Pathways to Sustainable Building Markets through Credible, Comparable Lifecycle-based Information

Communicating environmental impacts such as climate change in ISO type III environmental declarations (EPD)

Context

In 2020, the buildings and construction sector accounted for almost 40% of global energy-related GHG emissions, 35% of final energy demand, and a large share of global resource extraction (2021 Global Status Report for Buildings and Construction, GlobalABC). How we construct our buildings and cities is an example of unsustainable consumption and production practices. Hence, without a doubt the way we build and use our buildings must change if we are to reach the climate change mitigation targets set out in the Paris Agreement and to reduce burdens associated with the construction of buildings.

The assessment of potential environmental impacts associated with a product, a process, or a system, along its life cycle, from the extraction of raw material to the end of life, is called life cycle assessment (LCA). Adopting a life cycle thinking approach (LCT) for the built environment, allows decision makers to assess burdens and benefits associated with construction through its life cycle, including its supply chain, and to avoid solutions that shift burdens along the life cycle. In fact, most companies' total carbon emissions are created by their supply chains, either upstream or downstream, and not the processing facility. For instance, the manufacturing of building materials is responsible for 10% of the buildings and construction sector's energy-related CO_2 emissions (although this is likely an underestimate as it does not, for instance, include emissions from bricks production). If practices do not change, this trend could worsen as global material use is expected to more than double by 2060, with a third of this rise attributable to materials used in the building and construction sector (2020 Buildings-GSR, GlobalABC).

All stakeholders along the life cycle of the building and construction industry such as financers, manufacturers, constructors, real estate agencies and users, have an important role to play in improving the overall carbon performance of buildings (Key Levers for Market Transformation, GlobalABC). Wholistic policies based on life cycle thinking are key in reducing carbon impacts of the sector. They would, for example, allow producers to evaluate their supply chains and to develop a set of actions to increase the demand for better products/services. There are many tools that can be used to apply LCA to identify methods to reduce emissions of the building and construction sector. For example, the SCP Hotspots Analysis Tool (SCP-HAT) can be used to identify hot spot areas of unsustainable production and consumption along supply chains in order to support setting priorities in national sustainable consumption and production and climate policies. Additionally, communicating this information through coherent and simplified labeling processes is important to drive unified decision-making processes across different stakeholders. An example of a labeling tool is environmental product declarations (EPD). In brief, these labels summarize the environmental impacts in numbers of the production of any product (mobile, clothes, building materials, etc.), even food and the production process of the product as well as its composition. The development of a product EPD can

encourage producers to develop a sustainable supply chain by providing, e.g., reliable materials data. When architects, designers, engineers, users, consumers or customers learn of any materials or product's EPD, they can easily differentiate between sustainable products and/or materials and wasteful ones creating credible, comparable lifecycle-based information.

Challenges and Opportunities in MENA

Challenges

There are four main obstacles to conducting a proper LCA in Egypt, as an example from the Middle East and North Africa. All of these obstacles are tied to one another in the sense that one obstacle leads to the emergence of another. These are:

1. Poor data Quality

One of the main pillars of conducting an LCA is proper data quality. LCA investigates the input and outputs (energy consumption, natural resource extraction, etc.) of system production. Therefore, extensive data is needed in accordance with these inputs and outputs. Similarly, we must rapidly improve the process of creating and sharing transparent LCA data for buildings, as the current availability and consistency of the carbon intensity data associated with building components and materials in different parts of the world is of particular concern. However, studies have shown that around 70% of all upfront embodied emissions are associated with only six materials – It would seem plausible that, through industry focus and collaboration, we can drive reduction of embodied carbon emissions through research, development and knowledge sharing (Net Zero Buildings: Where do We Stand?, WBCSD).

2. Lack of awareness and hence, policies

The term LCA or LCT is not yet well known in Egypt, and the region. This leads to construction companies not applying the concept in their business models. Governmental bodies should take up an interest in LCT especially since it can help formulate modern policies that ensure the reduction of greenhouse emissions in the face of the climate crisis.

3. Lack of industry collaboration

Value chains, especially in the buildings and construction sector, are highly fragmented, which makes it difficult to create a system that seeks collaboration across the value chain. The demand side actors such as developers, investors, owners, and end users, as well as cities, have influence over if and how buildings are constructed but they do not have an active role in the delivery and do not account for the full carbon emissions. Yet, they can play a significant role at the beginning of building projects to improve the overall carbon performance. To move the building and construction system to "net zero" and transform the market, all actors from business, finance, policy and science need to work together (Market Transformation levers, GlobalABC).

4. High Costs of conducting LCA

The fees of conducting an LCA are a considerable obstacle for application in Egypt and the region, especially since the difference in currencies makes it seem costly. Local companies are not invested in spending money on a label that is neither known nor appreciated in the Egyptian market, especially for

companies that only serve the Egyptian or Arabian countries. Incentives are needed for clients and developers to drive carbon emissions reduction across and to encourage end user behavioral change. Similarly, regulatory and financial trends for building decarbonization must be in line with sustainable finance mechanisms.

5. Lack of trained personnel

Multinational companies in Egypt are the ones that opt to conduct LCA on their product due to their target market including the European market and the awareness of the owners. This category of companies usually conducts their LCA through the main headquarters which are based in Europe. Other companies cannot access LCA practitioners because they are minimal in Egypt. Although EPD Egypt thrives to expand its capacity building, there is still a long way to go. It should be also mentioned that expanding the practice in MENA or Africa can help create prices that are more affordable to local companies and facilitate the process of data gathering due absence of language barriers.

Opportunities

Opportunities of LCA are various and specific for each level of application.

- For an organizational company, an LCA is used to map the key drivers of the impact of their entire product. This in return directs their improvement strategies in ways beyond the company gates, such as through improvement in products and technologies, through synergies with industrial neighbors by exchanging materials and energy, and through better collaboration with other actors in the value chain.
- For national-level assessments, according to the European Commission testified in their Communication on Integrated Product Policy (IPP), LCA is the "…best framework for assessing the potential environmental impacts of products currently available". Therefore, while Egypt and the region embrace economic growth, they would require policies and assessments that ensure the growth is headed towards a sustainable market. These policies and assessments can be adapted from the basis of LCT and LCA as they proved to be foundational for the policies in Europe.
- Adopting an LCT and conducting an LCA is key to low carbon, efficient buildings being one of the biggest investment opportunities worth an estimated USD $24.7 trillion by 2030 (Green Buildings: A Financial and Policy Blueprint for Emerging Markets, IFC). Moreover, between 9 and 30 jobs are created for every $1 million invested in renovation and new construction, one of the highest rates across all sectors. There is therefore a real opportunity to use LCT to amplify these economic benefits linked with the assessment of whole life carbon impact, especially as Egypt embraces a period of economic growth.

Event Objectives

The objectives of this panel discussion are to:

1. Highlight the opportunities on national and organizational level
2. Show the importance of LCA for market transformation and building decarbonization
3. LCA opportunities for buildings and construction in Egypt and developing countries

4. Current status of LCA as applied to the buildings and construction sector in EPD in Egypt, MENA & Africa
5. Strategize a clear-cut way forward (beyond COP27) to infiltrate the Egyptian and neighboring regions market

Expected Outputs

This event will provide an opportunity to discuss some key considerations as we move towards COP 28, which will be hosted by the United Arab Emirates. An event report summarizing key points discussed including:

1. Identify the main obstacles in conducting building LCAs and EPDs in the MENA region
2. How each organization - whom each panelist present - can create an enabling environment to facilitate the development of LCAs in Egypt and developing countries
3. Emphasizing the opportunities in creating LCAs in terms of policy context
4. Overcoming the challenges raised during the panel discussion
5. Highlight the potential prospects that would facilitate the process of LCAs by manufacturing companies

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