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DOI

[10.15396/eres2023_244](https://doi.org/10.15396/eres2023_244)

Publication date

2023

Document Version

Final published version

Citation (APA)

de Jong, P., Remøy, H. T., & Heurkens, E. W. T. M. (2023). *Directions for a sustainable real estate strategy*. Paper presented at ERES 2023, London, United Kingdom. https://doi.org/10.15396/eres2023_244

Important note

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Directions for a sustainable real estate strategy

Peter de Jong¹, Hilde Remøy, Erwin Heurkens

Delft University of Technology / Faculty of Architecture and the Built Environment / Department of Management in the Built Environment, Julianalaan 134 – 2628 BL Delft, Netherlands,

①corresponding author: p.dejong@tudelft.nl

Abstract

Purpose – The Delft University of Technology adapted their sustainable mission and wants to apply it also to the corporate real estate management. To allow decision making based upon a more integral approach from a long term perspective, a choice is made for 'total cost of ownership'. The project managers, asset managers, facility managers, and financial account managers then ask for data, and they actually need a compass to interpret that data. The purpose of this paper is to find that compass.

Design/methodology/approach – A theory-practice oriented approach is followed. A literature review is conducted to identify the need for a new economy that distances itself from outdated neo-liberal models and gives space to a material-driven circular approach on the one hand and the more pragmatic life-cycle cost (total cost of ownership) approach on the other.

Findings – It appears that the doughnut economy offers the compass that the practice currently needs. It offers scope for making assumptions in a period in which people know which way things are going and at the same time want to have 'hard data'.

Quality/value – The study has the potential to support the university's real estate management in its aim to meet its sustainable mission and to set a general approach for a sustainable real estate strategy.

Keywords

Doughnut Economics, Circular strategy, Total Cost of Ownership

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Introduction

By 2030, TU Delft aims to operate in a completely sustainable manner. All activities on and from the campus should be carbon neutral, circular, climate adaptive, and contribute to the quality of life for its users and for nature (*Climate action on campus, 2020*). In the chapter on governance in this mission, it is declared that TU Delft intends to become an entirely sustainable organization, not only by the measures implemented on the campus and the resulting carbon and circular performance but also in the way the university is organized. Financial and regulatory incentives (carbon pricing, total cost of ownership, circular contracting) should steer processes towards sustainability.

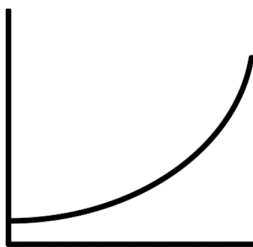
This also means that we want to deal with our real estate in line with that mission. That should be possible because we have a substantial amount of land and buildings that are not for profit. Having those land and buildings is mainly intended to ensure that it will still be a highly regarded university in another 100 years. Resources are used for that. No profit, although of course you shouldn't run out of money on it. If you lose out, it will be at the expense of education and research, at the expense of students and staff. Such an approach to property management is easier and therefore easier to implement for organizations that prioritize use over profit. A university can take the lead in this, also because working towards a sustainable economy and the associated knowledge development fits in with the core tasks of research and education. At the same time, such an approach should also work for other civil society organizations and governments. However, the way in which this is done cannot be done without also choosing an economic system and the deep-rooted realization that this is a far-reaching choice to make.

Degrowth

Both in real estate education and in contacts with practice, there is a frenetic attempt to cram new thinking into the existing business case. This results in requests for government support or subsidies, as long as short-term profits can be secured. All that new thinking, whether it's about circularity, flexibility, adaptability, or sustainability in general, is based on a broader value proposition, beyond margins or returns, over the long term (Heurkens, 2018; Remøy & de Jong, 2018; Remøy & Wandl,

2022; Verheul & Heurkens, 2021; Wilkinson et al., 2014). Trying to fit into the traditional business case is a denial of future value (Knibbe, 2023). Where did it go wrong?

Modern economic theory, including construction economics, is built on the idea of perpetual growth (Gupta, 2016; Schenderling, 2022). Trees grow to the sky and beyond. Businesses must boost their profits annually (otherwise their shareholders will walk away). As a result, consumers use more in an excessive way each year. And if it doesn't, everything really fails! Current economic systems show signs of failure.

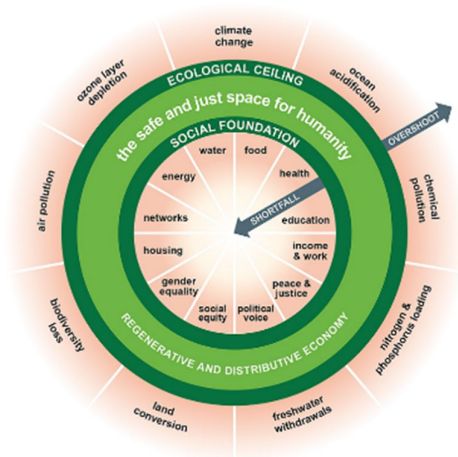


Of course, growth is a positive development when starting a business. The pursuit of a good competitive position leads to an increase in production and quality. However, there is no workable mechanism to turn this growth into a stable situation.

The expectation that by 2050 we will find more plastic than fish in our oceans is one of the results of this unending growth (Raworth, 2017a).

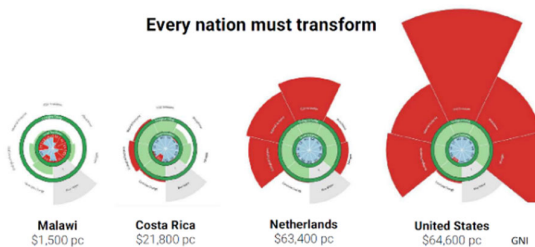
Therefore, there is a pressing need for economic models that provide an alternative or, at the very least, a strategy for addressing degrowth.

Figure 1 The Doughnut of social and planetary boundaries (Raworth, 2017b; Steffen et al., 2015), id. 2 and 3

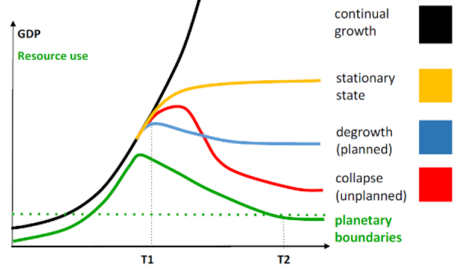


Degrowth is a topic of discussion among several forward-thinking economists at the moment. Likewise, Kate Raworth's doughnut economy gives a picture of the limits of what is needed. On the one hand, an outer boundary that takes into account the ecological ceiling (or planetary boundaries). On the other hand, there should be an internal cap on the minimum level of social security in all its facets. The region where economic developments can occur is the doughnut's zone.

Inequality between countries in the world in particular paints a picture in which some countries face a major challenge in addressing social insecurity, while the largest economies are also the largest polluters and therefore face the greatest challenge in reducing their share for a healthier society.



What is the likely GDP pathway for high-income nations aiming to live in the Doughnut?



The illustrations may suggest to deal with the doughnut economy on country level, but city (Holden, 2020), neighbourhood or organisation level is equally relevant.

Back to the growth perspective, there is a choice whether or not to consider a stabilization approach. It may be obvious that this is not an exact science, but eternal growth is certainly not logic, while in the end few people will want to head for the collapse scenario.

Fortunately, a number of methods have been on the doorstep for some time to contribute to a solution (van Staveren et al., 2022). Of course that is circular construction (and to a lesser extent circular economy - aspect approach and no economic model). Total Cost of Ownership to bring the bigger picture together and LCA to support choices in the design and purchasing process (Van Bueren & de Jong, 2007).

Total Cost of Ownership

In order to support sustainable decisions, a long-term perspective on financial decisions is needed. TCO (total cost of ownership) includes exploitation costs and benefits and considers the residual value of a building or product and its materials. The capitalization of environmental impacts is also possible. Therefore, TCO will become the basis for financial decisions. (Climate action on campus, 2020).

Looking at real estate from a sustainable mission can be summarized under Total Cost of Ownership (TCO) or just as well life-cycle costs. The bottom line is that you map out all current and future costs, including those that still need to be developed, and compare them with existing and new value concepts. Key word here is 'all'; as broad and integral as possible and necessary. Cash flows are the appropriate means of comparing those costs and benefits over the years. Interventions can continue with a positive balance.

For example, the current form of CO₂ pricing shows that the correct processing of such cost types is still a journey of discovery. At the same time we are only at the beginning of how various depletions and pollutions should be visualized. Nitrogen and biodiversity are under pressure. It also quickly becomes clear that 'the polluter pays' must be applied as directly as possible and must not degenerate into a right to pollute. It is logical to tax CO₂ on the basis of emissions and to book CO₂ pricing as a tax (literally and figuratively). It is equally logical to do so directly and generously and, as long as it does not actually have to be paid, to use this money to reduce and prevent emissions. Investing to become a healthy company. Wanting to pay taxes for the damage you cause also requires that other economic system.

A dangerous side of TCO as a cost approach is that you can fairly easily make the end financially transparent. Demolish, clean up and done. This may be in keeping with current economic thinking. For example, cash flows also work very well in return calculations. So it cannot be seen separately from that mission to want to look at it sustainably and integrally. The non-financial aspects must also

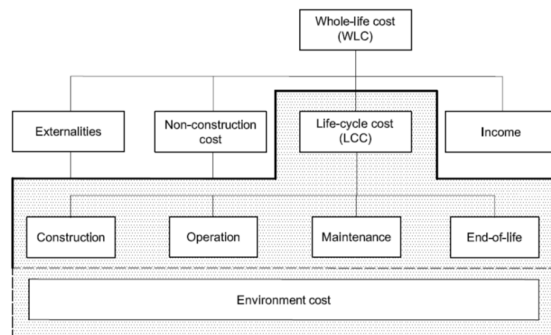


Figure 5, traditional representation of TCO

be properly mapped out or even made financial. A claim on trust (Gupta, 2016) will definitely add to a new value definition, needed for e.g. long term relations for circular building.

A positive side of such a life-cycle cost approach is that you can also demonstrate that with a good focus on management and maintenance, there is little reason to calculate with the short lifespans that are now customary. Good buildings demonstrably function for longer than the often used 50 years and are also appreciated more over time. By combining property and area

management, it can also be made clear how much greenery and water can contribute to the total quality and value.

The cost approach with lifespan or Total Cost of Ownership remains intact with the right perspective. But the question still remains: how? In fact, an integral assessment of everything is required. At the very least, it is an explosion of data needs. It seems obvious that the Doughnut economy can work as that new economy and can therefore be a compass for sustainable property management. See also the strong agreement with the Brundtland definition for sustainability (Brundtland, 1987), which is also strong for course setting. But it also helps the benevolent employee who has to weigh up the interventions at a detailed level. For example, the question of the desired amount of ventilation in a room if you want to take into account the impact on costs, people, well-being, energy, nature, etc.

Internal carbon tax

Based on various sources and to make amends for damages of the past, TU Delft is investigating the possibility to use a carbon price at the value of € 150 per tonne of CO₂-equivalent and how to include this in its everyday financial system. This carbon price can possibly be used for financial decisions, to compare alternative plans, with selections of suppliers, for price adjustments, to define carbon budgets, and as value for an internal carbon tax (e.g. imposed on flights) (Climate action on campus, 2020).

Anticipating regulation offers the chance to already calculate with this tax and to deal with it as a reservation. This is especially true at a time when the CO₂ tax, let alone all other environmental costs like PFAS, airborne particulate matter, nitrogen oxides, etc., has not yet been decided upon. Of course, a university benefits from this research aspect and has a social responsibility as a result. This strategy encourages and guiding research in the correct directions while also enabling a cash flow that is ready for the future. Additionally, it provides a better estimate of CO₂ cost than "the right to pollute".

Life Cycle Analysis

In addition to the Total Cost of Ownership approach, there is the Life Cycle Analysis (LCA). In essence, not very different from the TCO design, but more often used and more applicable for the (technical) lifespan of parts, where TCO can be applied at building and area level (stock), including the transitions therein. The focus on the component makes it easier to visualize the ecological ceiling, the critical limits: climate change, ocean acidification, chemical pollution, nitrogen and phosphorus saturation, fresh water abstraction, land conversion, reduction of biodiversity, air pollution and degradation of the ozone layer – the extended version of ‘environment cost’ in the scheme (figure 5). It is therefore logical to give space in the Total Cost of Ownership to the aspects of food, health, education, income and work, water and sanitation, energy, networks, housing, gender equality, social justice, political participation and peace and justice – the extended version of ‘externalities’ in the scheme (figure 5). Of course, within the given context of real estate management of a campus, not all dimensions will be proportionate. Just like some critical boundaries have more to do with that campus than others.

Current LCA methods are still limited in what to compare against, and the conditions of processes are not optimal for each material (van den Berg, 2023). For example, in an analysis of wood versus concrete, the wood is often still calculated over great distances, while concrete comes from a factory nearby. In itself it is desirable to count on all the energy of transport costs. The logical adjustment is then to realize a local production forest, to be able to use it in twenty years.

Circular economy or circular contracting

Procurement of stationary, furniture, equipment, materials and services proved to be the greatest cause of carbon equivalent emissions at TU Delft. The embodied carbon of these products can only be tackled by a full supply chain approach, from producer to end-user. Therefore, circular contracting, which can secure the sustainable production, transport, maintenance and final stage handling, is essential to cut down on carbon emissions. We are already working with circular contracting (Climate action on campus, 2020).

As the above citation reveals, we want to be circular, if necessary in the old economy principles, but looking ahead to a new economy, addressing the doughnut economy and become sustainable.

In real estate, the best approach is often to maximize the life of buildings, and where parts have a shorter lifespan, to optimize these replaceable parts through LCA validation (Wouterszoon Jansen et al., 2020). Replaceability requires flexibility, which in turn must be made possible in the design. Flexibility can hardly be realized in the traditional business case, but it can be valued in a TCO approach

Conclusion

The doughnut economy is far from rocket science; it's economy. To do justice to the pursuit of circularity, inclusiveness, flexibility, adaptability and sustainability, and to escape the frenzy of perpetual growth, we need to move away from current economic models and the traditional business case in real estate. Total Cost of Ownership, according to Delft University of Technology's non-profit Real Estate Department, is the fundamental strategy to handle this transition.

Looking for new models, the doughnut economy is an interesting option that gives direction to the boundaries within which the solution must lie. A compass, but as yet no final destination. Again, in Delft we consider the necessary data collection and definitions as a very relevant research topic. This will also be an ask for collaboration with other universities, given the specific position in real estate regarding to ownership and aspirations and the unique building typology. Also on a more systematic level, e.g. the value of long-term cooperation based on trust instead of short-term profit, needed for the implementation of time-related issues, research is needed. The instrumental level, tools for future LCA-methods, ranking of sustainability, circularity and the social foundation of the inner circle of the doughnut, is something we must do and cannot do without the others. Given the urgency of the matter, we already started while researching and while the open invitation is out. For our demand for biobased material in 20 years' time, we should have started yesterday with planting our trees.

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