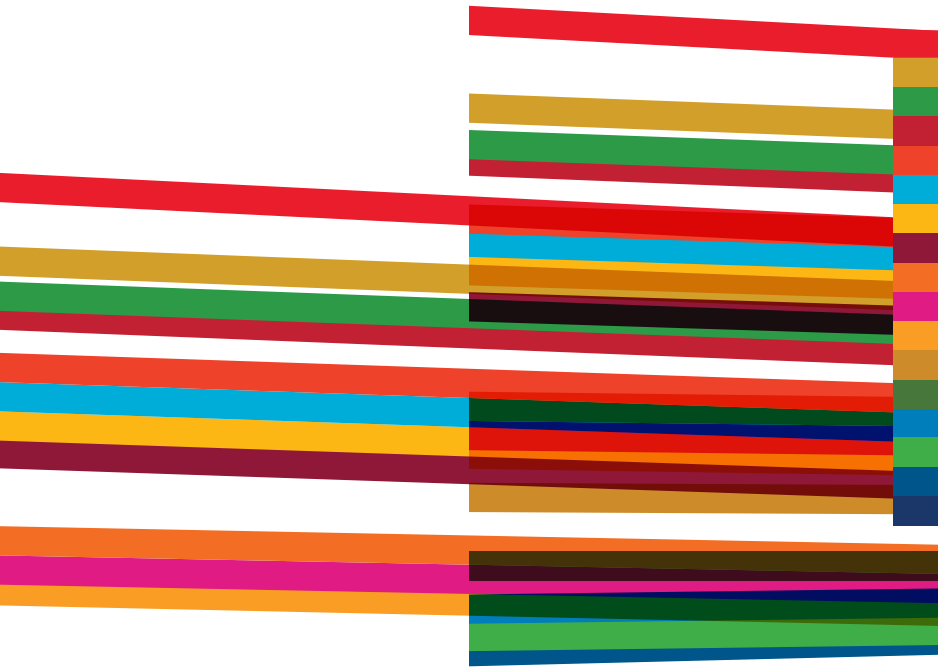
AN ARCHITECTURE GUIDE
to the UN 17 Sustainable Development Goals
Volume 2



THE 17 GOALS

In 2015, world leaders agreed to 17 goals for a better world by 2030. These goals have the power to end poverty, fight inequality and stop climate change. Guided by the goals, it is now up to all of us, governments, businesses, civil society and the general public to work together to build a better future for everyone. **https://www.globalgoals.org/**

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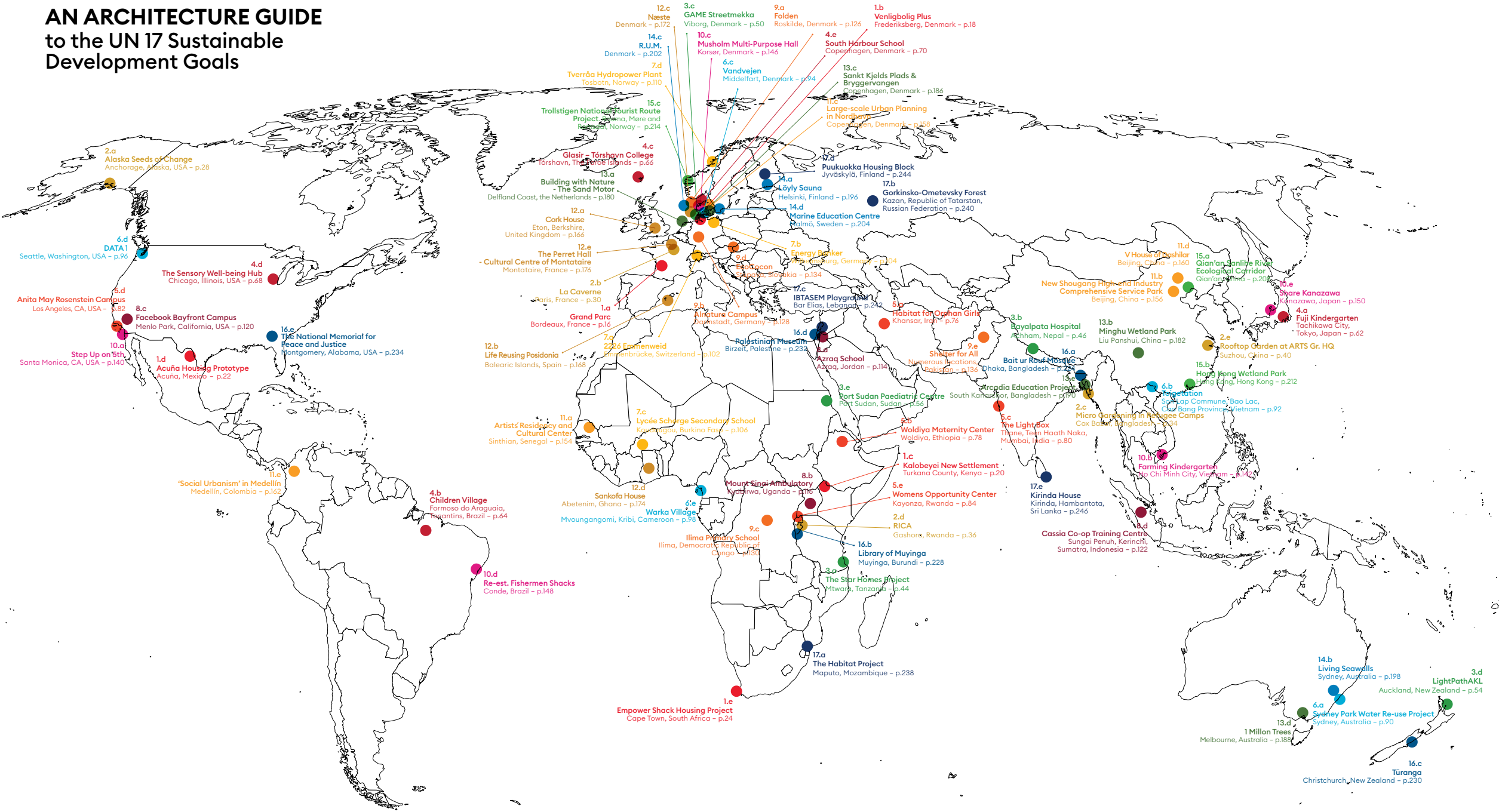

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Ensure sustainable consumption and production patterns

Sustainable consumption and production is about promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all. Its implementation helps to achieve overall development plans, reduce future economic, environmental and social costs, strengthen economic competitiveness and reduce poverty.

Worldwide material consumption has expanded rapidly, as has material footprint per capita, seriously jeopardising the achievement of Sustainable Development Goal 12 and the Goals more broadly. Urgent action is needed to ensure that current material needs do not lead to the overextraction of resources or to the degradation of environmental resources, and should include policies that improve resource efficiency, reduce waste and mainstream sustainability practices across all sectors of the economy.[1]

To find out more about Goal #12, visit:
https://www.un.org/sustainabledevelopment/sustainable-consumption-production

[1] Extract from UN's Sustainability Goals, available from https://sustainabledevelopment.un.org/sdg12

The building industry is a major consumer of natural resources and contributor to waste.

When buildings are demolished, most of the value of existing materials and components are lost. The same applies to renovations, which transform vast amounts of already extracted and treated materials into waste. Even the process of constructing new buildings is producing waste; from cut-off bits of gypsum board over discarded formwork and the wrapping that components are delivered in, to materials damaged by weather or mistreatment.

Designing for long lifetime, steady maintenance and keeping what we already have, by careful adaptation of existing buildings, are keys to sustainable consumption in the built environment. Design considerations for durability and life cycles can reduce the value loss and waste production in the building industry and in individual components, buildings and structures. Ideally, the design of buildings allows them to transform into different uses over time so that the materials and other resources invested in the structure retain their value even when a given use changes or becomes obsolete. Additionally, individual components and materials should be designed and employed so that they can be recycled and upcycled.

Design and construction of new buildings must give priority to reducing the amount of material resources employed and waste produced. New architectural solutions and components must be developed that significantly reduce the use of resources overall, significantly limit the use of non-renewable natural resources and emphasise the use and reuse of local materials.

Cork House

Eton, Berkshire, United Kingdom

Origin/team
Matthew Barnett Howland with Dido Milne (CSK Architects) and Oliver Wilton (UCL)

Challenge

Buildings and construction account for almost 40% of energy-related carbon emissions. Close to a third of those are embodied in building materials. If we are to reach the targets set for 2030, we need to address the question of embodied carbon and view buildings in a whole-life perspective.[1] We need comprehensive methods to calculate the total impact of buildings, but we also need innovation and experimentation with the materials we use and the way we use them.

Contribution

Cork House is the first of its kind, with monolithic walls and corbelled roof pyramids made almost entirely from solid load-bearing cork. Its distinctive structural form and atmospheric spaces are the result of a whole-life approach to environmental sustainability. Conceived as a kit-of-parts and designed for disassembly, components are prefabricated off-site and assembled by hand on-site without mortar or glue. With a focus on the solid, simple and sustainable, the project is an inventive response to the complexities and conventions of modern house construction. Instead of the typically complex, layered building envelope that incorporates an array of building materials, products and specialist sub-systems, the Cork House is an attempt to make solid walls and roofs from a single bio-renewable material. This highly innovative form of plant-based construction has resulted in a building that is carbon negative at completion with extremely low whole-life carbon of 619kgCO_2e/m^2 (as per British Standard BS EN 15978).

Expanded cork is a pure plant-based material made with by-product from cork forestry. The bark of the cork oak is harvested by hand every nine years without harming the tree. This gentle form of agroforestry is widely recognised to contribute to a rich, biodiverse ecosystem. In the architect's words, Cork House is a case study of a holistic attempt to reconcile human habitation with natural resource systems.

Photos: Barnett Howland

ARCHITECTS' CALL FOR ACTION

The UN 17 Sustainable Development Goals represent the commitment of the people of the United Nations for a more sustainable future. Architecture and the built environment are part of the current problems but also vital to the solutions we need in order to accomplish the Goals. This book is the second volume of an architecture guide to the Goals. The 17 chapters present the Goals as defined by the UN, outline how each goal interacts with the built environment and give examples of real projects that illustrate how architecture can contribute.