCC	United Nations Framework Convention on Climate Change
WBCSD	The World Business Council for Sustainable Development
WEF	World Economic Forum
WEM	IEA World Energy Model
WWF	World-Wide Fund for Nature

Annex 3 Glossary of Key Technical Terms

The table below provides a brief explanation of some key technical terms used in this report.

Term	Definition
Carbon Neutral	Carbon Neutral is a label that can be applied to organisations, activities, products and services that signifies that the emissions associated with the certified item have been measured, verified and offset by the purchase of emission reductions by other organisations. It usually also signals that action has been taken to minimise emissions by the item or will be taken when technically feasible and cost-effective to do so, although some certification standards do not require such actions. Carbon Neutral is the longest established term used to communicate information on the carbon footprint of different businesses, products and services and the lifecycle measurement approach used is underpinned by PAS 2050 (2008), PAS 2060 (2009) and PAS 2080 (2016) standards, and emerging international standards such as ISO 14064 to 14069
Climate Neutral	Climate Neutral certification is an alternative to Carbon Neutral certification for companies. The term climate neutral is preferred by some international organisations as it expresses the ultimate goal of global efforts to reach "absolute zero" carbon emissions with no offsets. The term is not currently used in UK or International Standards, but has been formally defined by the European Commission in COM(2018) 773. Certification is based on the same standards as Carbon Neutral.
Carbon Negative / Climate Positive	Climate Positive or Carbon Negative is used to signify that the company is removing more carbon emissions from the atmosphere that it is emitting. These terms are often used alongside Carbon Neutral and Climate Neutral, as certification standards are still evolving in this area.
Financial Instrument	A financial instrument is a monetary contract between two parties, which can be traded and settled, for example on the London Stock Exchange. In the context of our straw man proposal, the type of financial instrument discussed relates to debt finance raised on the Sustainable Bond Market to support the implementation of transition plans, including both "Use of Proceeds" and "General Corporate Purpose" Instruments (LSE, 2021).
Greenwashing	Greenwashing is defined as providing a misleading impression of the environmental impact of a particular product, service, brand or business. Greenwashing often occurs when companies make green claims that show how a product, service, brand or business provides a benefit or is less harmful to the environment in advertising materials (CMA,2021). Greenwashing (or carbon washing) can also occur in company reports.
Net Zero	'Net Zero' refers to achieving an overall balance between emissions produced and emissions taken out of the atmosphere. This balance may be achieved by reducing emissions within the organisational boundary and then offsetting any remaining emissions by removing emissions from the atmosphere. In the short term, companies may decide to offset emissions by purchasing emission reductions in other organisations, but in the longer term, companies will need to reduce their emissions or pay for the use of "negative emissions technologies" to remove emissions.
Net Zero Aligned Transition Plan	This means that the company's emissions reduction plan aligns with international, national and sector decarbonisation pathways, which assume most emissions can be eliminated by 2050, leaving only a small amount of "hard to eliminate" emissions that need to be balanced out by using "negative emissions technologies" to remove emissions.

Annex 4 Key to Events on Timeline

The table below provides a brief outline of the events highlighted on the timeline in Section 2.2

Date	Description of event
Jun-17	TCFD publishes recommendations Report
Oct-17	UK Government Clean Growth Strategy outlines plans for streamlined Carbon reporting
Oct-18	IPCC 1.5C Report
Nov-18	The Companies (Directors' Report) and LLP (Energy and Carbon Report) Regulations 2018
Mar-19	UK government publishes Environmental Reporting Guidelines
May-19	CCC publishes: a Net Zero Report
Jun-19	UK Government legislates target for Net Zero by 2050
Jul-19	UK Government publishes Green Finance Strategy
Nov-19	SBTi publish Towards a Science-Based Approach to Climate Neutrality in the Corporate Sector
Jun-20	UNFCC Race to Zero campaign announced
Sep-20	SBTi publish Foundations for Science-Based Net zero Target Setting in the Corporate Sector
Nov-20	UK Government's 10 Point Plan outlines mandatory climate related reporting by 2025
Nov-20	PCAF release the Global GHG Accounting and Reporting Standard for the Financial Industry
Dec-20	CCC Publishes 6th Carbon Budget
Dec-20	CCC Publishes: The role of business in delivering the UK's Net Zero ambition
Dec-20	Prototype for climate-related financial disclosure standard by the "Alliance"
Jan-21	Updated International Integrated Reporting Framework published
Apr-21	European Commission issue a proposed Corporate Sustainability Reporting Directive
Apr-21	SBTi release Financial Sector Science-Based Targets Guidance
Jun-21	The Carbon Budget Order 2021 - 6th UK Carbon Budget comes into force
Jun-21	G7 Finance Leaders Communique
Jun-21	Value Reporting Foundation formed by merger of IIRC & SASB
Jul-21	GTAG begin development of a UK Green Taxonomy
Sep-21	IIGCC Net Zero Standard for Oil and Gas Published
Oct-21	UK Government Posts Net Zero Strategy
Oct-21	UK Government announces mandatory TCFD reporting for largest companies
Nov-21	COP26 (Glasgow)
Nov-21	Glasgow Climate Pact signed
Nov-21	EIB launch Paris Alignment for Counterparties Framework
Nov-21	UK Government announcement to impose Transition Plan requirements
Jan-22	The Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022
Nov-21	UK Government announcement of mandatory disclosure of Transition Plans
Jan-22	The Limited Liability Partnerships (Climate-related Financial Disclosure) Regulations 2022
Apr-22	UK Transition Plan Taskforce begins development of a gold standard Transition Plan

Annex 5 Company Emissions Reduction Plans Reviewed

During the course of the work, we reviewed the following company emission reduction plans.

Company	Sector	Depth
Abrdn PLC (Standard Life)	Finance	Quick
AG Barr PLC	Manufacturing	Quick
Anglican Water*	Water	Quick
Associated British Foods	Manufacturing	Detailed
AstraZeneca PLC	Manufacturing	Detailed
Aviva plc	Finance	Detailed
Balfour Beattie	Construction	Quick
Bank of Ireland Group plc	Finance	Quick
Barratt Developments PLC	Construction	Detailed
Biffa plc	Waste & Recycling	Detailed
BP PLC	Energy	Detailed
British Land Co PLC	Construction	Quick
BRITVIC PLC	Manufacturing	Quick
BT plc	Services	Detailed
Centrica plc	Energy	Quick
Compass Group PLC	Hospitality	Quick
Cranswick plc	Agriculture & Land Use	Detailed
Croda International PLC	Manufacturing	Quick
D S Smith	Waste & Recycling	Quick
G Fresh*	Agriculture & Land Use	Quick
Go-Ahead Group plc	Transport	Detailed
HSBC plc	Finance	Detailed
IAG	Aviation	Detailed
ITV PLC	Services	Quick
Jet2 plc	Aviation	Quick
John Lewis Partnership	Retail	Detailed
Johnson Matthey PLC	Manufacturing	Quick
Land Securities Group PLC	Construction	Quick
Legal & General plc	Finance	Quick
Lloyds Banking Group plc	Finance	Quick
Marks & Spencer plc	Retail	Quick
National Grid plc	Energy	Quick
Natwest Banking Group plc	Finance	Detailed

Company	Sector	Depth
Redrow plc	Construction	Quick
Rentokill Initial plc	Services	Quick
Ricardo plc	Services	Quick
Rolls Royce Holdings PLC	Manufacturing	Detailed
Royal Dutch Shell plc	Energy	Quick
Schroders PLC	Finance	Quick
Severn Trent Plc	Water	Quick
Spirax-Sacro Engineering plc	Manufacturing	Quick
SSE PLC	Energy	Detailed
Stagecoach Group plc	Transport	Quick
Tesco PLC	Retail	Detailed
Unilever plc	Manufacturing	Detailed
United Utilities Group PLC	Water	Detailed
Viridor*	Waste & Recycling	Quick
Vodafone	Services	Quick
Whitbread plc	Hospitality	Quick
Wynnstay Group plc	Agriculture & Land Use	Quick

* These companies are subsidiaries of other organisations not listed on the FTSE 100 or All Share Indexes.

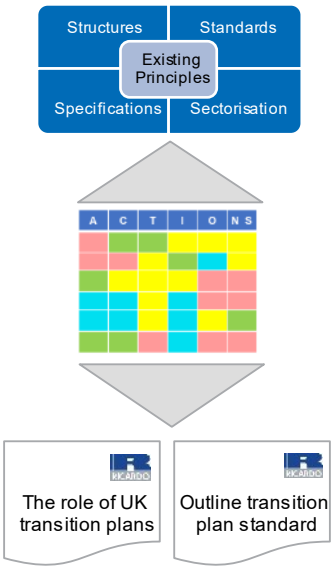
Annex 6 Overview of the Analytical Framework

In this section, we briefly outline the background to the analytical framework used to assess corporate emission reduction plans, how it was developed and used during the research, and how corporate plans were selected.

Slide 1 An outline of how the analytical framework fits in the overall methodology

Methodology

- Our approach involves using a n **analytical framework** that helps us to focus on the four research questions and subtasks, including:
  - Mapping out the key developments in relation to business emissions and how transition plans relate to these, including the **evolution of the existing high-level principles**.
  - Thinking about **how transition plan structures and standards can best be leveraged** to accelerate business emissions reduction as part of an evidence based approach.
  - Identifying and assessing **high level options for ensuring alignment** between company transition plan ambitions with the UK's Sixth Carbon Budget and Net Zero Strategy.
  - Considering whether transition plans could be used as a **tool for transparency to citizens and consumers**, as well as investors, and how this could be achieved.
  - Condensing down our analysis into an easy to read report containing informed, critical and visionary thinking, including a **mock up of an outline transition plan** standard.



Slide 2 An outline of how the analytical framework was developed

A closer look at the analytical framework and its contents

- The **analytical framework** was developed by:
  - Reviewing the **key components of 15 transition plans** and adding commonly found items to an "inclusive contents list"
  - Converting the contents list into a **storyboard structured** around the word 'Actions" and a 6 by 6 framework matrix.
- This enabled us to:
  - **Create** a storyboard of the typical contents of existing transition plan, which could be used to assess the contents of other plans
  - **Visualise** the results high level assessments, and then zoom in on the specific information gaps in current transition plans.

Analysis	Commitments	Targets	Investment	Operation	News Stories
Contextual Analysis	Measurement & control framework	Longer Term Trajectory & Target	Investment plans	Performance Review Process	New Structures
Ambitions & Aspirations	Culture Shift & Behavioural Change	Tactical Approach (Action Plan)	Risk Management	Key Performance Indicators (KPI)	New strategies
Corporate Responsibilities	Code of conduct (Governance)	Technology Pathways / Roadmap	Executive Incentives	Carbon Offsetting & Inseting Principals	New Systems
Impact Analysis (Scopes 1-3 etc)	Stakeholder Engagement	Target Operating Model	Supply Chain Initiatives	Outsourcing & Offshoring Policies	New Skills
Risk & Opportunity Assessment	Circularity & Sustainability	Interim Targets & Milestones	Innovation Projects	Options Appraisal (Life cycle analysis)	New Staff
Quality Assurance (Systems & Standards)	Comprehensive Disclosures	Triangulation & Alignment	Information Technology	Outreach & Training	New Style

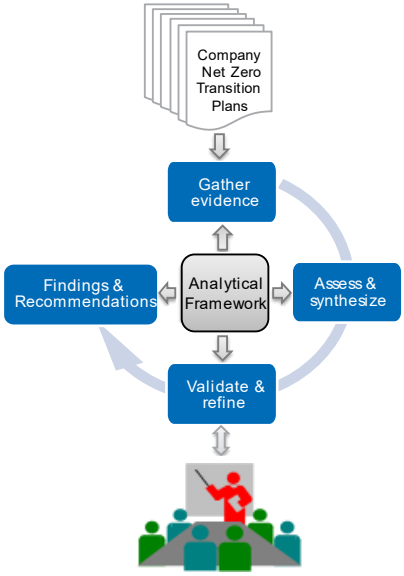
Low risk Medium risk High risk Opportunity for Innovation

This is an example of how we used the analytical framework to illustrate the areas were there was room for improvement

Slide 3 An outline of how the analytical framework was used

Using the Analytical Framework

- We used the analytical framework to systematically:
  - Gather evidence from existing corporate transition plans and **identify what to review and extract** in the compressed timelines
  - Guide the evidence assessment and synthesis of findings **defining the key components** of a high quality transition plan
  - Develop an outline for transition plan standard that can be presented to practitioners for **validation and refinement**
  - Ensure our recommendations for the transition plan standards are **clearly robust and grounded in experience and evidence**



Slide 4 An outline of how corporate transition plans were selected for review

Selecting example transition plans for review

- Our selection methodology involved:
  - Starting with **SBTi database** & **Net Zero Scoreboard,** we reviewed 50 reports and selected 38 UK corporate emission reduction plans to review.
    - A **mix** of FTSE 100 & FTSE All Share Index companies
    - A **spread across 12 sectors** – Agriculture & Land Use, Aviation, Energy, Finance, Manufacturing, Construction, Transport, Retail, Hospitality, Services, Water, Waste & Recycling.
    - The **plans were downloaded** from the sustainability section of the company's website along with the company's latest Annual Report (i.e. 2020 or 2021).
  - The **key characteristics** used during initial screening were:
    - A **reasonably compact and coherent** transition/action plan (pdf or online)
    - Aligned with **HM Government's Transition Plan principles** (see box)
    - A set of "**actionable steps**" - ideally a mix of near term mitigation measures (<2030) and longer term actions, although some actions may involve investing in R&D or options appraisals.
  - A **short list** of 18 net zero plans was developed by quickly scanning to check they covered most of the boxes in the analytical framework's "Targets" column

HMG principles: Transition Plans should:

- Consider the government's net zero commitment (or provide an explanation if they have not done so).
- Set out:
  a) high level targets being used to mitigate climate risk including GHG emissions reduction targets
  b) interim milestones.
  c) Actionable steps the organisation plans to take to hit those targets
- Be aligned with TCFD disclosure rules
- Be part of UK sustainability disclosure requirements once *[robust]* standards for a transition plan emerge.

TCFD principles: Disclosures should:

1. Present relevant information on …(Governance, Strategy, Risk Management, Metrics & Targets)
2. Be specific and complete
3. Be clear, balanced, and understandable
4. Be consistent over time
5. Be comparable among organizations within a sector, industry, or portfolio
6. Be reliable, verifiable, and objective
7. Be provided on a timely basis

Annex 7 Key to Analytical Framework

The table below provides a brief explanation of the technical terms used in the analytical framework.

Key	Term	Definition
A1	Contextual Analysis (or context analysis)	An analysis of the changing political, business, economic, regulatory, social landscape, and current and future trends in the market place.
A2	Ambitions & Aspirations	This section sets out the company's long-term goal for achieving net zero. The terms ambition and aspiration are often used interchangeably but have different meanings. An ambition is a desire to achieve a specific long-term goal that is expressed in terms of a measurable objective, whilst an aspiration is a desire to achieve a wider objective, which is expressed without a measurable objective or timeline.
A3	Corporate Responsibilities	The corporate responsibility section defines which categories of emissions the company considers it is responsible for. This will normally include those emitted at the company's premises (Scope 1) and as a result of its energy demand (Scope 2), It may also include emissions by the company's supply chain, both upstream and downstream of its premisses, or in use or at end of life (Scope 3). The resulting "boundary" usually defines the types of data and metrics that will be presented.
A4	Impact Analysis (Scopes 1-3 etc)	The impact analysis section of a transition plan usually provides a breakdown of Greenhouse Gas emissions which the company is responsible for, by scope, category and type in accordance with the GHG Protocol Corporate Accounting and Reporting Standard (WRI & WBCSD, 2004) or other company emissions reporting standards
A5	Risk & Opportunity Assessment	An assessment of the impact of climate-related risks and opportunities on financial position in line with TCFD's Guidance (TCFD, 2021a & b). Ideally this section would also summarise the governance arrangements for the assessment of the financial impact of climate related risks and opportunities, and the associated financial strategy, risk management processes, and the metrics and targets used to manage them.
A6	Quality Assurance (Systems & Standards)	The quality assurance section of a transition plan usually outlines the quality assurance and management systems used by the company during the measurement and reporting of emissions, including details of applicable national and international reporting standards, and independent technical review and/or verification by qualified auditors.
C1	Measurement & control framework	The measurement and control framework section sets out the technical standards used manage and reduce GHG emissions arising from the company's activities, including were relevant Scope 3 emissions. Examples include ISO 14080, PAS 2060, PAS 2080 etc.
C2	Culture Shift & Behavioural Change	This section of the transition plan addresses boardroom policies aimed at motivating organizational change, and changing behaviour, operating practices, and business processes to focus on reducing emissions.
C3	Code of conduct (Governance)	This section usually sets out a code of conduct for open and inclusive just transition planning, including arrangements for oversight, ownership and action at all levels of the business, and fair treatment of suppliers. It would also outline the governance arrangements for the implementation of the transition plan and associated risk management processes.
C4	Stakeholder Engagement	This section outlines the process used by the company to consult stakeholders who may be affected by the Net Zero Transition Plan. This typically will include consultations with staff members, trade unions, supply chain companies, customers, and sector or trade associations. It

Key	Term	Definition
		usually also includes consultations with planning and regulatory bodies and local communities over proposed changes to company operations.
C5	Circularity & Sustainability	This section normally sets outs the co-benefits of the net zero transition, in terms of the opportunity to adopt a more circular business model, that reduces the need for raw materials and the creation of waste streams by extending product lifetimes, digitisation of paper-based processes etc. It will also outline the opportunities to redesign processes, products and services to be more sustainable and to minimise environmental impact.
C6	Comprehensive Disclosures	A comprehensive disclosure policy means that companies will not only disclose emissions that fall within their boundaries of responsibility, but also those that are outside of their operational control, including impact of their business activities, products and services in inducing emissions in the wider economy and society, historically, today and in the future. This may be done qualitatively where impact cannot be quantified.
T1	Longer Term Trajectory & Target	This section outlines the annual rate that emissions will be reduced after the interim milestones to reach net zero by a given target date. Ideally it would also include an analysis of the potential constraints and barriers to meeting this target and an assessment of the risk to on-time delivery.
T2	Tactical Approach (Action Plan)	This section outlines the order in which different types of mitigation measure will be implemented, usually in the form of an action plan that prioritises measures that reduce emissions, followed by measures that substitute high emission products for low emission versions, and lastly measures that are designed to offset the remaining residual emissions.
T3	Technology Pathways / Roadmap	This section outlines the steps that the company will take to reach net zero in terms of the technical measures that will be implemented. Example of technical measures include installing solar PV panels, shifting to electric vehicles, and replacing boilers with heat pumps. Ideally this section would include the results of a scenario analysis of potential alternative pathways, including for example, the options of electrification of heat verse the use of hydrogen or biomass, and the impact of high levels of business digitisation verses business as usual.
T4	Target Operating Model	The Target Operating Model presents a vision of how the company will operate with after the transition and create value for shareholders. It should outline the business model and ideally set out key capabilities and business processes, organisational structure, key supply chain linkages, critical technologies, and investment and revenue model.
T5	Interim Targets & Milestones	This section outlines short- and medium-term targets for the absolute or percentage reduction of emissions and sets dates for completion. The first interim target is usually set at 5 to 10 years after the base year, and a second target may also be set at 10 to 20 years after the base year.
T6	Triangulation & Alignment	This section outlines how the company will ensure that its rate of emission reduction is aligned with national and sector pathways and compared with emissions reductions reported by close competitors. This process may be also undertaken with the assistance of third-party organisations who facilitate benchmarking between different companies and provide advice on current trends in mitigation measure adoption.
I1	Investment plans	This section outlines how mitigation measures will be funded by the company, either by a ring-fenced capital allocation, or by adjusting the company's capital project selection criteria to prioritise investment. This may include funding in emission reduction projects with longer paybacks that normally accepted, factoring in the rising cost of energy into life-cycle cost benefit analyses, or using internal carbon pricing to fund co-fund

Key	Term	Definition
		projects and increase the number of emissions reduction projects. Normally, it would also include summary data on project approvals.
I2	Risk Management	This section outlines how the company will manage the risks involved in implementing emissions reduction projects, including cost and time overruns, impacts on production or service levels, technology under performance, skills shortages, issues around customer acceptance etc. The risks considered can depend on sector. location and type and size of project, so only a broad outline by class of risk is expected here.
I3	Executive Incentives	This section sets out how executives will be incentive to implement emission reduction projects, particularly where the management culture tends to reward based on short term added value rather than longer term improvements in performance. Normally incentives will be defined in terms of bonuses for achieving and exceeding annual and long-term emission reduction targets, and consequences for not achieving targets. They may also include performance recognition awards for other staff.
I4	Supply Chain Initiatives	This section outlines the initiatives that the company is planning to take to reduce scope 3 (supply chain) emissions, which may involve offering training or incentives to suppliers for emissions reductions or including performance clauses in contracts with suppliers. Supply chain initiatives can be collaborative, co-operative or coercive in nature (WBCSD, 2022).
I5	Innovation Projects	This section outlines investment in innovation and research projects that aim to prepare new technology solutions for commercial deployment, and to change the business model to enable faster emission reductions. This could include for example investment in the development of new products and services, trailing new ways of working, market testing of carbon labelling to assist customers to change buying behaviours or supply chain studies to identify potential emissions reductions etc.
I6	Information Technology	This section outlines how the company's IT systems will be upgraded to enable knowledge sharing and cooperative working, the communication of emission performance and sustainability data inside and outside the company, the digitisation of business activities, products and services, and the real time measurement, monitoring & control of performance. Ideally it should consider the scope for using Artificial Intelligence, for example, in the automatic analysis of faults and performance gaps.
O1	Performance Review Process	The section outlines how often the performance of the plan will be reviewed, including which sections would be updated annually or every 2-3 years, and which would be reviewed only after a significant change to the company's business model, structure or financial performance. Ideally this section would also outline the criteria for triggering a review of the long-term strategy, technology roadmap or investment criteria, based on a regular review of a specific key performance indicators.
O2	Key Performance Indicators (KPI)	This section defines the 5 or 6 key performance indicators (KPIs) that will be used to assess progress against target in terms of emissions reductions achieved and planned, preparation of new technological solutions, increased sustainability, and increase corporate value. Ideally these KPIS should be linked to the metrics defined in earlier sections and summarise the overall outcomes of the emission reduction strategy.
O3	Carbon Offsetting & Insetting Principles	This section outlines the company's policies in respect of carbon offsetting, including how and when offsetting they will be used to achieve carbon neutrality, and the process for validating the offsets. Where a company decides to offset its direct emissions, by investing in emissions reduction in own supply chain, it should how the success of this "insetting"

Key	Term	Definition
		process has been monitored and verified, and the period over which offsets will be counted towards emission reduction targets
O4	Outsourcing & Offshoring Policies	This section outlines the company's policies in respect of outsourcing and offshoring carbon intensive parts of the business in order to be able to report reductions in direct emissions, without investing in physical mitigation measures. Ideally this section will also set out how incoming and outgoing business transfers are handled when reporting emissions reductions, so that any "emission intensity dilution effect" resulting from asset transfers is explained and not counted as an emissions reduction.
O5	Options Appraisal (Life cycle analysis)	This section outlines the companies approach to assessment of the costs and benefits of different technical pathways and projects, including details of what costs and benefits have been factored into the life cycle analysis (LCA). Ideally it would explain the company's project selection criteria with reference to payback periods, financial hurdle or discount rates, minimum internal rate of return and major project scheduling slots, in a manner that provides confidence that its plans can be delivered.
O6	Outreach & Training	This section outlines how the company is sharing its knowledge and experience in emissions reduction technologies with its local community and help to train up the next generation of co-workers both to meet its own needs for skilled staff, but also those of its supply chain companies. This section could also include details of the actions the company is taking to address constraints and barriers to faster emissions reduction.
NS1	New Structures	This section should outline planned changes to organisational structures aimed at enabling emissions reduction, including measures to enable oversight of emissions reduction programmes and knowledge sharing. Changes to the offices and industrial processes can be included here.
NS2	New Strategies	This section should outline planned changes to the business strategies adopted by the company in so far as they relate to emissions reduction, including for example, the inclusion of emission reduction targets into employee training and agreements with supplies, increased marketing of digital products and a lower-carbon footprint options, and strategies to enable increase remote working to enable reductions in office space.
NS3	New Systems	This section should outline planned changes to the system of rules, practices, and processes through which the company's operations are directed and controlled, in so far as they relate to emissions reduction. For example, this may include changes to ordering & logistics systems materials procurement systems, management information systems, process & building control systems, and carbon accounting systems.
NS4	New Skills	This section should outline plans to develop the emission reduction capabilities of the company's staff and management. This may also include plans to help staff to adopt low carbon lifestyles, as well as providing training in net zero business operation and management.
NS5	New Staff	This section should outline plans to recruit staff with the skills needed to transform the company's business model and to increase the capacity of engineering teams to deliver emissions reduction plans
NS6	New Style	This section should outline plans to change of the company culture to enable the proactive involvement of staff in remission reduction plans and plans to provide open and transparent access to data. It should also provide details of partnerships with suppliers & local communities. This section may also include plans for consultation with investors.

Annex 8 Comparison of our proposed net zero transition plan structure with that recommended by other authors

The Table below provides a mapping between our proposed net zero transition plan structure and that recommended by other authors. The mapping is RAG rated according to the degree of alignment between proposed structures. A blank square indicates no alignment. The text in the cell indicates the section where the contents were located. We have also indicated where the subject has been covered in one-line, in bullet points or is implied by the nature of the content or in the examples of actions that companies, or sectors can take.

Degree of Alignment	
Low	
Medium	
High	

Element	TCFD	CIFF	CSLN	IIGCC	CDP	IFRS	SG
High Level Investment Case	Strategy	One-line	Bullet points	Capital Allocation	Financial Planning	Strategy	Example
Long-term Strategic Plan	Strategy	Targets	Bullet points	Targets & Strategy	Targets	Strategy	Vision
Medium-term Delivery Plan	Strategy	Targets	Bullet points	Targets & Strategy	Initiatives & Targets	Strategy	Implied
Short-term Action Plan	Strategy	Targets	Bullet points	Targets & Strategy	Initiatives & Targets	Strategy	Key Elements
M&E Plan	Governance	One-line	Bullet points	External assessment	Accounting & Verification	Governance	Monitoring & Reporting
Change Management Plan	Governance		Bullet points	. Just Transition	Governance	Governance	Implied
Transparency & IT Plan	Governance	One-line	Bullet points	One-line	Accounting & Verification	Implied	Implied
Optional Extensions							
Executive Forward	Implied			Implied	Governance	Implied	Example
Contextual Analysis	Risk Man.	Examples		Examples	Scenario Analysis	Strategy	Key elements
Technical Methodology	Metrics & Targets	Examples		TCFD Disclosure	Accounting & Verification	Metrics & Targets	
Constraints & Barriers	Risk Man.	Examples		TCFD Disclosure	Risks & Opportunities	Risk Man.	One Line
Authorised Indicators	Metrics & Targets					Metrics & Targets	Published separately

Key to sources:

Abbreviation	Author	Reference
TCFD	Task Force on Climate Finance Disclosures	TFCD, 2021a & b
CIFF	Children's Investment Fund Foundation	CIFF, 2021
CSLN	The Climate Safe Lending Network	CSLN, 2021
IIGCC	Institutional Investors Group on Climate Change	IIGCC, 2021a & c
CDP	The Carbon Disclosure Project	CDP. 2021 & 2022
IFRS	International Financial Reporting Standards	IFRS, 2021
SG	Scottish Government	SG, 2021

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