COMPASSI

COMPASS FOR SUSTAINABLE FINANCE

TOWARDS A HOLISTIC METHODOLOGICAL FRAMEWORK TO QUANTIFY SUSTAINABILITY IN FINANCIAL INSTITUTIONS

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Disclaimer

This paper contains recommendations for the development of a holistic approach to assess sustainability in financial institutions. Many of the recommendations and approaches presented in the paper already constitute part of the methodology developed and applied by Compassi. The development of such methodology has been made possible through the work of the author with the Danish Investment Fund for Developing Countries (IFU) and the Danish Export Credit Facility (EKF), both under the UNEP Copenhagen Climate Centre (earlier UNEP DTU Partnership) and independently as Compassi.

The contents of this document reflect Compassi's own views and do not necessarily represent the views of other institutions and collaborators.

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PREFACE BY THE AUTHOR

It has been five years since, while working at the UNEP-DTU Partnership, I was asked if I wanted to join a project to help the Danish Investment Fund for Developing Countries (IFU) write their first Climate Policy. I knew nothing about investments. I just knew that I did not like the word "investment", as a principle. But people in the office had heard that I could do some stuff with emission factors (aka LCA), and there I was, after a few months, doing carbon footprints for a financial institution.

Working with IFU, and later with the Danish Export Credit Facility (EKF), during these years, changed my mind about the financial sector and gave me hope. The people that I have met, all the way to the top management, are serious about their climate commitment (at times even more than me!), and truly engage in the sustainability mission.

I now see how the financial system, even though flawed, has been instrumental in improving the world (even though, yes, it did not create a paradise). I believe it can now help us transform society toward a sustainable one. But a lot must be done.

From the point of view of methodology developer and sustainability analyst, I find this task extremely challenging. On the one hand, you have assessments that are normally very time-consuming and difficult to interpret. On the other hand, you have an industry that moves at light speed. The gap is big. Bridging that distance requires a good balance between pragmatism and methodological robustness. Yet, walking this balance is very much what is needed if we want to seriously direct important financial resources to projects that are truly in Our interest.

This report is an attempt to translate what I have learned over these years into a proposal for an improved quantification-based methodological framework for the financial sector. I hope this can inspire others and find interested readers to further develop this approach and put it into practice on a larger scale.

CONTENTS

1. OBJECTIVE OF THE PAPER

Finance is instrumental in creating the world of tomorrow. If we want to develop a society that thrives in harmony with the rest of nature, every bit of capital deployed should ideally be thought so that it does not create unnecessary additional burden on the biosphere, while contributing towards satisfying social needs. A substantial landscape of regulations and standards has emerged to try directing financial flows into just about the right type of development. Yet, translating into practice such initiatives, poses some technical and methodological challenges for the ones that have to produce the metrics required to assess if finance is (truly) sustainable.

Such technical and methodological challenges include, for example:

- Striking the right balance between the preciseness and time-efficiency of the assessments;
- Capturing both the impacts that materialize in "real-time" during the tenure of an asset (e.g., to report on the annual portfolio carbon footprint), as well as impacts that potentially arise after the tenure, in the remaining "life-cycle" of a project;
- Understanding both the absolute (i.e., attributional) impacts that materialize within the physical boundaries of a project (e.g., absolute GHG emissions and removals) and its consequential (i.e., marginal) effects (e.g., GHG emission reductions);
- Looking beyond the carbon-tunnel vision, to ensure a holistic coverage of environmental and social impacts;
- Moving from a relative sustainability framework (A better/worse than B) to an absolute one (A good/not-good enough).

All the challenges listed above reflect discussions that Compassi has seen arising from its work with financial institutions, and therefore represent some of the actual methodological challenges that the financial sector is facing right now. Such issues are very technical in their nature. Also due to this reason, they are still largely unknown or considered trivial, and, as a result of that, mostly overlooked in the financial sector. However, addressing these technical challenges is key to support finance in delivering on their sustainability objectives.

With such technical and methodological challenges in mind, the objective of this paper is therefore to dive further into such challenges and outline some items that should be part of any holistic framework for assessing sustainability impacts in financial institutions. Hereby the paper introduces the name "Compass for Sustainable Finance" (referred to as the "Compass") to indicate the framework that should arise from the recommendations outlined in the following chapters.

The methodological features that should be part of this Compass are only superficially addressed in this paper, which does not aim to be a self-standing, fully-developed, methodology. Some of the items mentioned still need to be developed, and in this sense the aim of this paper is simply to acknowledge such challenges and point to the need to address them. However, other features presented below are already fully or partially covered in the approach developed and used by Compassi with financial institutions.

One of the items presented, which has the potential to work in support of a truly transformative financial sector, is the introduction of assessments that make use of the Doughnut Economics model. The Doughnut Economics (from here on, the "Doughnut") is a visual framework for sustainable development introduced by Kare Raworth[1] to depict the ideal sustainable economy as one that meets social needs without overshooting the environmental ceiling[i] (Figure 1). By using the Planetary Boundaries[2] to assess what is environmentally sustainable and social thresholds (e.g., based on the Sustainable Development Goals) to measure what is socially sustainable, this is an example of an absolute framework for sustainability, which can be used to define if something is or is not sustainable (as opposed to a relative framework that can simply tell if option A is better than B). The paper will explore why and how this framework should be adopted by financial institutions.

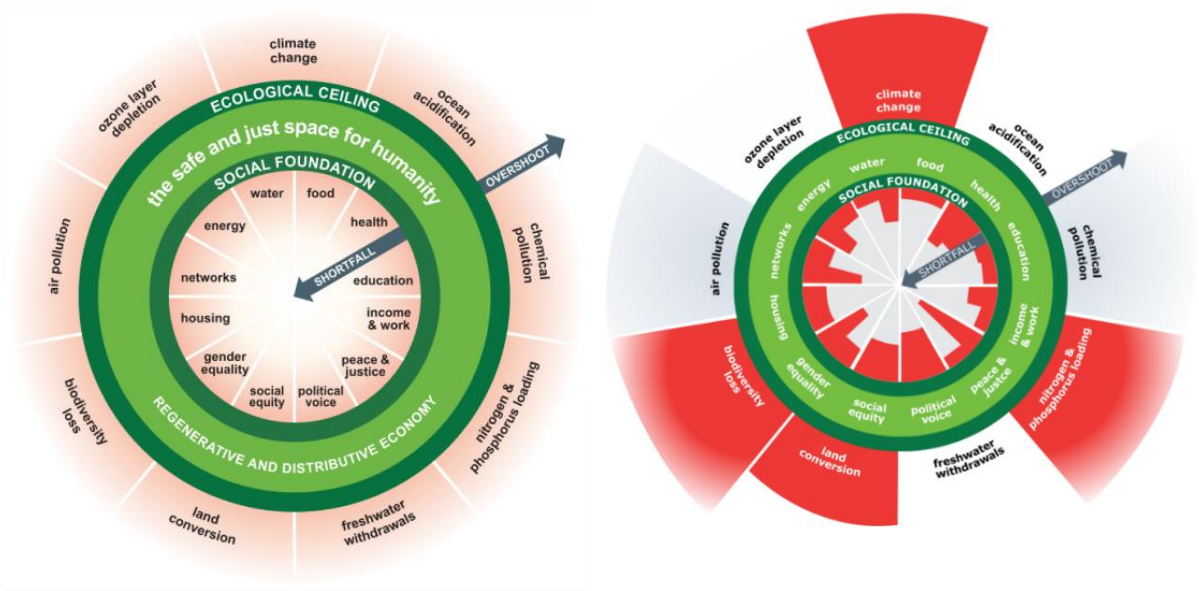

Figure 1. The doughnut economics model in its raw form, on the left[3], and displaying an assessment of the current global sustainability state (2017), on the right[4].

[i] The doughnut is delimited by two rings. The inner ring is the social foundation, which represents the basic needs for any human being that must be satisfied. If these are not met, then the result is poverty and need. The outer ring is the ecological ceiling, which represents environmental degradation. If this is crossed, the result is overconsumption and environmental unsustainability. Social and environmental sustainability is achieved when society is able to satisfy the needs outlined in the inner ring without overshooting the boundaries of the outer ring (i.e., when it stays within the doughnut).

A few more detailed remarks on the scope of the paper, before presenting the outline. First, throughout the paper, the assessment of climate change in terms of GHG emissions often takes a central role. This should not give the impression that the author is in favour of adopting a climate-first or climate-only approach. It is absolutely necessary to go beyond the "carbon tunnel vision". Assessments of GHG emissions can however be used as a starting point, because this is where most regulatory initiatives are focusing on, and due to the pressing and central character of the issue (with links to other environmental categories). As the remainder of the paper will explore, there are potentially a lot of yet underdeveloped elements that financial institutions should start including in their assessments. Therefore, to have a more gradual approach to the complexity of the issue, climate change mitigation can be used as a first "pilot" category, from where a more holistic methodological framework encompassing the full spectrum of environmental and social impacts can be developed. Second remark, the paper focuses on financial institutions and their assets. Assets can be companies, projects, real estate, mortgages, motor vehicles loans, bonds, guarantees, insurance, etc., hereby referred as "assets". The methodological framework depicted is therefore more specific for financial institutions, but its features can be relevant also for sustainability assessments of companies and projects.

The remainder of the paper is structured as follows. After this first introductory section, the second chapter outlines more in detail the sustainability challenge; then, in the third chapter, reflections on the role of finance in solving this challenge are presented. The fourth chapter dives into the theoretical framework (i.e. the landscape of initiatives, regulations, standards, etc.), which sets the rules of the game that the Compass should take into account. Then, in chapter five, the main items of the methodological framework of the Compass are presented. Finally, in the conclusion section, the status of the development of these items in the methodology used by Compassi is presented, outlining the need for further work.

2. THE SUSTAINABILITY CHALLENGE

As evolution continues its relentless journey, consequences of humans' exponential growth are becoming visible all over planet Earth. The mode of development that has brought prosperity in large areas of the world over the last couple of centuries is now facing its limits. Multiple planetary boundaries have already been breached[2,6,7], destabilizing the state of equilibrium that has characterized the Earth's system in the last ten thousand years (Figure 2). The resulting environmental crisis, ramping climate change on top of all, is expected to likely lead to impacts such as increase in food and water scarcity, rising inequalities, poverty, displacement, and wars, affecting all humans and living beings[8]. Many of these effects can already be seen today[ii].

[ii] Observed changes reported in the IPCC 6th AR[8] include increased frequency and intensity of hot extremes on land and ocean, heavy precipitations, droughts, wildfires, tropical cyclones, as well as increased ocean acidification, sea level rise, and aggravated air pollution. These changes already lead to observed impacts such as increased heat-related human mortality, reduced food and water security especially in mid- and low latitude regions, losses in terrestrial and aquatic ecosystems as well as shifts in seasonal timing, increase occurrence of climate-related food-borne and water-borne diseases, and impacts on functioning of key infrastructure.

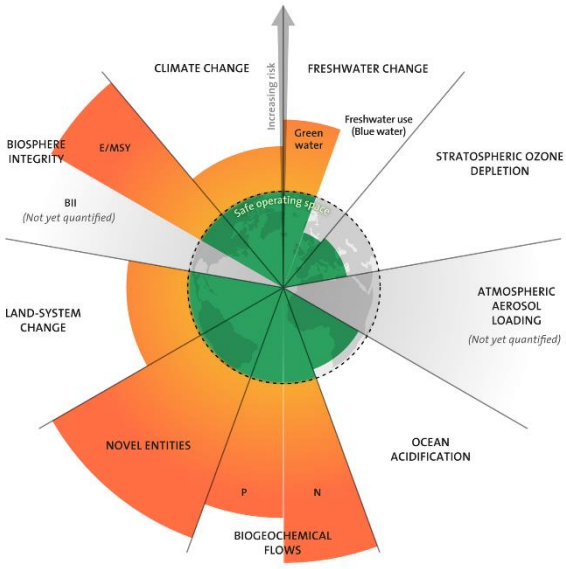

Figure 2. Latest assessment of planetary boundaries. Credit: "Azote for Stockholm Resilience Centre, based on analysis in Wang-Erlandsson et al 2022".

So far, and particularly starting from the mid-20th century, the acceleration in human progress has been made possible by overshooting planetary boundaries. Richest countries, which are performing better in terms of progress towards the Sustainable Development Goals (SDGs) and in their ability to meet human needs (and greeds), are also the ones with the largest ecological footprint. Based on the estimates of the Earth Overshoot Day[9], which measures how many Earth-equivalent resources are consumed in a year, in 2018, the USA required 5.1 Earths and Italy 2.7. On the other hand, Pakistan required 0.5. In the hope of achieving more happiness, and aided by a system where everything seems reachable, the richest act as if they can borrow planets from the future. At some point, Planet Earth asks for the bill and takes back everything, with interest.

Decoupling economic growth from environmental pressures under the promised green growth paradigm has so far yielded too little benefit. Technological progress alone is unlikely to be enough to help us stay within the Earth's boundaries, if the increase in consumption levels is not halted [10]. A more realistic strategy includes considerations such as degrowth, a steady-state economy, and transitioning to new modes of growth that put wellbeing at the centre. These alternatives make sense especially since it has been observed that after a certain point, increases in GDP do not lead to improved well-being[11]. Yet, it is unthinkable to talk about degrowth for the parts of the world that still have to meet basic human needs. Economic growth, and increasing consumption will still be a reality, at least for some time, and certainly for some parts of human society.

Humans will likely survive through the environmental crisis. The question is: at what societal and environmental cost? A rethinking of our values and goals is therefore needed, and urgently, if society is to make its evolutionary leap with the least consequences possible. This transformation must be reflected in

concrete actions that help humans across the world to meet their social needs while ensuring that we do not further overshoot, and instead slowly settle again within, planetary boundaries.

3. THE ROLE OF FINANCE

Finance has an important role to play in this regard. Through finance, we make it possible to take resources from Earth and transform them into something useful for our future, on a large scale. In that sense, finance, or how we have used the financial system so far, is part of the problem. It can also be part of the solution.

Capital must be directed towards activities that promote the transformation of society. Yet, most finance goes to promote the status-quo: of the 50 trillion USD invested globally in 2022 only 3.6 trillion (7%) went to investments that were labelled as sustainable investments[12] (and were they really sustainable?). An almost insignificant part, 0.13 trillion USD (0.2%) went to investments that were labelled as climate investments[iii]. Resources mostly still go to reinforce the consumeristic lifestyle and high-polluting industries which gain the most from the current system. As a result of this, the only thing that is sustained is the inequality of society and its environmental unsustainability.

The present system, including the financial system, was instrumental in getting us where we are. Now it must do more, to ensure the wellbeing of present and future generations. For that, there is a need (and growing trend) for finance to put society at the centre, and not for money to be a self-fuelling machine, with the only purpose of creating economic growth. After all, the financial system is Our tool, to organize the resources of our society in such a way that the world of tomorrow will facilitate our lives, not that it will make them impossible.

The disparities in living conditions across society call for different approaches according to the specific situation in which a project is implemented. What does not change is that a good approach must respect the environment and must help ensure that necessary societal needs are met. The collective financial system must be able to support that: promoting the fulfilment of social needs, while ensuring environmental stability, not in the interest of a group, but in the interest of all groups and species (and both present and future ones).

4. THE LANDSCAPE

To steer financial flows toward sustainability, various initiatives have risen in recent years. The summary below does not aim to be a complete mapping of the landscape. Since the objective of this paper is to propose a methodological framework to measure quantitatively sustainability impacts, this summary does not include

[iii] Estimations vary according to the methodology used. UNFCCC report shows more than 800 billion USD in climate finance in 2020[30]. Even if estimations vary, the conclusion that the amount of money spent on climate mitigation and adaptation is a very small share of the total investment volume still holds.

ESG ratings, which rather focus on assessing risks, and in more qualitative terms. Furthermore, initiatives and tools listed are primarily related to climate, and secondly to other environmental and social impacts. This is not because one (i.e., climate) is more important than others, but it is simply a reflection of the current sustainability priorities and actions in the industry.

The summary of the landscape is presented in Figure 3.

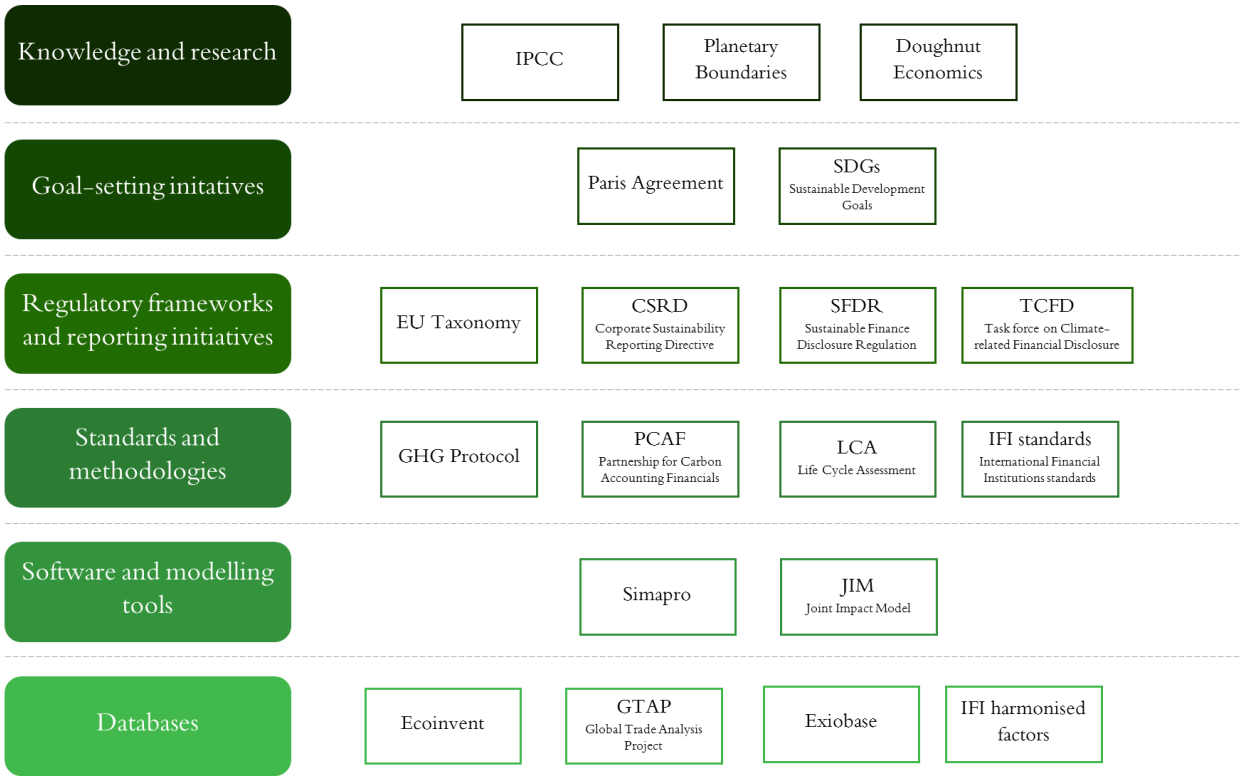

Figure 3. Sustainability initiatives relevant for the financial sector.

Knowledge and research are presented at the top of the figure, as all initiatives presented below in the figure are originally guided by what we know about the world (here represented as "knowledge and research"). Here we find IPCC reports with relevant climate change assessments, research on the environmental Planetary Boundaries, and Doughnut Economics.

As a result of this knowledge, goal-setting initiatives have been adopted. Above all, as "high-level" initiatives, the Paris agreement for climate change, which also includes a specific article on aligning financial flows with the Paris' goals. Looking at sustainability at large, we find the SDGs of the 2030 Agenda. Although not represented in the figure, in the area of goal-setting, we also find industry-lead initiatives such as net-zero coalitions (e.g., Net Zero Asset Owners Alliance, Net Zero Insurance Alliance, etc.), and the Science Based Targets initiative (SBTi).

Below these, in the figure, we have regulatory frameworks and reporting initiatives, which attempt to translate these goals into regulatory and/or reporting requirements. On the regulation side, the EU Taxonomy for sustainable activities includes criteria to evaluate if an activity and related investments are deemed sustainable, based on substantial contribution to one objective amongst climate change mitigation, adaptation, use and protection of water, transition to circular economy, pollution prevention and control, protection of biodiversity, and no significant harm to the other five. The EU Corporate Sustainability Reporting Directive (CSRD) outlines how companies should report on environmental and social impacts. The EU Sustainable Finance Disclosure Regulation (SFDR) has the goal of enhancing transparency in reporting on such impacts from the perspective of financial market participants. On the side of reporting initiatives, there is the Task Force on Climate-related Financial Disclosures (TCFD), which provides recommendations for effective climate-related disclosures in four areas; governance, strategy, risk management, and metrics & targets.

Methodologies and standards are needed to define how to provide the metrics demanded by the regulations in a harmonized way. Here we find the GHG Protocol[13], which is an internationally recognized greenhouse gas accounting and reporting standard for business, products, and policies. Linked with this, we have the Partnership for Carbon Accounting Financials (PCAF) standard[5], which builds on top of the GHG protocol to offer specific guidance for financial institutions, including on how to attribute emissions to financials. PCAF has now become a widely used standard in the financial sector to perform portfolio carbon footprint assessments. Born out of the work of international financial institutions (IFIs), is the IFI series of standards[14], which have been developed to harmonize the approach to project-level greenhouse gas (GHG) accounting, and especially to harmonize avoided emissions calculations for projects with clear climate mitigation benefits (e.g., renewable energy). Finally, we have Life Cycle Assessment (LCA), which is an ISO-standardized methodology to quantify environmental impacts taking into account the full life cycle of a product/system.

To calculate the numbers in alignment with these methodologies, software and tools may be used. Examples are Simapro, a life cycle assessment software, and the Joint Impact Model (JIM)[15], a tool for quantifying GHG emissions (among other impacts) of investments, which uses primarily financial data.

Finally, all this work would be much more time-consuming without the aid of databases. Databases for the quantification of environmental impacts are for example Ecoinvent, which is a library of processes expressed in physical volumes, and Exiobase or GTAP, which are economic-based input-output models, working with physical and/or monetary units. The IFI standards on their hand have produced the IFI harmonization factors for the calculation of avoided emissions from renewable energy and energy efficiency measures. Several other databases for quantification of social impacts exist, even though they are not included in this overview.

5. ELEMENTS OF A COMPASS FOR SUSTAINABLE FINANCE

In this jungle of standards and methodologies what is necessary is a compass that can produce the metrics needed to orient finance in the right direction. Below is a summary of the core items that such a Compass

should include. This section does not dive into the specific technical details, but offers an overview of the main aspects of the approach.

5.1. PURPOSE

The first objective of the compass must be that it enables financial institutions to deliver on the obligations set forth by current regulations and reporting initiatives. These are (but are not limited to), the EU Taxonomy, the SFDR, TCFD, etc. Basically, the compass should deliver the impact metrics that institutions have to produce. Below is a short overview of what sustainability-related impacts institutions would have to measure in accordance with regulations:

- EU Taxonomy: climate change mitigation (quantitative), adaptation to climate change, water and marine resources, resource use and the circular economy, pollution; biodiversity and ecosystems (all five most likely qualitative[iv])

- CSRD and SFDR: climate change mitigation (quantitative), adaptation to climate change, water and marine resources, resource use and the circular economy, pollution; biodiversity and ecosystems (all five mostly qualitative, but can be supported by quantitative data). With regard to social and human rights factors, impacts of interest relate to equal treatment and equal opportunities for all (including for example gender equality and diversity), working conditions (for example secure employment, working hours, and health and safety), and respect for human rights.

- TCFD: GHG emissions from scope 1-2-3. Other requirements related for example to transition risks are not covered in this paper.

The second objective is that the Compass, being a compass, must point finance in the right direction. The most important thing it should do is indeed to be able to answer the question "from a sustainability point of view, is this money well spent?". The goal chosen to translate this question into practice is that finance should help satisfying social needs without overshooting planetary boundaries. The Doughnut model can be used to characterize such north star. The Compass would therefore also include an assessment of whether a certain financial flow would help creating a society that lives within the Doughnut.

So, essentially, the Compass should help to measure especially and most precisely impacts on climate change mitigation, but also to map impacts on other environmental and social dimensions. This helps ensuring both the holistic view, which is needed to ensure we are going in the right direction, and the fulfilment of reporting requirements, which are more detailed for climate mitigation but also include other sustainability aspects.

[iv] Screening criteria for most of these categories still have to be released.

5.2. MOVING ALONG INVESTMENT STAGES

Financial transactions move along different stages before they are signed and enter the portfolio of an institution. At each stage information is collected. Insights get more precise as the transaction moves across stages. Sustainability assessments must follow this cycle and be appropriate for each stage. We do not want to overburden institutions and companies too hard too soon, but we want to ultimately have a good idea of what we have in our portfolio.

The following figure provides an overview of the different assessments deployed by the Compass at each stage. The four stages described in this section are just an example, and different institutions or financial products may have different stages.

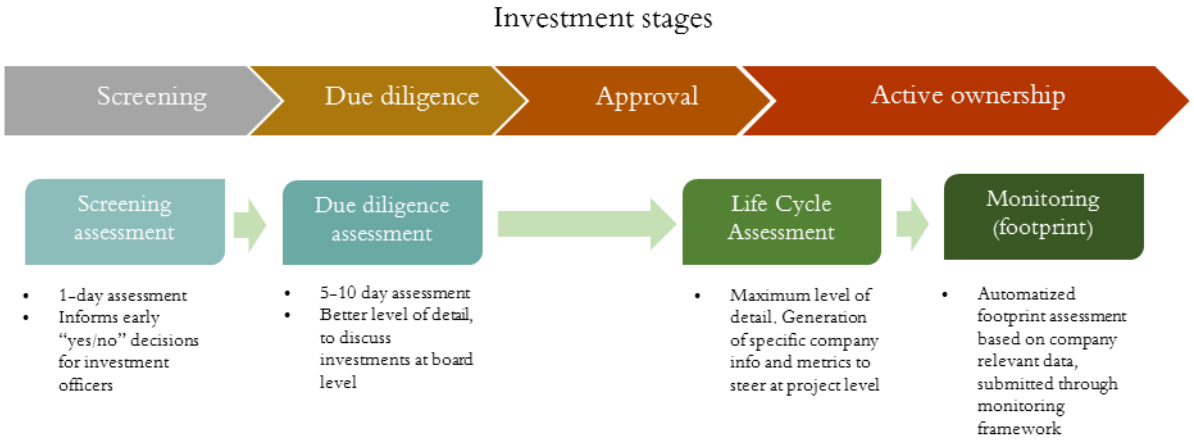

Figure 4. Different types of assessments during the investment cycle.

Screening assessments use financial data in combination with environmentally extended input-output databases, for example through JIM or Exiobase, to give a first estimation of the emissions, and screen if an investment is within or outside the defined focus of a financial institution. Databases like Ecoinvent can also be used in combination with physical activity data. Results can help spotting projects that have very concerning levels of emissions, and thus inform yes/no decisions or give a first indication of where to focus efforts during the next assessment. Screening assessments can focus on priority impacts, like GHG emissions. The time required for a screening assessment can be around 1-2 days.

The due diligence assessment, like the screening, is an ex-ante assessment, to be performed before a deal is signed. It provides a better level of detail into an asset's emissions. Simplified-LCA approaches like Life Cycle Check[16] can be used as inspiration. Results can be used to discuss the investment case at board level, identify mitigation actions for the project to implement over time, set targets, etc. The analysis can focus on priority impacts such as GHG emissions, but other impact categories, both environmental and social, could be added at this stage, especially for projects with high concerns. Here is where a Doughnut analysis could also be used.

Furthermore, a due diligence assessment would typically include an assessment of the expected avoided GHG emissions of the investment, and potentially other consequential impacts. The time required for a due diligence assessment could be around 5–10 days, according to the project and depending on how many impact categories are assessed.

After an investment is signed, especially if the project has high environmental concerns and the financial institution can have an active role in the asset, a full Life Cycle Assessment can be conducted (if the company/project has not yet conducted one independently). This can provide the maximum level of detail on the asset's sustainability profile and allow for the generation of specific asset info and metrics to help steer at asset level.

Finally, the annual collection of asset data can allow more or less automatized footprint assessment. This can include only GHG emissions, and therefore be carbon footprints, or include a broader environmental and social scope. Typically, consequential impacts such as avoided GHG emissions would also be monitored and reported.

PCAF is the main standard to be followed when it comes to carbon footprint and monitoring of impact. However, its framework can also be adapted to the other stages, complementing where necessary with other methodologies like GHG Protocol, LCA, or similar.

Throughout these stages, financial institutions may have to evaluate and report in alignment with regulations and such as SFDR, EU Taxonomy, CSRD, and initiatives such as TCFD. It is therefore important that the assessment deployed in each investment stage can deliver the metrics required by such regulations. These include not only metrics related to GHG emissions, but also other environmental and social impacts.

5.3. LIFE CYCLE THINKING

Life cycle thinking, intended as an approach that covers the full life cycle of a product or system, is essential to avoid shifts of impacts from one life cycle stage to another. The Compass therefore adopts a life cycle thinking. Inclusion or exclusion of processes can be reported using a typical system boundaries representation such as in Figure 5, possibly highlighting what type of data will be used to assess each of the processes, for example in line with the data classification and hierarchy outlined in PCAF[v].

[v] According to this hierarchy, for example, reported emissions is the preferred source of data. Then there is physical activity data, and below, economic activity data.

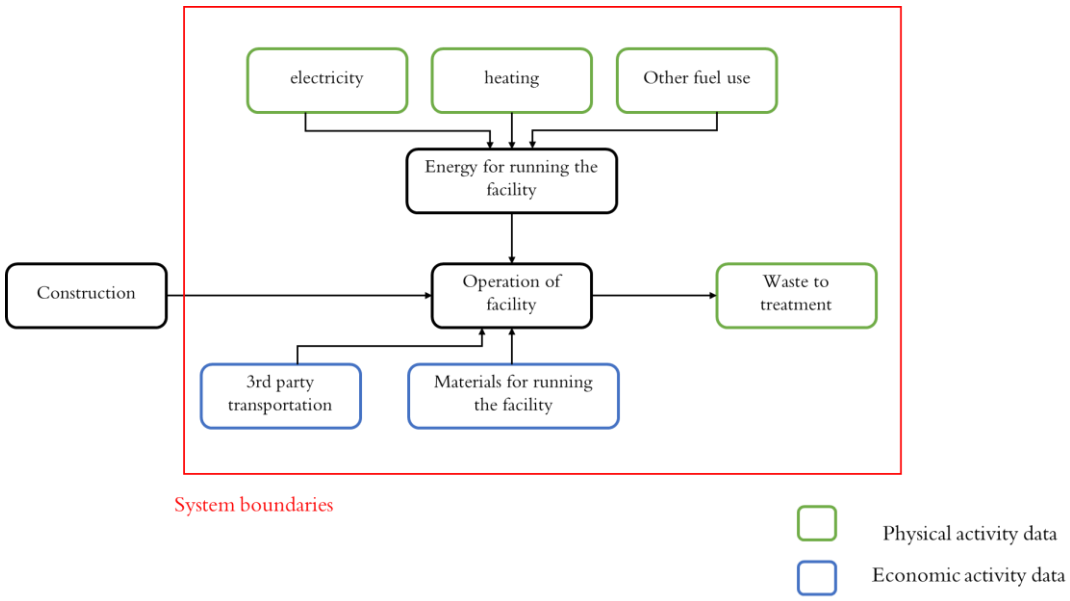

Figure 5. Representation of system boundaries and type of data used.

Since investments normally focus on projects or companies, the GHG Protocol terminology of Scope 1-2-3 is most often used, when assessing GHG emissions. Coverage should always include Scope 1 and 2, and also include Scope 3 whenever this is possible, especially when Scope 3 emissions are deemed relevant and significant. Furthermore, within Scope 3, emissions should be assessed as much as possible in the asset value chain.

Coverage can be reported using the Scope categories used by the GHG Protocol as in Figure 6.

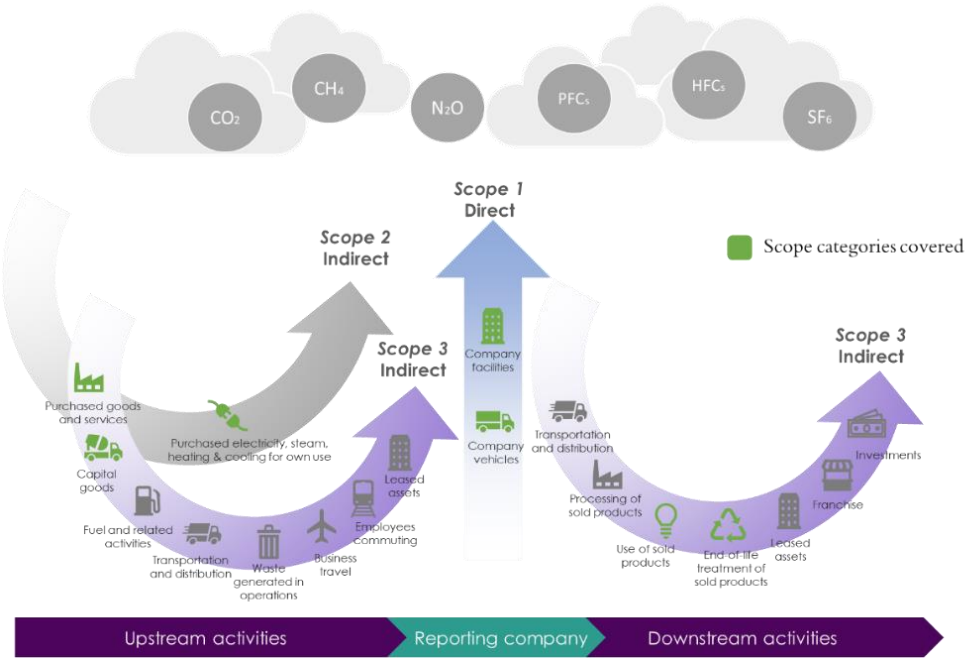

Figure 6. Example of reporting which Scope categories are included in an assessment (adapted from GHG Protocol[13]). Categories included are highlighted in green.

5.4. MULTIPLE TEMPORAL LENSES

Impacts connected to an investment can happen during or after an investment period[vi]. When calculating a portfolio footprint, according to PCAF and the GHG Protocol approach, a financial institution would be accountable for the emissions that are happening while an investment belongs to its portfolio, and emissions would reflect the activities of the asset in that specific reporting year[vii].

It follows that the footprint of greenfield renewable energy projects would be characterized by high emissions in the first years of engagement, due to Scope 3 emissions from the manufacturing of construction materials (see previous footnote), and none or very low emissions in the remaining operational lifetime. Similarly, investments in forestry projects involving sequestration would have low GHG removals in the beginning, while trees are small, and high removals later in the life of the trees. These facts weigh heavily and negatively

[vi] Technically, they can also happen before, but such Scope 3 impacts would be captured if GHG protocol guidance is followed (see next footnote).

[vii] Some scope 3 emissions occur simultaneously with the activity, but others may occur in previous years (e.g., manufacturing of materials used in construction) or in future years (e.g., use of products and waste treatment). In any of these cases, emissions should be understood as emissions that have occurred, or are expected to occur, as a result of activities that took place in the reporting year. For example, renewable energy projects have low or zero GHG emissions during the use stage (Scope 1 and 2 emissions) but have relevant construction and manufacturing emissions. These Scope 3 emissions are modelled in line with the approach outlined by the GHG Protocol, according to which, emissions from capital goods (e.g., emissions from production of solar panels) are classified as Scope 3 emissions and should be accounted in the year when those goods are purchased (i.e., when the construction of the project takes place).

in the carbon footprint of institutions engaged primarily in the development or early stages of a project. However, those are the institutions that are possibly contributing the most to climate mitigation, by developing these projects. To properly account for the medium/long-term mitigation benefits of these projects to the global community, it is important to consider the full lifespan of such projects. At the same time, the regulatory frameworks and standards require the institutions to perform a "stocktake" accounting. Ideally, financial institutions would do both. Therefore, the Compass should produce:

- A "real-time" footprint, in line with GHG Protocol and PCAF, which is essentially a stocktake of the emissions due to activities in that year. This aligns with reporting requirements and can be used for potentially claiming a net-zero portfolio at a certain point in time.

- A "life-cycle" footprint, which looks at emissions over the full life cycle since the entry of the investment and annualizes them by the lifetime of the project[viii]. For this purpose, ex-ante assessments can be used as the basis, and can potentially be re-written on a year-by-year basis as monitored data becomes available.

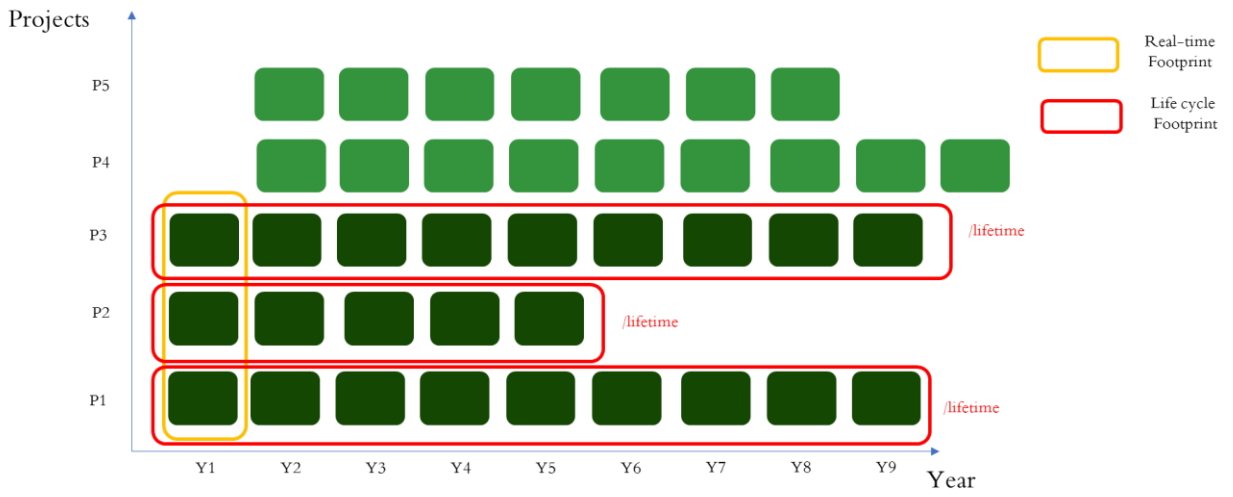

Figure 7. Multiple temporal lenses to analyse a financial portfolio.

The current standard way of approaching accounting in financial sector is by adopting the so called "real-time footprint". Sometimes institutions produce life-cycle metrics, such as the total avoided emissions over the project lifetime (beyond investment lifetime). However, this is done on ad-hoc basis, and such metrics are

[viii] This approach may be more relevant for project finance than corporate finance, and could be even applied only to forestry and renewables, or similar projects that are affected by a high variation in emissions across the life cycle.

sometimes being mixed up with real-time metrics. Life-cycle footprints should be introduced more systematically, and separately from the real-time footprints, to avoid such inconsistencies, which lead to unclear, biased, and incorrect results.

Ex-ante assessments such as due diligence assessments should always provide both of these complementary views when relevant (e.g., for project finance). Calculations should therefore include both total emissions over investment period and over project lifetime. Such results can then be annualised by the respective timeframe to derive the average annual emissions across investment period, and average annual emissions across project lifetime. Additionally, portfolio assessments should also have this double lens.

5.5. ATTRIBUTION AND CONSEQUENCES

In LCA, there are essentially two different modelling approaches: attributional and consequential modelling (Figure 8).

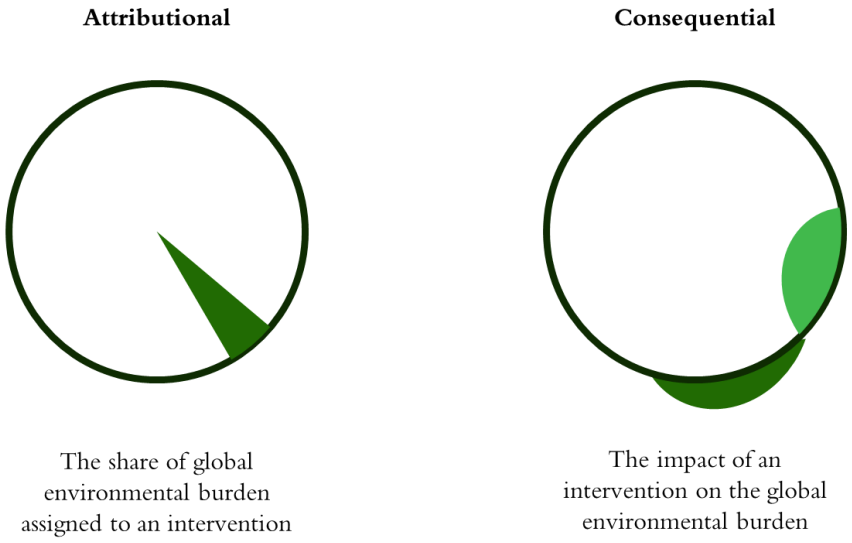

Figure 8. Illustration of attributional and consequential modelling approaches[18].

Attributional modelling aims to capture the inputs and output flows of all processes of a system as they occur, such as through the existing value chain. It is essentially a snapshot of how things stand assuming that they are static. This is the typical modelling approach used for accounting and reporting carbon footprints, and it is aligned with the GHG Protocol approach. Attributional methods are appropriate for allocating emissions to entities, which could in theory be summed up to derive total global emissions.

On the other hand, consequential modelling tries to model the systemic consequences of a decision or intervention. Such modelling would be able to capture for example, a decrease in emissions in the grid due to the substitution of coal energy by newly produced renewable energy.

To put it simplistically, one approach is for accounting, and one is for estimating impact. Results can, and most likely would, look very different according to which one of the two approaches is taken. While the attributional approach is useful for target setting such as net-zero targets and for monitoring performance (e.g., portfolio footprint) across time, the consequential approach is important to understand the consequences of interventions [17]. In some contexts, an apparently high-emitting investment could actually not be a bad investment at all, if its consequences for the broader system are extremely positive. The Compass should therefore deploy both approaches in parallel.

Simplified assessments of consequences, for example in terms of consequences on avoided emissions, can be performed, using guidance from existing frameworks, such as IFI harmonised approaches. However, such approaches are only able to capture consequences partially, as they typically focus on one specific life cycle stage of the project (e.g., operations), and only on one environmental metric (GHG emissions). Beyond an attempt of capturing avoided emissions, consequential modelling is not yet applied systematically in the financial sector. In some cases, consequential metrics are even used to calculate the carbon footprint of an institution, claiming (wrongly) alignment with, for example, PCAF, TCFD, SBTi, or similar. This cannot be done, since such initiatives ask to report on attributional effects. Another common old mistake (now luckily becoming less common) is mixing together the consequential and attributional approaches, for example by summing together absolute and avoided emissions to calculate one's carbon footprint. The risk, if such approaches are not applied appropriately, is that institutions end up reporting on carbon footprints that are inconsistent with regulations and not comparable with other institutions.

5.6. HOLISTIC COVERAGE AND ABSOLUTE SUSTAINABILITY

Even though the quantification of GHG emissions, may take a central role in the proposed framework, the purpose of the Compass is to guide institutions towards a transformation that ensures social prosperity within the planetary boundaries. It is therefore essential to go beyond the carbon tunnel vision. Furthermore, assessing other environmental and social impacts is necessary to evaluate compliance with regulations such as SFDR, CSRD, and EU Taxonomy. For a more holistic framework, the Compass choses the Doughnut Economy model as the north star. This not only enables a holistic impact coverage, but it also helps to move from relative to absolute sustainability. Compared to relative sustainability which focuses on answering the question of whether intervention A is better than B, absolute sustainability aims to answer the question "Is this good enough?"[19,20]. The use of planetary boundaries and social foundations enables to have absolute thresholds to answer this question.

Substantial work has been done to use LCA for quantifying the impact of products and systems on Planetary Boundaries[21–24]. The whole Doughnut, including both planetary boundaries and social foundation, is increasingly used in a variety of applications, such as at product level, city level, policy level, etc.[25,26]. It can also be used for investments.

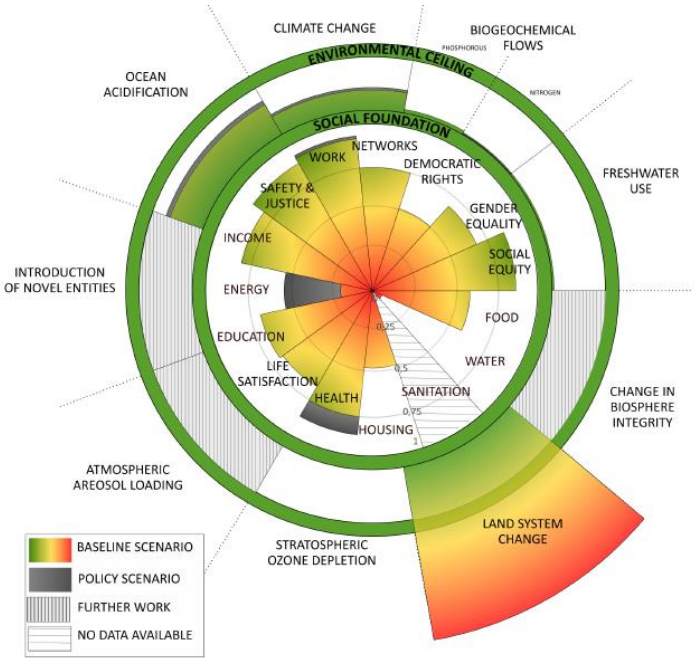

Figure 9. Impact of the safe of just operating space of a geothermal energy policy in Uganda. Figures from Desmoitier, Kolenda, et al.[25].

The Doughnut can be introduced during due diligence assessments, or earlier on, in a more qualitative way, in screening assessments. Consequential modelling could be used, to understand the expected impact of the investment intervention, ex-ante. Planetary boundaries and social foundation can be scaled down the country or state level, where the effects of the investment should be visible, using egalitarian approaches[ix].

Doughnut quantification can also be used for portfolio assessment, using in this case attributional modelling, and potentially scaling down boundaries using monetary volumes, although drawbacks of doing should be explored.

When assessing the Doughnut, an initial qualitative analysis can be conducted, to identify impacts that are expected to be significant and relevant (useful guidance on how assess qualitatively and prioritize impacts can be found in the literature[27,28]). Then a quantitative assessment can be conducted to assess more precisely the most important impacts[x].

[ix] There are at least three different principles to allocate the share of safe and just operating space (i.e., the doughnut) to an activity: egalitarian (equal per capita); grandfathering (proportional to current share of the total impacts); and ability to pay (proportional to economic activity). The paper is only tentatively proposing an egalitarian approach, but if this item of the Compass is to be developed further, the implications of using different principles should be considered.

[x] Taking also into account that some dimensions are inherently difficult to quantify (e.g., social dimensions).

One of the advantages of using the Doughnut framework is that it makes it possible to evaluate trade-offs (i.e., "burden-shift") between environmental and social impacts. This enables investment decisions that take into consideration context-specific sustainability priorities, such as the need to reduce environmental burden or to satisfy human needs.

The social foundation of the doughnut has been so far assessed using different frameworks. The use of dimensions based on Maslow's pyramid of needs is an example. Using SDGs, a more globally established sustainability framework to quantify the social foundation has also been done[29] and could be useful in this context.

The Doughnut can also be used to deliver robustly to current regulations. For example, there is still a lot of confusion regarding the methodologies required to produce SFDR metrics (e.g., Do Not Significant Harm metrics - DNSH). This leaves a gap that financial institutions have to fill with their own methodologies. The Doughnut can be deployed to show, for example, how DNSH principles are taken into account, and thus support reporting in compliance with the regulations mentioned in this paper.

5.7. IT AND DATA

Finally, the Compass must be supported by a digital infrastructure that manages the significant amount of data used and produced by assessments throughout the whole investment cycle, and across the portfolio. Assessments collect relevant parameters and produce project specific emission factors that also get more precise as projects and related assessments move along the investment cycle. A database will have the role of storing the emission factors and activity data from the assessments of the companies/projects. Then, a modelling tool can systematically harness the emissions of a portfolio's assets, stored via the assessments performed. By using activity data from the assets, it can generate updated raw-data overviews of the asset's emissions in an automatized way. Finally, a dashboard can act as the "front-end" of the tool, and the ultimate interface that presents the environmental impact at the asset level and portfolio level, The dashboard enables one to see an overview of the emissions and zoom in on the detail, therefore providing easy navigation to pinpointing hotspots and potential improvements.

Things may get even more interesting if such a framework can be used by various financial institutions and their assets, and sustainability-relevant data can be shared anonymously in agreement with companies and projects. This can feed a database of "impact factors" that are based on primary data from companies and projects. Such a database can then be used to generate more precise assessments than traditionally possible with current databases, therefore benefiting all the parties of the initiative, from financial institutions to companies.

6. CONCLUSION AND NEXT STEPS

The previous chapters have attempted to sketch a methodological framework that can be adopted to assess sustainability in the financial sector. Such an approach aims to:

1. Help financial institutions deliver the sustainability metrics demanded by current regulations such as SFDR, EU Taxonomy, CSRD, and initiatives such as TCFD.

2. Do so in a holistic way that promotes a truly transformational financial sector.

As explained in the introduction, some of the items of the "Compass" presented in this paper are already part of the methodology currently used by Compassi in its work with financial institutions. This means such features can be already implemented by financial institutions to improve current sustainability approaches. Some other items, however, are only partially developed and not yet applied consistently, and others are yet to be developed. The overview in Figure 10 shows the items of the Compass that are already fully developed and applied in Compassi's work (green), the items that are developed and not applied or only partially developed (yellow), and the items that are yet to be developed (red).

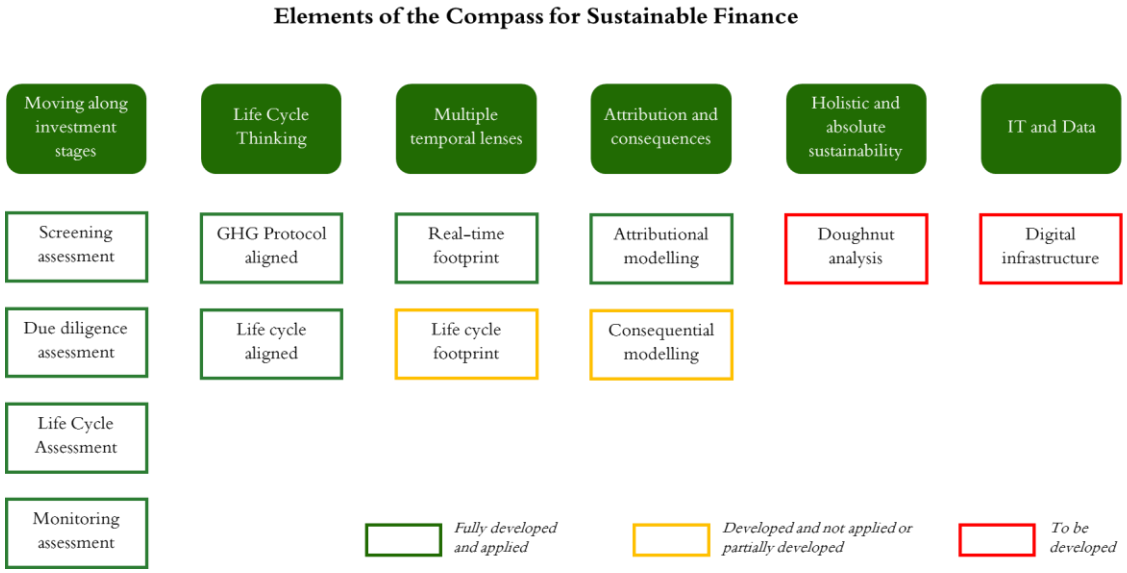

Figure 10. Overview of which items of the Compass are already developed and operational in Compassi's methodology, and which need further work.

Looking more into the details of the status of these features, and starting from the left of the figure, the mechanism of having assessments tailor-made to investment stages is already a well-oiled process that is part of Compassi's approach, as well as the Life Cycle thinking adapted to investments. Such considerations can therefore be easily replicated and applied more widely to strengthen current sustainability assessments.

Looking at the need to adopt the two complementary temporal lenses of "real-time footprint" and "life-cycle footprint", the current standard way of approaching accounting in the financial sector is by adopting the so called "real-time footprint". "Life-cycle" metrics are used on ad-hoc basis, and sometimes mixed up with real-time metrics. Life-cycle footprints should be introduced more systematically, and separately from the real-time footprints, to avoid such inconsistencies. It is furthermore important to understand how these metrics should be introduced in investment decisions and also clarify which of these metrics should be used for reporting (e.g., an institution should always report on what is here called real-time footprint according to regulations, while there is no requirement to produce an annual life-cycle footprint).

Similar considerations are applicable to the consequential vs attributional discussion. Consequential modelling is not yet applied systematically in the financial sector, and sometimes it is even (wrongly) used to calculate carbon footprints, or mixed with attributional approaches. This leads to institutions reporting on carbon footprints that are inconsistent with regulations and not comparable with other institutions. Again, the simple solution is to follow GHG Protocol and PCAF guidelines to calculate carbon footprints that are in alignment with TCFD, SBTi, net-zero commitment etc., and introduce in parallel the consequential impacts. Both numbers are essential to properly steer portfolios.

All of the above is relatively easy to implement, and would already significantly enhance consistency, clarity, and robustness in the way financial institutions assess sustainability and produce the metrics required by the regulations. What needs more work and can allow finance to make an important leap forward may be the introduction of an absolute sustainability approach. In this paper, this is translated into the idea of introducing a Doughnut analysis. The Doughnut offers an absolute framework, covering relevant environmental and social impacts, and putting them into the perspective of the Earth's carrying capacity and basic human needs. Levels of fulfilment of social needs and levels of environmental burdens are location-specific (the current fulfilment of social needs and the environmental impact of an average European citizen is different than the fulfilment and impacts of an average African citizen). Capturing that is essential to direct financial flows towards what is truly sustainable. The Doughnut can also be used to deliver robustly to current regulations such as SFDR. However, a Doughnut approach fit for investments has not yet been developed, and this paper has only introduced some considerations that could be taken into account. More work is needed in order to operationalize such an approach.

Finally, a good compass must facilitate orientation, not create more confusion. Therefore, building an IT and data management tool would be critical to organize all the metrics produced from the above-mentioned assessments. More important, it would be essential to support an initiative that goes beyond the single institution and helps the whole sector lifting the quality of their sustainability assessments, by allowing data-sharing horizontally and vertically. This is also an area that would need development to strengthen the approach depicted in this paper.

To conclude, by sharing these thoughts in the form of a potential framework, the author is seeking to find people willing to collaborate on developing further and putting into practice this methodological framework. Possible support and collaborators include foundations, financial institutions, organizations, companies, universities, independent consultants, etc. Two of the immediate tasks at hand would be to develop a methodology to implement Doughnut assessments in the financial sector, and to develop the digital infrastructure that can support the Compass. After that, a methodological paper where all the elements mentioned in this paper are brought together can be finalized. This can then become a reference document for the sector to 1) structure and deliver better metrics in alignment with current regulations and standards, and 2) move towards a more holistic and transformational sustainability framework. This can help in bridging the gap between the requirements of regulations and initiatives, and the status of sustainability assessments in the financial sector. Looking back at the landscape in Figure 3, the base of the pyramid must be solid, for its top to be as high as our ambitions are.

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