Integrating the Concept of Planetary Boundaries into Decision Making Processes

Marcial Vargas-Gonzalez

Abstract What is absolute sustainability? This question has been the centre of discussion for many years now. During this session, several stakeholders tried to bring their own answer to the question, discussing issues like the current Science-Based Targets approach, SDGs, resource criticality and the development of targets based on the earth's regenerative capacity. And while different topics were addressed and the need to develop more robust approaches was apparent, all presenters were aligned on the need to help companies incorporate the notion of planetary boundaries in their business practices in order to address as quickly as possible the environmental issues of the 21st century.

1 Introduction

What is sustainability? This question has been the centre of discussion for many years now. From the environmental point of view, sustainability was considered up until now as improving the environmental performance of your company or product. This was therefore about being more sustainable than someone else's company or product but not about becoming sustainable in absolute terms.

The Planetary Boundaries concept provides insights on what environmental sustainability means at the global level, i.e. what is the planet's resilience threshold within which we can keep developing. This being said, a major question arises: how can we translate such concepts at a corporate level to enable better decision-making processes?

Two levers are being currently investigated:

- Using Planetary Boundaries as a new normalization system in LCA approaches to assess the product's sustainability and the material challenges it faces [1, 2].

M. Vargas-Gonzalez (✉)
Quantis International, Paris, France
e-mail: Marcial.vargas-gonzalez@quantis-intl.com

- Using Planetary Boundaries to define science-based corporate targets to provide a way to define environmental strategies strengthened by a recognized scientific approach. A method that has gained considerable momentum thanks to the Science-Based Targets Initiative, which focuses on the climate change issue [3].

This session was the opportunity for companies and academia to discuss the concept of Planetary Boundaries, its integration at the corporate level (the approaches and methods being developed), its operationalization but also the limits of such an approach.

2 Presentation Summary

Trough 5 presentations, this session helped understand how the planetary boundaries concept was first applied to carbon emissions by the existing sectorial decarbonisation approach, paving the way for new methodologies and the assessment of different aspects and sectors including: the carbon emissions of the agri-food sector, the development of targets beyond carbon, resource criticality and the alignment of SDGs and Planetary Boundaries.

2.1 Sectoral Pathways to Low Carbon Economy Shall Drive Transition Planning and Companies' Decision Processes: The Key Learning's from Assessing Low Carbon Transition Initiative's Pilot Phase

Recently, the main environmental concern for companies and states alike has been to drastically reduce carbon emissions in order to remain below the 2 °C target set during COP21. And while climate leaders have assimilated existing tools like carbon reporting and the Sectoral Decarbonisation Approach (SDA), carbon emissions continue to rise.

During this presentation, it was discussed how the ACT approach developed by CDP and ADEME can help companies ensure that their approach is aligned with the level of decarbonisation needed. It provides sectorial assessment methods with a holistic view helping companies in the electric utilities, automobile and retail sectors improve their climate strategy, business mode, investments, operations and GHG emissions and GHG emission management.

While ADEME's work shows that companies are ready for the transition, several hurdles remain like the inclusion of new sectors in the existing methodologies, the inclusion of SMEs in the carbon discussions and the extension of the approach to include other environmental indicators.

2.2 Defining Science-Based Targets for an Agri-food Company: A Case Study

In line with the observation made by ADEME, today, more than 300 companies have committed to the Science Based Targets initiative showing the way to a 2 °C temperature rise scenario. However, as previously mentioned, in order to make sure those targets are reached, it is key to define manageable targets in line with the company's structure which can be difficult when considering that several sectors are not described in the SDA approach.

This is the main purpose of Quantis & Ecofys' work, defining science-based targets for a couple of agri-food companies using the SDA approach. This shows not only the needed methodological developments, including the development of reduction pathways for several crops, but also the need to have a common structure when building a "SBT strategy". In order to meet their goals, companies need to understand the calculations and commitments that have been validated before companies start strategizing and acting.

The key message is that even though developments are still ongoing, it is possible for companies to start acting immediately with a pragmatic framework and approach.

2.3 One Planet Thinking: Towards Companies That Perform Within the Earth's Regenerative Capacity

While the main focus has been carbon issues, the fact that we used the regenerative capacity of 1.6 planets in 2012 at present consumption levels demonstrates the urgent need to act within the earth's regenerative capacity beyond carbon and to start addressing all environmental issues. As previously proved, this can be managed with a pragmatic and operational approach in line with industrial needs.

Inspired by the concept of planetary boundaries, which was introduced by Rockström et al. in 2009 [4], Ecofys developed One Planet Thinking (OPT) together with Eneco, an energy utilities company in the Netherlands, with the aim to link corporate activities to global, regional and local boundaries to set targets for climate change, particulate matter, fossil and mineral resources.

The approach has its limitations but the overall framework shows that the use of pragmatic approach can ensure the development of sustainable business practices in a company. Moreover, this presentation shows that including other environmental issues in the "science-based targets" approach is possible, even though different issues (spatial focus, time variability) must be understood and included before we consider the methodology robust and streamlined. The issue of criticality exemplifies this issue.

2.4 Criticality Methodology for Resources: How to Apply to Construction in the Future?

Criticality as a concept refers both to the potential impact of shortage of a resource and to the probability of such a shortage, as such it is an essential issue when discussing the absolute sustainability of resource use.

Understanding criticality is therefore a first step in the understanding of resource use mechanisms and how setting a target for resource use might be attained in the future. And even though the presented approach did not focus on the target setting aspect of criticality, it detailed what should be assessed when evaluating the sustainability of resource use including rarity and spatial level of focus. This last aspect itself is quite innovative, as resource scarcity has been classically considered as a global issue while this methodology suggests it might not be the case for all resources.

Overall, this work seems necessary in order to better understand the implications of resource scarcity and the elements to be considered before defining reduction targets for resource use.

2.5 Operationalization of Sustainable Development Goals Using a Planetary Boundaries-Based Life-Cycle Assessment Framework

In 2015, the international community formulated the Sustainable Development Goals (SDGs) [5], this set of goals is supposed to help achieve sustainable development. This implies that existing SDGs should lead companies and countries to develop within the earth's regenerative capacity.

However, until recently, no framework had been developed on how to integrate the idea of Planetary Boundaries with the SDGs. The work presented showed how planetary boundaries could be used to compare countries' current activities with overall SDGs, assessing if economic sectors are aligned with the international targets.

This offers a new vision of how companies and countries can simplify their approaches and use the Planetary Boundaries approach as a key to identify material issues and be aligned with SDGs, the overall goal being to reduce the number of KPIs needed to assess their activities. This underlines once more how sustainability must be operationalized if we want international targets to be met by the industrial sectors.

3 Discussion

Through these five presentations several common issues transpired, showing that companies and governmental are both struggling with absolute sustainability and its implications. Most issues arise from the lack of robust methodologies and data that could be applied for different environmental aspects and for varied economic sectors. Leading to the question: are science-based and context-based approaches scientific enough?

Presenters emphasized on the need to further detail, improve and complete existing methodologies in order to consolidate the efforts and build an approach that is both scientific and operational. However, it seems unreasonable to expect stakeholders to wait before they start acting and setting targets, as environmental issues must be addressed with urgency. It therefore seems that while current approaches are only the first building blocks in the development of absolute sustainability targets, they should be integrated into decision-making quickly and improved on a regular basis.

Moreover, the work presented during these presentations showed that there is a real academic and industrial demand for science-based and context-based approaches. This leads presenters to believe that these new methodologies will develop quickly and will be aligned with current scientific practices and evolutions in the near future, with developments focusing on: the inclusion of new sectors in existing methodologies, the development of a general framework for planetary boundaries-based targets and the operationalization of existing approaches at the corporate and national level.

The main hurdle remaining is the definition of an approach that is scientific and robust but that can also be easily implemented at the corporate level and included in the decision-making process.

4 Conclusions

With the definition of an international target during COP21, the attention turned away from conventional target-setting ways and companies stated their need to define their own science-based targets. The approach has quickly caught on despite the different difficulties companies have identified. It seems however necessary to address these issues in order to develop more robust approaches, including the development of approaches for issues beyond carbon, that remain operational and easy to implement and track.

And while most of the presentations focused on the methodological evolutions that will lead to a more transparent approach to target setting, all presenters were aligned on the need to help companies incorporate the notion of planetary boundaries in their business practices in order to address as quickly as possible the environmental issues of the 21st century.

References

1. Bjørn A, Hauschild M.Z, Introducing carrying capacity-based normalisation in LCA: framework and development of references at midpoint level, *The International Journal of Life Cycle Assessment*, 20(7), 1005–1018, 2015, <http://doi.org/10.1007/s11367-015-0899-2>.
2. Bjørn A, Margni M, Roy P.O, Bulle C, Hauschild, M.Z, A proposal to measure absolute environmental sustainability in life cycle assessment. *Ecological Indicators*, 63, 1–13, 2016. <http://doi.org/10.1016/j.ecolind.2015.11.046>.
3. Sandin G, Peters G.M, Svanström M, Using the planetary boundaries framework for setting impact-reduction targets in LCA contexts. *The International Journal of Life Cycle Assessment*, 20(12), 1684–1700, 2015, <http://doi.org/10.1007/s11367-015-0984-6>.
4. Rockström J, Steffen W, Noone K, Persson Å, Chapin III F. S, Lambin E, Lenton T.M, Scheffer M, Folke C, Schellnhuber H, Nykvist B, De Wit C.A, Hughes T, van der Leeuw S, Rodhe H, Sörlin S, Snyder P.K, Costanza R, Svedin U, Falkenmark M, Karlberg L, Corell R. W, Fabry V.J, Hansen J, Walker B, Liverman D, Richardson K, Crutzen P, Foley J, Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society* 14(2): 32, 2009, [online] URL: <http://www.ecologyandsociety.org/vol14/iss2/art32/>.
5. World leaders adopt Sustainable Development Goals. United Nations Development Programme. Retrieved 25 September 2015.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.