

CONNECTED DIGITAL ECOSYSTEMS

TRANSFORMING DESIGN APPROACHES FOR UNDERSTANDING URBAN MICROCLIMATES

OVERVIEW

To date, the built environment industry has concentrated efforts on developing sustainable design strategies for reducing building energy consumption and carbon emissions. However, as research moves towards an understanding of complex integrated systems that incorporate social and ecological aspects of sustainability. The direct impact on these aspects by the building and construction sector is driving the transition from sustainable design to regenerative design. Since regenerative design seeks to build a symbiotic relationship between humans and natural systems through the continuous renewal of evolving socio-ecological systems, more integrated approaches, tools and metrics are vital to meet this goal.

PROJECT OBJECTIVES

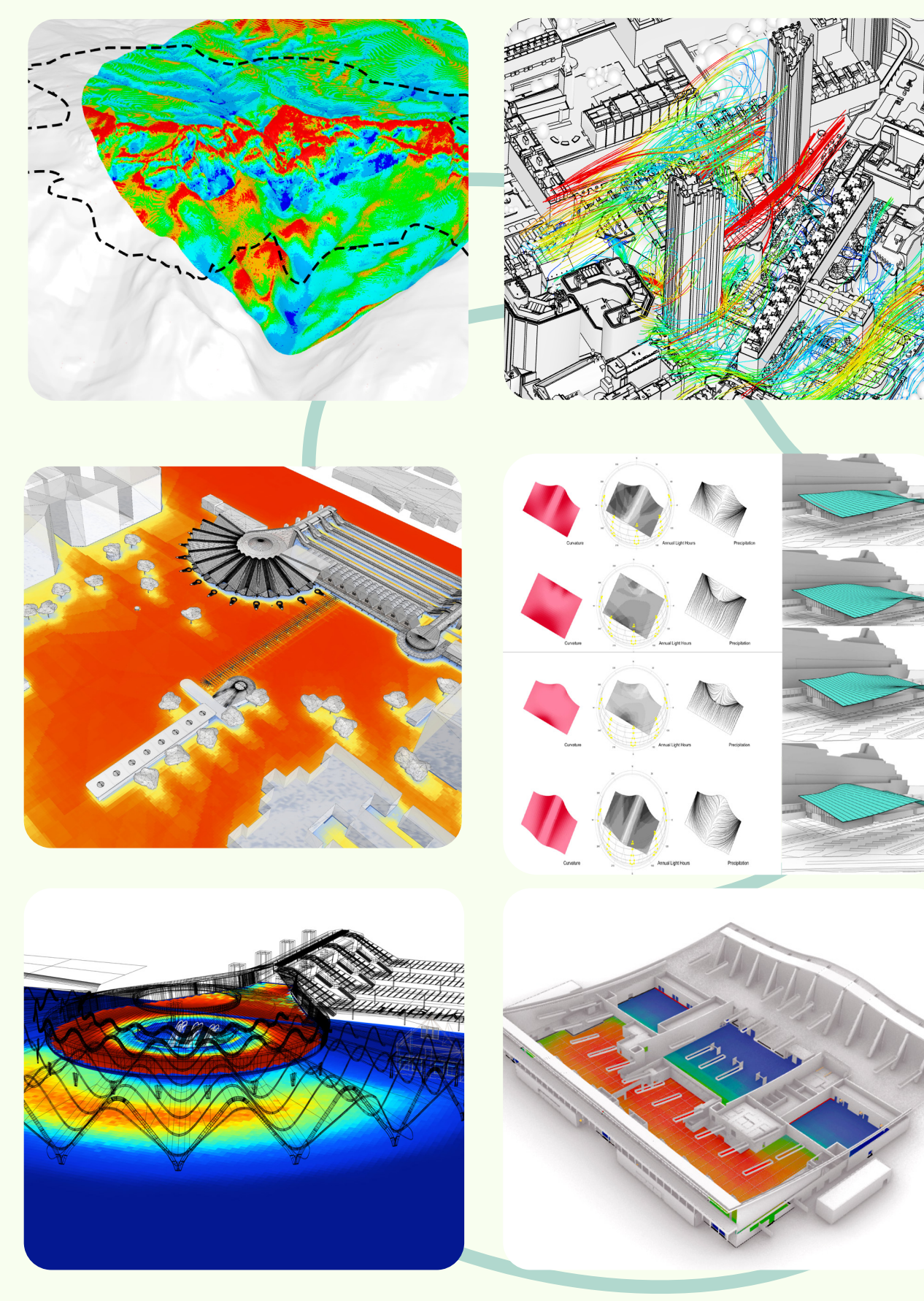
At Atkins, we have developed an approach to microclimate analysis to support regenerative design in urban design and masterplanning. Our approach supports a holistic view of the climate system to create sustainable living conditions in a constantly changing environment. This approach is supported by our digital tool ecosystem; the Atkins' "Digital Daisy Chain". This ecosystem provides the mechanism for connected design analysis and insight, allowing designers to explore the microclimate and its relationship to human comfort, building performance, green infrastructure, and biodiversity outcomes. It also enables the incorporation of novel software applications, like Speckle and SimScale, into design decision-making processes. The ecosystem leverages existing and familiar software systems and integrates cutting edge technology to transform traditional approaches to design.

TOOLS CONNECTIVITY

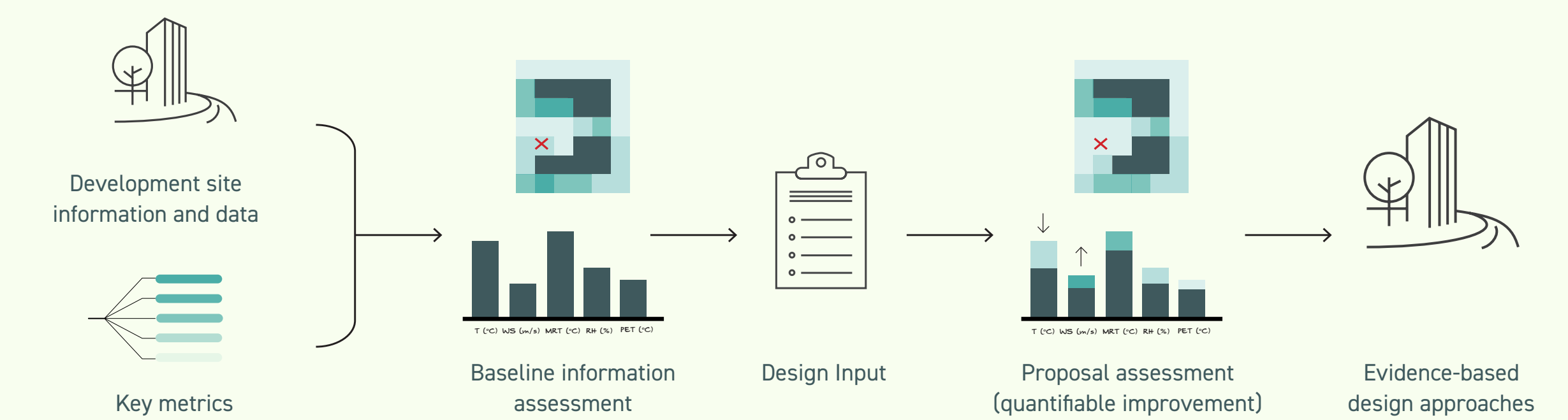
- Industry recognised tools
- Bespoke scripting
- Internally developed analysis tools.

CONCLUSION

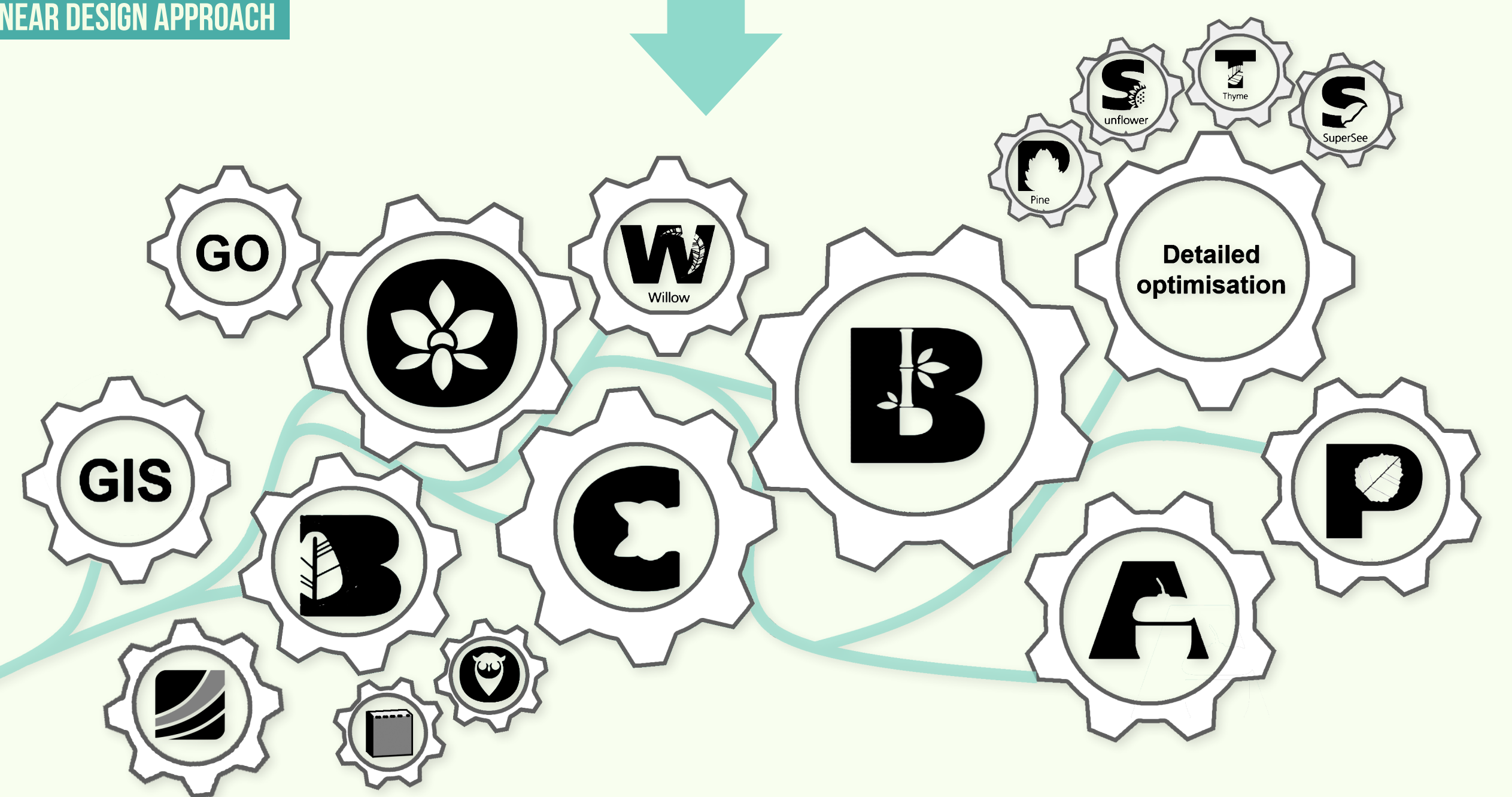
Our microclimate approach and Digital Daisy Chain is based on the concept of urban environments being a coupled system in which diverse parameters interrelate. This provides a deep understanding of the microclimate at a neighbourhood or city level to support decision-makers to engage with real-life problems at all scales. The implementation of connected digital tools aid in understanding the relationship among buildings, the surrounding context and microclimate. Such holistic, data-driven, and renewal-focused perspectives are central to the development and design of places that promote planetary health, human wellbeing, comfort, and enjoyment.



CASE STUDY EXAMPLES

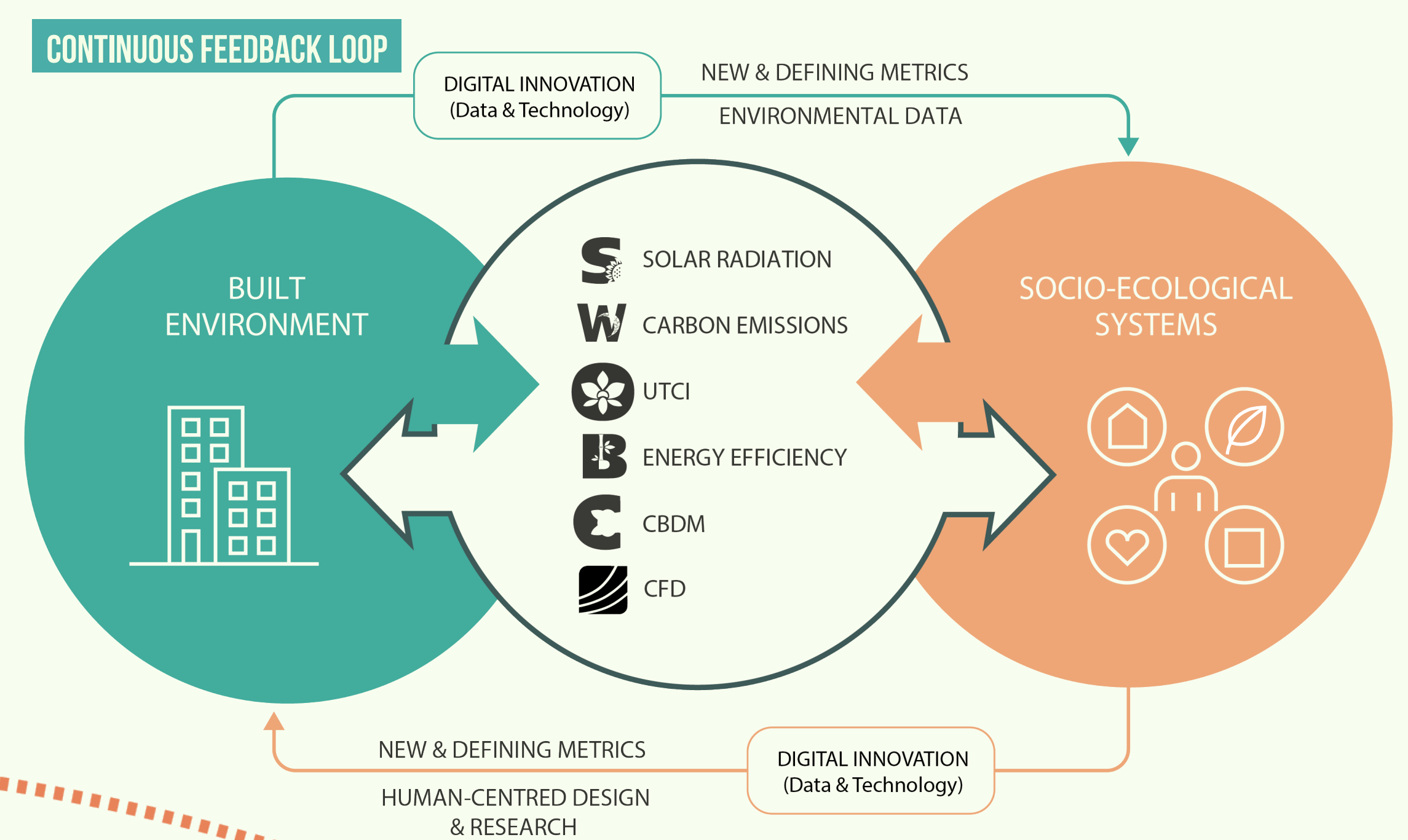


LINEAR DESIGN APPROACH



"DIGITAL DAISY CHAIN" ECOSYSTEM provides the mechanism for connected design insight.

It is an ecosystem of in-house holistic design tools that allows different types of software, analysis and tools to communicate from one platform to another, supporting the whole project lifecycle.



URBAN HEAT ISLAND EFFECT

URBAN ENVIRONMENT COMPLEXITY

