



## Construction Value Chain Consultations

### Consultative workshop on sustainable construction value chain focusing on how planning and design frame action along the construction value chain

16<sup>th</sup> July 2021

#### WORKSHOP REPORT

##### Attendees:

Full list of attendees is available in the end of the report.

##### Workshop objectives:

- Introduce the value-chain approach, as developed by the UNEA requested [Task Group](#) on *Catalysing science-based policy action on Sustainable Consumption and Production*.
  - Share the key findings on the construction sector analysis.
- Understand the role of planning and design in the construction value chain and the influence they have on various stages of the value chain.
- Understand what planning and design initiatives/solutions currently exist that address sustainability along the construction value chain to:
  - define the opportunities for their scale-up and replication;
  - identify gaps and challenges to be addressed;
  - identify actions needed by stakeholders at other stages of the construction value chain to support decision-makers in the promotion of initiatives that aim at reducing negative environmental impact while improving the socio-economic contributions of the construction sector.

Full presentation of the meeting is available [here](#).

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#### MAIN MESSAGES

- The application of the ‘Value-Chain Approach’ to analyse the construction sector showed that the key decisions are made far from where natural resources are used. While the majority of natural resource use and environmental impacts takes place at the material production, construction and operation stages of the value chain, the most influential actors are governments, international organisations, financial institutions and major market players, who are primarily acting at the financing stage and the planning and design stage of the construction value chain. The key decisions made at these stages largely shape the activity along the rest of the value chain.
- As urban and territorial planners, and regulators of the construction sector, governments also indirectly determine what is being built, how much is being built and how constructions are being. How governments regulate the construction sector through tools such as building codes and zoning laws can influence the operations of actors along the construction value chain, especially at the



planning and design stage; the construction material stage; the construction stage; and, as a result, the use stage.

- Right construction and material choices during the planning and design stage are an important element when aiming to reduce resource use and improve environmental impacts. Using local construction materials and techniques, where possible, helps to create low-cost, low-energy, low-waste and easy-to-repair buildings. It also minimizes negative environmental impacts caused by transportation and it supports local suppliers and, as a result, has a positive socio-economic impact locally.
  - While in many developed countries the construction value chain needs to focus on re-using existing building and materials, there is a need for construction of new buildings in developing countries. For that, environmentally friendly solutions are necessary. Adding sustainability related targets to the design process, such as carbon, energy and water targets is an important step to ensure improved sustainability across the construction value chain.
  - Lack of sustainability data is an overarching challenge across the construction value chain. Collaboration of all stakeholders to gather and share relevant data is necessary in order to improve resource efficiency of the sector.
  - Successful implementation and scale-up of innovative solutions and new technologies can benefit from endorsements from governments as well as require local capacity building and training of construction workers.
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### SETTING THE SCENE

- Strengthening the science-policy interface by adopting the value-chain approach is one of the key elements in strengthening multilateral cooperation on Sustainable Consumption and Production (SCP).
- As part of this process, the One Planet network has planned a series of multi-stakeholder consultations to take place in 2021, focused on the high-impact sectors of food, construction and plastics.
- These consultations build on the findings of [the One Planet-International Resources Panel Task Group](#) on catalysing science-policy action on SCP, presented in this [report](#) “Catalysing Science-Based Policy Action on Sustainable Consumption and Production: The Value-Chain Approach and its Application to Food, Construction and Textiles”.
- This consultations series is focusing on the construction sector and dedicated to “Innovative business and policy solutions” along the construction value chain. It consists of 3 workshops focusing on how public procurement, financing, and planning & design influence the construction value chain.
- The outcome document of these workshops developed jointly with the participants will be the basis for the collaborative development of clear priorities for moving the construction sector towards SCP patterns.
- This was the second workshop of the series dedicated to how financing shapes the construction value chain. Full information on the construction value chain consultations can be found [here](#).



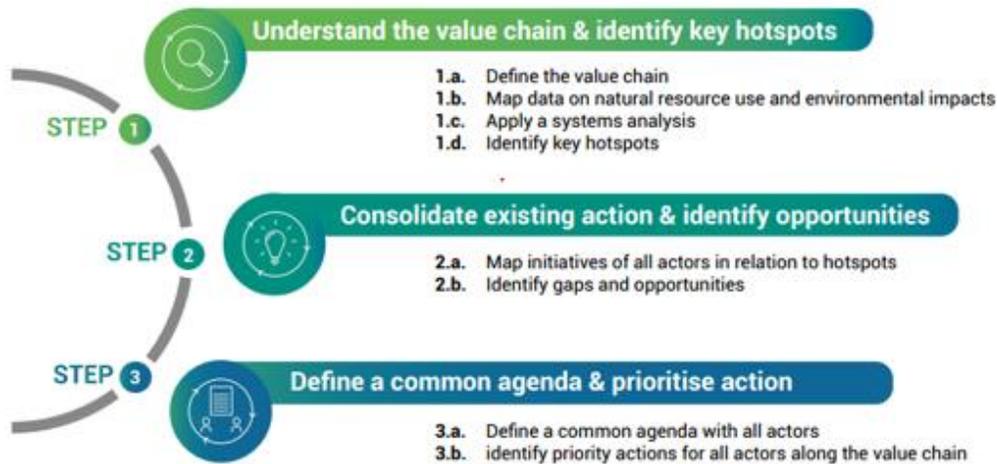
- The 10YFP Secretariat is convening these consultations in close cooperation with One Planet network's Sustainable Buildings & Construction and Sustainable Public Procurement programmes, UNEP's Sustainable Infrastructure Team, the Global Alliance for Buildings & Construction, Green Fiscal Policy Network, UN-Habitat and UNOPS.
- The work on the value chain approach in high-impact sectors will inform further discussions on a post-2022 strategy on SCP<sup>1</sup> lead by the UN Member States.

### **VALUE-CHAIN APPROACH AND ITS APPLICATION TO THE CONSTRUCTION SECTOR**

- The One Planet-International Resources Panel Task Group on catalysing science-policy action on SCP has been established at [the request the Member States at the 4<sup>th</sup> United Nations Environment Assembly](#).
- The [Task Group](#) aimed to catalyse science-based policy action on SCP, thereby providing actionable insights on the management of natural resources in relation to the 2030 Agenda for Sustainable Development. To achieve this, the task group took a sectoral focus and applied the 'Value-Chain Approach'.
- The '[Value-Chain Approach](#)', as developed by the Task Group, is a methodology for catalysing science-based policy action on SCP which identifies key points of intervention within economic systems to reduce natural-resource use and environmental impacts through a common agenda for action.
- By applying a systems lens, the socio-economic drivers and barriers that influence value chain operations of different sectors are identified, taking into account the complex feedback loops influencing the operations and behaviours of actors along the value chain. This approach shows that the key points of intervention are often not the same as where natural resource use and environmental impacts take place, making systems analysis essential.
- The 'Value-Chain Approach' identifies where the greatest opportunities for a shift to sustainable consumption and production exist, shapes corresponding actions by building on current knowledge and available data and engages the relevant actors.
- The Approach consists of three main steps:

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<sup>1</sup> The 10-Year Framework of Programmes on SCP (10YFP) was adopted at Rio+20 for the period 2012-2022. The 10YFP is included in Agenda 2030 under SDG targets 12.1 and 8.4. The One Planet network has formed to implement the 10YFP. The Network supports the global shift to SCP and the achievement of SDG 12. The reflection on the 10YFP post-2022 was initiated by the 10YFP Board in 2020 with other lead countries of the One Planet network as a collective effort to build a post-2022 vision for multilateral cooperation on SCP. These reflections will build on the experience of the 10YFP and its One Planet network from 2012.



- The Task Group has applied various steps of the 'Value-Chain Approach' to three high-impact sectors: food, construction and textiles.
- When it comes to the sector of construction, application of Step 1 has demonstrated that<sup>2</sup>: *“the majority of natural resource use and environmental impacts takes place at the material production stage, the construction stage and the operation stage of the value chain. However, there is limited scope at these stages to make the needed changes for several reasons, including the informality, fragmentation, complexity and availability of options. The most influential actors along the construction value chain are governments, international organisations, financial institutions and major market players, who are primarily acting at the financing stage and the planning and design stage of the construction value chain. The key decisions made at these stages largely shape the activity along the rest of the value chain. Construction is integral to achieving the SDGs, but direction is needed to ensure actual balance between sustainable development and the transition of the sector to resource efficiency, circularity and a smaller environmental footprint. Analysis shows that governments exert significant influence along construction value chain as 1) regulators of financial markets, 2) investors in the construction sector, and 3) urban and territorial planners, and regulators of the construction sector. Governments have a strong opportunity to ensure sustainability of the construction sector through these three key levers.”*
- The analysis of the construction value chain identified three core challenges:
  - 1) What types of construction is built and used, and where: different types of construction built in different locations and regions contribute in different ways to meeting needs of societies and achieving the Sustainable Development Goals, and can cause different pressures on the use of resources and environmental impacts.
  - 2) How much is being built: the construction market is growing worldwide, which causes pressures on resources and environmental impacts. However, construction does not necessarily follow demand. For example, empty buildings and property speculation is registered in many developed countries, while there is a construction gap in developing countries.

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<sup>2</sup> Full analysis available [here](#)



- 3) How they are built: the impacts of construction are associated with: type and amount of construction materials used, consumption of resources in the operation of buildings, and construction and demolition processes. Changing design, construction and use practices is fundamental to use resources more efficiently and reducing environmental impacts.
- Urban and territorial planning aims to support economic, social, cultural and environmental goals through developing visions, strategies and plans and applying policy principles, tools, institutional and participatory mechanisms, and regulatory procedures (United Nations Human Settlements Programme [UN-Habitat] 2015). The construction value chain is heavily shaped by practices of urban and territorial planning, as well as regulation such as building codes, which are applied primarily by governments and public authorities at national, regional, local and neighbourhood levels, and are also influenced by business and civil society. These planning practices and regulations have a significant impact on what is built and where, how much is being built, and how it is built, therefore effecting the associated levels of natural resource use and environmental impacts along the construction value chain. However, the existence of such regulation, as well as its quality and degree to which it is effectively implemented, is influenced by a number of factors and interests across different countries. For example, of the new buildings expected to be constructed to 2060, more than two-thirds of these will be built in countries that do not currently have mandatory building energy codes in place (World Green Building Council [WGBC] 2017). As a result, urban planning practices and regulation of the construction sector are not always consistent or effective.

### **HOW PLANNING AND DESIGN FRAME ACTION ALONG THE CONSTRUCTION VALUE CHAIN**

The discussions of the workshop focused on how planning and design influence the construction value chain. Through the discussion a number of enablers, challenges and gaps that exist at these stages were identified.

#### **Opportunities & enablers**

- It is important to start looking at infrastructure as a system. It is not just an asset, but a part of a system of three components - assets, knowledge, and institutions, where the latter two act as an enabling environment. The system-based approach can help countries transition to a more sustainable and resilient infrastructure development paradigm.
- Right construction and material choices are an important element when aiming to reduce resource use and improve environmental impacts. Using local construction materials and techniques, where possible, helps to create low-cost, low-energy, low-waste and easy-to-repair buildings.
- Using local materials and techniques further supports local suppliers and, as a result, has a positive social and economic impact locally.
- Governments have an opportunity to adopt and encourage successful pilot methodologies promoting local innovative solutions within their policies and legislation that can be further implemented for larger construction projects.
- Various incentives, e.g., tax incentives, for large corporations to invest into social housing can be an opportunity to promote sustainable design practices.



- A law for climate declaration for all constructions offers an opportunity to improve knowledge and gather needed data to assess further steps to reduce negative environmental impacts, as well as to include limit values on climate impact.
- There is a need for a tool providing quantitative data, especially in developing countries, to enable governments/architects to choose materials that create positive social and environmental impacts.
- Adding sustainability related targets to the design process, such as carbon, energy and water targets is an important step to ensure improved sustainability across the construction value chain. Understanding material ingredients is more important now, and low carbon and low chemical materials are one of the solutions.
- Decarbonization has to be done along the whole construction value chain, so that it takes into consideration operation and end-of-life of a building as well, not only within the manufacturer of the product or material. It is very important re-use at the end-of-life, rather than just recycle, in order to save the materials to be used in other constructions. Decision on what will happen with these materials needs to be planned for during the design stage. The carbon footprint due to circularity of the process will be significantly reduced, and less new materials will be needed.
- Transportation also causes significant environmental footprint, so using local material is recommended, but not always possible. By re-using the whole building, transportation costs are also eliminated.
- Soil-stabilised brick or compressed brick, a technology that has been around for many years but never industrialized, can lead to affordable resource-efficient housing.
- Setting up mobile brick plants in rural areas enables brick production close to the construction sites and thus minimizes transport costs.
- 3D printing can be a time saving, more affordable and sustainable solution for certain constructions.
- Depending on the location, use of compressed earth technologies can act as a catalyst for local development.

### Challenges & gaps

- In some countries, there is no land use policy, existing land use plan/building codes and standards are outdated, what can lead to an unplanned and illegal construction development.
- Depending on a country, not all construction projects have building construction certificates and needed inspection are not carried out due to lack of resources. To address such challenges, there is a need to develop a technical assistance action plan, focused on individual competencies/skills, as well as processes.
- New technology and new materials are not always easy for the market to start using them due to lack of skills of the workers. There is a gap in the knowledge needed for the implementation of new solutions.
- There is a need to get a better understanding of how low-income families build housing, which is often incremental and self-managed. With limited access to funding, quality products, services, and skills, there is a need to support them with affordable, durable, disaster resilient and easy to repair solutions.
- Developing countries need more construction, what means more materials will be needed. Therefore, to improve resource efficiency of the construction sector, dematerialization is an



important opportunity, as simple architectural designs have significant impacts on resource efficiency and CO2 levels.

- There is a gap in information regarding carbon footprint of building materials (except for the cement industry). There is a need to create an information system/resource banks that will collect primary data of different materials, e.g., from material passports.
- Many of the decisions that have large environmental long-term impacts are made long before architects come to the scene. Questions on site acquisition, functional programme, size of the building, why there's a need of a new building instead of using or making and addition to an existing one, etc., need to be answered before the design process starts.
- Commercial buildings are seen as investments, sometimes short term. The initial investor might not consider the life cycle of their building as a relevant factor, as they might want to sell their building after a few years. Government regulations might be needed to ensure a life cycle perspective.
- In some countries, the majority of material vendors that have a chemical ingredients disclosure are those with imported materials from highly known brands. Some certification systems might unintentionally promote imported accredited material with good data, rather than local materials that may be better, but have no or poor data and accreditation. One approach could therefore be to go back to basics and focus on using natural materials, such as bio-based simple local materials that create local benefits.
- There is a lack of data from socio-economic perspective. There is a need for a different approach in order to meet the SDGs around decent jobs, education etc. Governments should be developing construction programmes addressing housing gaps while taking both direct and indirect impacts into considerations, e.g., through 5 Es: Economic, Educational, Equity, Environmental, Emotional aspects.
- Finding market mechanisms that help scale up pilot projects remains a challenge, as replicating a pilot project does not necessarily mean scale will be reached. Scale is more complex and needs a systemic change, including affordable mortgages, government pushing for green solutions, architects adapting sustainable solutions, etc.
- Planning and design have a tremendous impact on how and how long the building is used. However, architects or planners do not have responsibilities within the operation stage of the value chain. Feedback on performance, maintenance, changes in the buildings, or user experience is missing in order to improve resource efficiency and environmental impacts of the whole value chain.

#### LIST OF INITIATIVES SHARED AT THE WORKSHOP

- [3D House Printing](#), 14Trees
- [Testing BAMB results through prototyping and pilot projects](#), Buildings as Material Banks (BAMB)
- [Regulation on climate declarations for buildings](#), Boverket, Sweden
- [Sheltertech, a platform for affordable housing innovation, advancing entrepreneurial housing solutions that radically improve the lives of low-income families](#), Habitat for Humanity
- [Sustainable Building Material Index \(SBMI\)](#)



- [Chemicals of Concern in the Building and Construction Sector](#), UNEP
- [Sustainable Social Housing Initiative \(SUSHI\)](#), UNEP
- [The Capacity Assessment Tool for Infrastructure \(CAT-I\)](#), UNOPS
- [The reconversion of the Brussels former military barracks in a resilient, mixed and socially integrated neighbourhood](#), Usquare

### LIST OF ATTENDEES

	Organisation	Expert's name
1	14Trees, Holcim Group	Francois Perrot
2	Action Sustainability	Helen Carter
3	Alliance for an Energy Efficient Economy (AEEE)	Aafsha Kansal
4	Atelier Conception Patrimoine	Amélie Essesse
5	BUUR (Sweco)	Teodora Capelle
6	China Environmental United Certification Center	Jing Wang
7	Circular Berlin	Dina Padalkina
8	Costa Rica - Ministerio de Vivienda y Asentamientos Humanos	Christian Escobar Barquero
9	Ecuador - Ministerio Ambiente, Agua y Transición Ecológica	Estuardo Jaramillo
10	Ecuador - Ministerio Ambiente, Agua y Transición Ecológica	Mayra Herrera Jaramillo
11	Environmental Design Solutions (EDS)	Nidhi Gupta
12	Gauge	Jeremy Gibberd
13	Green Building Council Mauritius	Tony Lee
14	Hilti Foundation	Johann Baar
15	iisBE (International Initiative for a Sustainable Built Environment)	Nils Larsson
16	International Finance Corporation	Ayesha Malik
17	International Resource Panel	Maria Jose Baptista
18	ISCTE - University Institute of Lisbon	Ricardo Costa Agarez
19	Low Carbon Cementitious Materials Initiative (LCCI)	Vanderlay M. John
20	Mass Design	James Kitchin
21	Mindful Materials	Annie Bevan
22	Ministry of Rural Development and Local Government - Trinidad and Tobago	Nadine David-Figaro
23	Paraguay - Secretaría de Defensa del Consumidor y el Usuario (SEDECO)	Hector Corrales
24	Skidmore Owings and Merrill (SOM)	Mina Hasman
25	Slovak Environment Agency	Tatiana Gušťaříkova
26	Swedish Environmental Protection Agency	Asa Ekberg Osterdahl
27	Tamil Nadu Shelter Fund	Vivek Sharma
28	Tamil Nadu Shelter Fund	Vidhyabharathi Balasubramaniam



29	Trinidad and Tobago - Ministry of Rural Development and Local Government	Madho Balroop
30	UN-Habitat	Alicia Regodon
31	UNEP	Amelie Ritscher
32	UNEP	Kei Ohno Woodall
33	UNEP, OzonAction	Ayman Eltalouny
34	University of Bradford	Crina Oltean-Dumbrava
35	University of Northampton	Haithan Askar
36	UNOPS	Apoorva Bajpai
37	UNOPS	Samantha Stratton-Short
38	Venezuelan Council for Sustainable Construction (CVCS)	Jose Solano
39	10YFP Secretariat	Andrew Schmidt
40	10YFP Secretariat	Branislav Mizenko
41	10YFP Secretariat	Charles Arden-Clarke
42	10YFP Secretariat	Elena Giordano
43	10YFP Secretariat	Gina Torregroza
44	10YFP Secretariat	Yulia Rubleva