Green/Brown ratio: a zoom on the Energy Supply Ratio (ESR)

The Green Diet Financing Theory needs a robust metric

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Introduction

It is no coincidence that this issue is introduced as early as Article 2 of the Paris Agreement—effectively the first substantive article among the treaty's 28. Aligning global financial flows with the goal of limiting the rise in global temperature to well below 2°C above pre-industrial levels is a core requirement for achieving a low-carbon transition. This alignment necessarily involves mobilizing these financial flows, but also monitoring them—assessing their compatibility with such an ambitious climate objective.

To track the greening of global finance, a clear analytical methodology is key to account for both financial flows toward green activities and those still financing so-called brown activities, primarily fossil fuels. The recent strategic pivot of the Glasgow Financial Alliance for Net Zero (GFANZ)—while it may undermine the analytical robustness of decarbonization tracking—ultimately points in this direction by prioritizing financial targets over emissions-based goals. In the end, a growing consensus is emerging : it is not so much the sheer volume of trillions of dollars and euros committed to the green economy that matters most, but rather the ratio between green and brown finance. This "green-to-brown" ratio rests on a universal principle: just as a successful diet cannot be measured solely by the intake of healthy calories without accounting for unhealthy ones, tracking climate-aligned finance must capture both green and brown flows—and aim to shift the balance significantly.

In its *World Energy Investment 2024* report, the International Energy Agency (IEA) highlights that investments in clean energy technologies and infrastructure have exceeded $2 trillion. Yet the report makes it clear that this amount is only 1.8 times greater than investment in fossil fuels (IEA, 2024a). According to the IEA, this ratio must increase to 10-to-1 by 2030 under its Net Zero Emissions (NZE) by 2050 scenario (IEA, 2024b). This IEA work also demonstrates another key advantage of the green-to-brown indicator: like the implicit 1.5°C goal in the Net Zero pathway, it provides a quantifiable target—a crucial element for policymakers and financial institutions seeking to structure their financing strategies and set priorities. While the NZE scenario is now widely recognized as a benchmark by many financial actors, some stakeholders have nonetheless pointed out its limitations and are advocating for alternative approaches.

Fossil fuels remain the primary source of greenhouse gas (GHG) emissions globally, accounting for 85% of energy consumption in 2023 and contributing to over 73% of total CO_2 emissions. The ongoing expansion of fossil fuels has led to an increase in energy-related emissions, from 21.1 $GtCO_2$ in 1990 to 37.2 $GtCO_2$ in 2023 (IEA, 2024c). In this regard, the energy sector plays a pivotal role in the climate transition, requiring a rapid reallocation of funding to reverse this trend and reach a peak in global fossil emissions. Precise tracking of financial flows directed to this sector is therefore essential to assess the coherence of climate strategies. To this end, an indicator based on a binary approach, such as the green to brown ratio, which relies on a comparative approach between funding allocated to fossil fuels and that directed toward their alternatives, constitutes an essential analytical tool.

In this perspective, BloombergNEF (BNEF) introduced the Energy Supply Banking Ratio (ESBR), a first methodological base for comparing bank financing across different energy sources. However, this

indicator has several limitations that should be analyzed and addressed in order to ensure a more comprehensive and meaningful understanding of financing dynamics within the energy transition. This type of energy-sector-focused indicator, initially developed by data providers, is increasingly being adopted by financial institutions, particularly private banks, and is receiving growing recognition from regulators. This could be illustrated by its integration in the recommendations of the European Paris-Aligned Benchmarks (PAB), which establish a voluntary target for green reallocation through a "green to brown" ratio (TEG, 2019). More recently, the European Banking Authority (EBA) guidelines, published in January 2025, mentioned a ratio comparing financing directed toward low-carbon and fossil fuel energy supply as one of several indicators that should be monitored by banks for "backward- and forward-looking ESG risk metrics" (EBA, 2025).

While we encourage the development of more specific green to brown granular ratios (i.e. at sector level or capital market flow level) to enhance the evaluation of progress and effectiveness of climate action – this indicators family should be produced upon normalized methodological guidelines to ensure their reliability and comparability. This is particularly important for the design of the KPI to evaluate energy supply financing, also referred to as the Energy Supply Ratio (ESR). We explore here key issues involved in constructing this ratio: why focus on supply (Part 1)? How to define what is green, or sustainable, and what is not (Part 2)? Should it be oriented toward evaluating financial flows or stocks (Part 3)? The article also offers a critical analysis of existing tools, with a particular focus on the ESBR (Part 4), the indicator developed by BNEF, which remains a current reference. These elements contribute, in the final section (Part 5), to suggest improvements aimed at making the Energy Supply Ratio more relevant and effective.

This article is part of a series of works undertaken by the ILB (Institut Louis Bachelier), aiming to provide financial institutions, especially banks, as well as their stakeholders, with standardized, transparent, and comparable methodological and analytical frameworks. This ESR indicator should enable the assessment and comparison of banks' consistency and ambition in supporting the energy transition.

1. Approaches to energy assessment: Supply vs Demand

The analysis of financial flows in the context of the energy transition can be structured around two complementary analytical perspectives: energy supply and energy demand. While each approach addresses distinct aspects of the transition, they are fundamentally interdependent.

The supply-side perspective focuses on analyzing the allocation of financial resources to both fossil energy and its "sustainable" alternatives (see Section 2), including production, transportation, and storage of energy. It encompasses areas such as renewable energy generation, battery systems, and electricity grids. In contrast, the demand-side perspective examines financial flows related to energy efficiency and end-use sectors, such as buildings, transportation, and industry. This conceptual distinction, endorsed by institutions such as the IEA, reflects the two core dimensions of the energy transition: transforming how energy is supplied and how it is consumed.

This article concentrates on financial flows allocated to the energy supply sector, using the ESBR developed by BNEF as a starting point. The focus on supply-side financing is motivated by its greater conceptual clarity, in contrast with demand-side assessments, which are often fragmented and influenced by sector-specific dynamics and political considerations. By prioritizing the supply dimension, the article seeks to establish a more robust, broadly applicable, and widely accepted methodological framework.

An expanding body of literature has examined the alignment of financial flows with the climate objectives set by the Paris Agreement, particularly concerning energy supply financing. These studies

provide a valuable basis for further exploration. For instance, the IEA report *The Oil and Gas Industry in Net Zero Transitions* (2023) offers a clear differentiation between financing trajectories for energy supply and energy demand. According to the IEA, by 2030, every dollar invested annually in fossil fuels must be matched by ten dollars in the energy transition, including six dollars specifically directed toward low-carbon energy supply, mainly electricity generation, storage, and grid infrastructure. This estimate, which has also been referenced by financial center actors such as the French Sustainable Finance Institute (IFD, 2024), illustrates the increasing use of such indicators and targets to guide financial flows in support of the energy transition.

2. Defining what is "green" and what is not

Before conducting a comprehensive analysis of financial flows dedicated to the energy transition, it is essential to precisely define the scope of the ratio, namely what constitutes fossil energy (brown perimeter) and what may be considered as sustainable energy supply (green perimeter). Regarding the latter, this article deliberately avoids relying on commonly used terms such as "green" or "low carbon", whose definitions vary significantly among stakeholders and may, sometimes, include controversial or marginal technologies. The same applies to the concept of "clean energy" promoted by the IEA, which assumes that all low or zero-emission sources are inherently positive. However, this conceptual definition may overlook potential negative impacts that some technologies can have on ecosystems, biodiversity, human health, or human rights, nor does necessarily consider the complete lifecycle CO_2 emissions of these technologies, which could be assessed through a lifecycle assessment (LCA). Integrating "Do No Significant Harm" (DNSH)[1] and Minimum Safeguards[2] principles into this definitional framework seems to be a consensual approach to mitigate the risk of generating negative externalities that could undermine broader environmental or social goals, and it would further strengthen the legitimacy and credibility of the sustainable component of the ratio.

The diversity of conceptual frameworks underpinning these classifications poses a major challenge to comparability and hampers efforts to harmonize analyses aimed at assessing the effectiveness of financing for the energy transition. Clarification is therefore essential, particularly in a context characterized by a narrowing window for climate action constrained by a limited amount of financial resources. In this regard, it becomes imperative to identify the technologies that are demonstrably compatible with current climate timelines and to distinguish them from those likely to delay progress. Some climate solutions, while technologically promising, may not be scalable within the timeframe required to meet 2030 emission-reduction targets. Priority should thus be given to immediately deployable technologies aligned with the 1.5°C objective – such as solar and wind energy – along with the supporting infrastructure required for their integration, including electricity storage and grid modernization.

Once the definition of sustainable energy supply is established, it is equally important to delineate the fossil energy component included in the ratio. This brown perimeter encompasses the entire fossil energy value chain—coal, oil, and gas—from extraction and production to processing, transportation, distribution, and end use.

[1] DNSH (Do Not Significant Harm): means not supporting or carrying out economic activities that significantly undermine other environmental objectives.

[2] MS (Minimum Safeguards): refers to a set of social and governance criteria that economic activities must meet in order to be considered sustainable.

A forthcoming article will provide detailed guidelines to further specify both the sustainable and brown perimeters, drawing from existing classification systems to support greater alignment and consistency among financial market participants.

3. Stock vs. Flow approaches

In the assessment of financing dedicated to the two respective Green and Brown scopes, an additional methodological option can be employed: a stock-based approach, which analyzes the total exposure of financial institutions, and a flow-based approach, which focuses on new financing activities over the course of the year. A more precise estimation of flows appears legitimate, yet it faces a number of limitations.

The flow-based approach allows for the inclusion of a broader range of financial instruments, such as bonds, which are difficult to capture through a simple analysis of existing exposures. However, it raises comparability issues between balance-sheet ratios — which represent significant commitments for banks, particularly in terms of risk — and capital market activities, where the bank's balance sheet is only marginally, if at all, engaged, but which are more exposed to market volatility and uncertainties. Nonetheless, this methodology enables the inclusion of financing allocated through off-balance-sheet capital markets activities, providing a more dynamic and representative view of the efforts made by some banks to advance climate objectives and to deploy innovative financial engineering through dedicated instruments.

Developing specific ratios for bond-related activities and changes in financing stocks would also make sense, as it would allow for better aggregation into broader Green-to-Brown ratios, such as the Exposure to Sensitive Risks (ESR) ratio. This dynamic would support a more accurate assessment of the alignment of investments with a decarbonization trajectory consistent with the 1.5°C goal, as outlined by the IEA's Net Zero Emissions (NZE) scenario. Indeed, alongside its emissions trajectory, the NZE scenario also provides a "financing trajectory" for annual investment needs, offering a reference point to identify the new financial flows required to achieve the 1.5°C target.

4. BloombergNEF's ESBR review

4.1. Presentation of BloombergNEF's methodology

The concept of Energy Supply Ratio (ESR), and specifically its version proposed by BloombergNEF (BNEF) under the name Energy Supply Banking Ratio (ESBR), is an indicator developed to measure the contribution of financial institutions, particularly banks, to the energy transition. This BNEF indicator compares financing allocated to projects or companies involved in supplying so-called "clean" energy to that directed toward fossil energy.

The methodology employed by BNEF can be broken down into four main steps.

First, it identifies financial flows, referring to new annual financing allocated to the energy sector. Financial flows here include several components: equity, debt, project finance, and tax equity. The equity and debt segments encompass a range of financial instruments such as: IPOs, equity and bond issuances, syndicated loans, and labelled use-of-proceeds based sustainable debt.

Second, BNEF applies adjustment factors to the financing amounts, in proportion to the revenues generated by the "clean" and "fossil" activities of the recipient companies. To do so, BNEF uses its proprietary "Clean Energy Exposure Ratings (CEERs)" and "Fossil-Fuel Exposure Ratings (FFERs)" adjusters.

Third, the adjusted data are aggregated into two sets – "clean" and "fossil" – to produce a ratio. This ratio reflects the share of financing directed toward the solutions BNEF designates as "clean energy" compared to those allocated to fossil energy at a specific point in time.

Finally, the ESBR relies on a set of net-zero climate scenarios to evaluate the "target" of the previously constructed ratio, in terms of the financing needed to meet the objective of limiting global warming to 1.5°C. These scenarios are drawn, among others, from established and recognized institutions such as the IEA, the Intergovernmental Panel on Climate Change (IPCC), and the Network for Greening the Financial System (NGFS). According to BNEF's analysis (2022) of the selected scenarios, annual investments in low-carbon solutions must be at least four times higher than those in fossil energy, with the ratio ranging from 4.1:1 to 11.6:1 by 2030.

4.2. Critical analysis

The ESBR developed by BNEF presents several advantages, but also certain limitations that must be analyzed to understand its scope.

Advantages

One of the main strengths of the ESBR lies in its focus on financial flows, which provides a dynamic and updated view of banks' efforts in the energy transition by capturing emerging financing trends. Its broad coverage of financial products, including bonds, loans, and project finance, ensures a comprehensive view of bank financing.

Another major strength of the ESBR is its ability to encompass crucial sectors to the energy transition, beyond electricity generation. It includes key areas such as energy storage, power grids, and the manufacturing of strategic equipment and components (e.g. photovoltaic cells, wind turbine nacelles, and blades). This expanded coverage provides a more realistic reflection of the infrastructure and technology needs required to accelerate the energy transition.

Furthermore, the ESBR stands out for its binary approach, which highlights the reallocation of financing between fossil energies and sustainable alternatives. This methodology offers a clear view of financial flows and explicitly captures financing trends. Although transition assets[3] that do not fall strictly into one of these two categories are not included here, this approach improves the readability of financing dynamics and highlights efforts to redirect capital toward sustainable solutions.

Lastly, the ESBR distinguishes itself by its reliance on a set of robust climate scenarios to project the evolution of "clean" and fossil financing consistent with limiting temperature rise to 1.5°C. By incorporating various net-zero pathways developed by recognized organizations – each based on different decarbonization assumptions – this approach strengthens the relevance and consistency of the indicator in relation to climate objectives.

[3] While there is no consensual definition, a transition asset can be understood as an initially carbon-intensive asset committed to a trajectory of gradual emissions reduction. In this regard, the OECD (2022) points out that transition finance is generally understood, within the various approaches, as aiming to decarbonize economic entities or activities that: (i) have a high greenhouse gas (GHG) emissions intensity; (ii) do not yet have a low- or zero-emissions alternative that is economically viable or credible in all relevant contexts; (iii) play an essential role in future socio-economic development.

Limitations

The complexity of the revenue-based adjustment methods – namely CEER and FFER – can introduce uncertainties, especially when data are incomplete or missing. Furthermore, adjusting financing amounts based primarily on capital expenditures (capex) would more accurately reflect how funds are actually used by the recipient company, and thus offer a more realistic allocation method.

The data used to build the ESBR come from various sources, each employing different sector classification systems, such as Bloomberg Industry Classification Standard (BICS), Global Industry Classification Standard (GICS), NACE, NAICS, or TRBC. Urgewald (2024), one of the databases used by Bloomberg, for example, employs several of these classifications in its construction. This diversity can lead to comparability issues between different analytical frameworks, thereby limiting the consistency of evaluations when methodologies rely on varying nomenclatures.

A notable limitation of the ESBR relates to its "clean" perimeter, which includes technologies directly linked to fossil fuels, such as carbon capture and storage (CCS), hydrogen produced from fossil fuels, and bioenergy. As these technologies prolong dependence on fossil fuels[4], can have significant negative impacts on the climate and biodiversity, and do not always meet strict sustainability and long-term emissions reduction criteria, their exclusion from the "sustainable" perimeter of the ratio is essential to preserve the robustness of the indicator.

Although BNEF uses a set of climate scenarios to project a financing ratio target consistent with the 1.5°C objective, two main issues arise. The first concerns the perimeter of solutions considered "clean" by the ESBR: a significant share of scenarios rely heavily – or even excessively – on negative emissions technologies (NETs) to achieve carbon neutrality[5]. Integrating NETs into models allows scenarios to follow less stringent short-term emissions reduction pathways, as the future removal of CO_2 could theoretical extend the remaining carbon budget. Applying filters such as those used by the International Institute for Sustainable Development (IISD, 2022), which select net zero scenarios aligned with the IPCC's maximum sequestration potential for NETs, may offer a more robust approach. Since NET use postpones part of the decarbonization effort, prioritizing scenarios focused on the rapid deployment of sustainable technologies in the short term would yield a more accurate assessment of financing needs to meet energy transition objectives. The second issue is the outdated nature of some scenarios used by BNEF. Indeed, many are based on the carbon budget remaining as of 2020, as estimated by the IPCC's AR6 report (2023), which put the budget at 500 $GtCO_2$, a figure no longer consistent with the updated estimate of 200 $GtCO_2$ in 2024 (IGCC[6], 2024). A reassessment of the remaining carbon budget necessarily requires a reassessment of decarbonization pathways, and consequently, a revision of the financing projection for the 1.5°C objective. For example, in the IEA's updates to its NZE scenario between 2021 and 2023, the ESR ratio target for 2030 increased from 5:1 (2021) to 6:1 (2023).

[4] For example, as the World Resources Institute (WRI) points out in a brief on CCUS (Carbon Capture, Utilization and Storage) – a variant of CCS (Carbon Capture and Storage) – this type of technology has the potential to lock-in fossil energy production and other fossil fuel-dependent processes (WRI, 2023).

[5] According to Fuss & Al. (2016), most scenarios compatible with a 2°C temperature increase, and all those compatible with a 1.5°C increase, require large-scale carbon dioxide removal (CDR) using negative emissions technologies (NETs), defined here as any anthropogenic activity deliberately aimed at extracting CO2 from the atmosphere.

[6] The Indicators of Global Climate Change (IGCC) initiative seeks to bridge the information gap between IPCC assessment cycles by providing annual updates on key climate indicators. This international collaboration involves a wide range of contributors, including many authors of the IPCC AR6 report and previous reports. The IGCC provides annual updates on key climate indicators, building on those highlighted in the most recent IPCC report cycle (IGCC).

Another weakness of the ESBR is its lack of direct connection with actual impacts in terms of emissions reduction or measurable climate progress. The indicator focuses on financial flows without directly assessing the concrete outcomes of the investments made. Since banks set absolute emissions reduction targets with widely varying scopes, it would be especially relevant to link the ESR with emissions indicators to enable a more comprehensive and coherent assessment of progress.

5. Our proposals for a more robust and effective ESR

Building on the methodology developed by BNEF for the construction of its ESBR ratio, we propose a series of methodological improvements to establish a robust, comprehensive and transparent Energy Supply Ratio (ESR) focused on energy supply financing.

Establishing a common reference framework and clarifying the definition of the sustainable energy supply perimeter

To develop a consensus-based approach, it is essential to clearly define which energy sources qualify as sustainable (green perimeter) and which as fossil-based (brown perimeter), drawing from established reference frameworks. This definition must be rigorous to avoid the inclusion of activities that, although sometimes labelled as "clean," do not guarantee a genuinely sustainable transition. For example, certain technologies such as bioenergy or carbon capture and storage (CCS) remain controversial due to their overall environmental impact or their insufficient maturity in the short term.

The objective is to establish a clear and harmonized perimeter that ensures comparability of analyses and prevents misinterpretation of financial commitments. By integrating robust and commonly accepted criteria, it becomes possible to construct a reliable and representative ESR that reflects actual efforts in support of the energy transition.

Clarifying the perimeter associated with activities

An effective evaluation of financial flows linked to energy supply necessitates a comprehensive definition that incorporates the entire value chain. On the fossil side, this means including all stages of the value chain, such as exploration, refining, distribution, and end uses, to fully capture the extent of fossil-related financing. On the sustainable side, the perimeter must likewise cover the full value chain, not only energy production but also the related infrastructure such as transmission and distribution networks, storage systems, and components and equipment required for the deployment of electricity-based solutions.

Progressive integration of DNSH criteria and exclusions

Enriching the ESR framework with DNSH criteria – through a phased implementation – would enhance the environmental and social integrity of sustainable financing by ensuring that financed activities do not generate adverse externalities. As a first step, the focus could be on establishing an initial ratio that captures solely the allocation of financial flows between sustainable and fossil activities. This could then be complemented by a second, more comprehensive ratio integrating DNSH filters, thereby improving the sustainability assessment of financed activities and, in turn, contributing to a more robust and clearly defined scope of sustainable activities (green perimeter) within the ratio. In this context, the financing of a company producing photovoltaic cells should not only support the energy transition, but also minimize disruptions to sensitive ecosystems and comply with strict environmental standards to reduce pollution and water consumption linked to their production.

Adding a real-world impact lens to assess emissions reduction or contribution
To strengthen the climate relevance of the ESR, it would be beneficial to link the indicator to real-world impact metrics, such as installed capacity volumes or the proportion of financing directed toward emerging and developing economies (EMDEs). Incorporating such a dimension would allow for a more concrete assessment of the actual contribution of financial flows to the global energy transition. Moreover, to ensure a comprehensive understanding of the implications of these financial flows, it would be relevant to track the emissions associated with fossil-related financing. This dual perspective would not only support the assessment of emissions reductions achieved through financing sustainable activities, but also enable the monitoring of emissions evolution resulting from the continuation or expansion of fossil activities.

Analyzing "financing corridors" and developing robust scenarios for financial flow analysis
The use of a diverse set of models and scenarios, as employed by BNEF, is valuable for exploring multiple pathways toward a 1.5°C-aligned transition. Similar to emissions corridors, which delineate a set of permissible emissions trajectories under specific system constraints, the concept of "financing corridors" could be introduced. These would represent a range of plausible financing trajectories necessary to support the transition, thereby enabling analysis of different financial flow volumes and optimal allocation strategies across the energy supply value chain.

However, even within a multi-scenario approach, regular updates of existing models to reflect changes in the remaining carbon budget, combined with the development and integration of new scenarios explicitly designed to incorporate financial flow, could offer a more accurate and credible understanding of the evolution of sustainable and fossil-related financing over time. In the interim, and pending the availability of such dedicated scenarios, reliance on up-to-date and recognized scenarios, such as the IEA's NZE scenario, remains a robust and practical alternative.

Correspondence table between classification systems
Given that the data processed by BNEF is sourced from a range of databases and providers, the classification systems used to categorize companies can vary (such as GICS, NACE, BICS, etc.). This diversity in classification schemes could undermine the comparability of data. Therefore, the development of a comprehensive and open-source correspondence table linking these various classification systems could facilitate comparability across various levels of analysis—whether at the industry, sector, or sub-sector level. Furthermore, this kind of tool could be extended to enhance alignment between real-world economic classifications and the Climate Policy Relevant Sectors (CPRS) – a nomenclature employed by Integrated Assessment Models (IAMs) to build sectoral decarbonization pathways – ultimately enhancing the accuracy and strategic relevance of climate scenarios used by financial institutions to set financial target.

Structuring a transparent, expanded, and integrated ESR approach: toward a systematic aggregated indicator accompanied by sub-indicators for improved assessment
To effectively monitor the evolution of sustainable and fossil financing, it is essential to define a clear and precise scope of analysis and ensure enhanced transparency.

In this context, establishing an aggregated ESR indicator is crucial. This aggregated indicator must cover the full range of a bank's financial products and services. Only such an indicator can provide a comprehensive and coherent overview of the allocation of financing between fossil energy and sustainable alternatives.

However, to refine the analysis and meet additional objectives, this aggregated indicator can be complemented by two disaggregated sub-indicators.

- The first objective of these sub-indicators is to respond to stakeholder expectations, particularly from analysts, by providing a more detailed understanding of the financial products and services that either accelerate or hinder banks' energy transition efforts.

- The second objective, which reinforces the first and lies at the heart of this proposal, is to enhance the credibility of banks' transition plans by ensuring coherence between financing indicators and emissions indicators. As highlighted in ShareAction's 2024 report (2024), a vast majority of banks analyzed define decarbonization targets without explicitly linking them to their financing objectives.

To ensure consistency with emissions indicator type already used by financial institutions, and to improve transparency, two perimeters can be defined for the sub ESR indicators: financed flows and facilitated flows.

- Financed flows should include, at a minimum, all loans, such as project finance and labelled use-of-proceeds based sustainable debt.

- Facilitated flows, in turn, should include, at a minimum, financial products and services such as initial public offerings (IPOs), equity issuances, and bond issuances, thereby reflecting the role of financial institutions as intermediaries in capital markets.

However, the publication of either of these complementary sub-indicators should not replace the publication of an aggregated ESR. Only the latter allows for a comprehensive assessment of the financial support a bank provides to the energy transition.

It is important to note that these financial indicators must capture the full amount of financing. Any reduction based on the nature of the financial product or service would compromise the fundamental principle of these indicators, which is to cover all financial support mechanisms[7].

Standardizing the adjustment factor methodology

The adjustment factors proposed by BNEF's methodology are primarily based on revenue sources at a specific point in time to approximate a company's activities. An improved method would involve offering multiple approximation options depending on data availability, prioritizing precise information on the destination of capital expenditures (capex), followed by revenue sources, and finally any other relevant data that could refine the estimate. Standardizing this approach would enhance transparency regarding the quality of the proposed indicator.

To go further, other improvements can be considered in a second phase to strengthen the approach.

[7] The methodology for attributing emissions - both financed and facilitated - proposed by PCAF (2022; 2023) has sparked significant debate, raising concerns about the robustness of the emissions indicators built on this basis. In the case of financed emissions, the "follow the money" approach complicates the ex-post evaluation of the actual decarbonization achieved by financial institutions, thus requiring attribution analyses to assess the actual reduction in emissions associated with financial activities (Bouchet, 2024). Regarding facilitated emissions, the PCAF methodology applies a weighting factor of 33% when calculating emissions linked to facilitation activities. This factor, which is lower than the 100% recommended by SBTi (2024), could, according to ShareAction (2023), not only add complexity, but may also lead to emissions indicators that do not adequately capture the climate impact of such activities. Although emissions assessment is not the central focus of this article, ensuring consistency between financing and emissions reduction objectives remains essential. In this context, it could be underlined that some stakeholders are now advocating for a full accounting of emissions related to financing and facilitation activities – without attribution – thus aligning with the approach proposed for the ESR in this article, which considers the entirety of financial flows without applying any weighting.

Data used : Improving the granularity of data by incorporating more detailed information on companies' investment expenditures would yield more accurate and representative results.

Construction of regional ratios and scenario downscaling : The development of regional reference ESR indicators, as suggested in BNEF's work (2023), would enable a more precise alignment of these ratios with the economic, energy, and climate dynamics unique to each region. Achieving this would involve adapting global scenarios to the regional level – particularly through the application of downscaling methods – providing financial institutions operating predominantly in a specific geographic area with a benchmark that more accurately capture regional specificities.

Complementing the "Supply" approach with a "Demand" approach : Developing a second "green-to-brown" ratio, this time dedicated to assessing financial flows linked to final energy consumption (the demand side), represents a key step in complementing the analysis of financial dynamics within the energy transition. This ratio would provide financial institutions with an effective tool to steer financing toward energy efficiency and emissions reductions across critical demand sectors such as transport, buildings, and industry.

As a counterpart to the energy "Supply" ratio, this demand-side indicator would offer greater visibility into the financing needs associated with energy efficiency and energy use transformation. It would enable the tracking of investments in initiatives such as building renovation, fleet electrification, or the integration of low-carbon technologies into industrial processes. These initiatives are critical levers for reducing fossil energy demand and aligning economic activities with climate goals.

However, this approach presents several methodological and operational challenges. First, defining the specific perimeters for each end-use sector is essential to ensure consistent and standardized analysis at the consolidated demand level. The specific features of each sector – including differences in technology readiness levels (TRLs), asset lifecycles, and investment patterns – require particular attention to avoid biases in financial flow assessments. Furthermore, the risk of double counting, especially in interconnected sectors such as transport and energy infrastructure, must be carefully addressed to preserve the robustness and comparability of the ratio.

By integrating this demand-side perspective into financial flow analysis, financial institutions would be better equipped to evaluate the effectiveness of their transition strategies and prioritize investments accordingly. When combined with the supply-side ratio, this second indicator would offer a more comprehensive overview of the financial efforts required to meet the challenges of the energy transition. This complementarity would ultimately strengthen the ability of financial actors to align their capital flows with climate pathways, while preventing imbalances between investments in energy production and those needed to transform energy consumption.

Conclusion

The publication and adoption of targets based on a robust Energy Supply Ratio (ESR) are emerging as a crucial tool for banks seeking to align their energy sector financing with climate objectives. As part of a broader and evolving shareholder engagement dialogue, this tool aims to enhance transparency and guide the reallocation of financing in support of the energy transition. This is illustrated by the 2024 initiative of the New York City Comptroller, who, on behalf of three municipal pension funds, submitted a shareholder proposal at the general meetings of six banks, requesting the annual publication of a "Clean Energy Supply Ratio." The subsequent shift in terminology toward "Energy Supply Ratio" in 2025 reflects a growing recognition of the need for a more systematic, harmonized, and consolidated framework for reporting such indicators.

In this context, the present article – part of a broader body of work led by the ILB – has outlined some key methodological principles required to construct a standardized, relevant, and effective ESR capable of meeting the expectations of financial institutions – primarily banks – seeking to demonstrate their commitment to the energy transition.

On one hand, the supply-side focus allows for structuring the analysis around financing dedicated to energy production and its entire value chain. A clear and comprehensive definition of energy sources – both sustainable and fossil-based – is crucial for conducting such an analysis. On the other hand, this ratio represents a valuable opportunity for banks and their stakeholders to assess the financial actions implemented in support of the energy transition, while comparing them to the actual financing needs required to meet climate goals. Producing a specific flow-based indicator as part of a broader ratio would allow for a dynamic evaluation of progress over time and the inclusion of a wider range of financial instruments and capital market tools. Moreover, the use of robust climate scenarios, such as the Net Zero Emissions (NZE) pathway from the International Energy Agency (IEA) – which estimates that the ratio of annual investment between fossil energies and their alternatives must reach 6 to 1 by 2030 – is essential to ensure the credibility and relevance of the ESR ratio to provide a comprehensive view of the financing mobilized in support of the energy transition.

Going forward, we encourage banks seeking to demonstrate their climate commitment to produce such indicators in the most granular manner possible, including detailed reporting of the amounts mobilized. This would facilitate the development of meaningful Brown-to-Green ratios, such as the ESR, grounded in a more standardized methodological framework and better aligned with the financing needs required to achieve climate goals.

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