Optimising the Optimisers: Sustainability Science and Australian Architects

UN environment programme

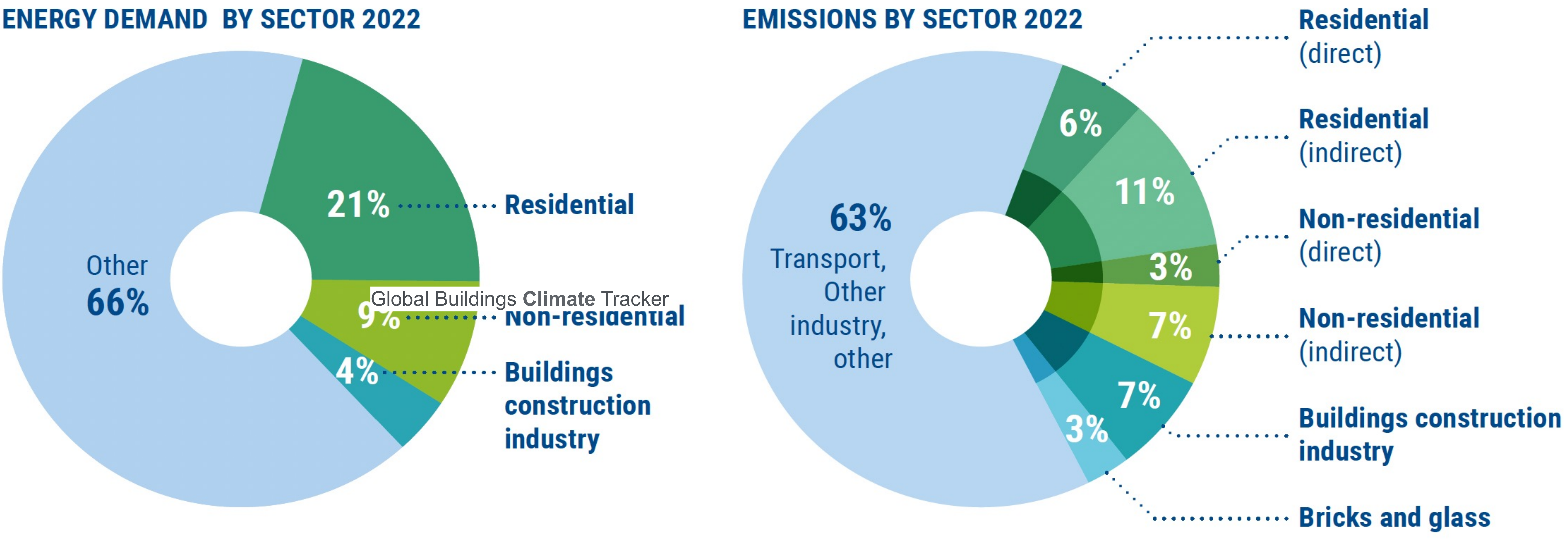
Beyond foundations

Mainstreaming sustainable solutions to cut emissions from the buildings sector

Global Alliance for Buildings and Construction

Global Status Report for **Buildings and Construction**

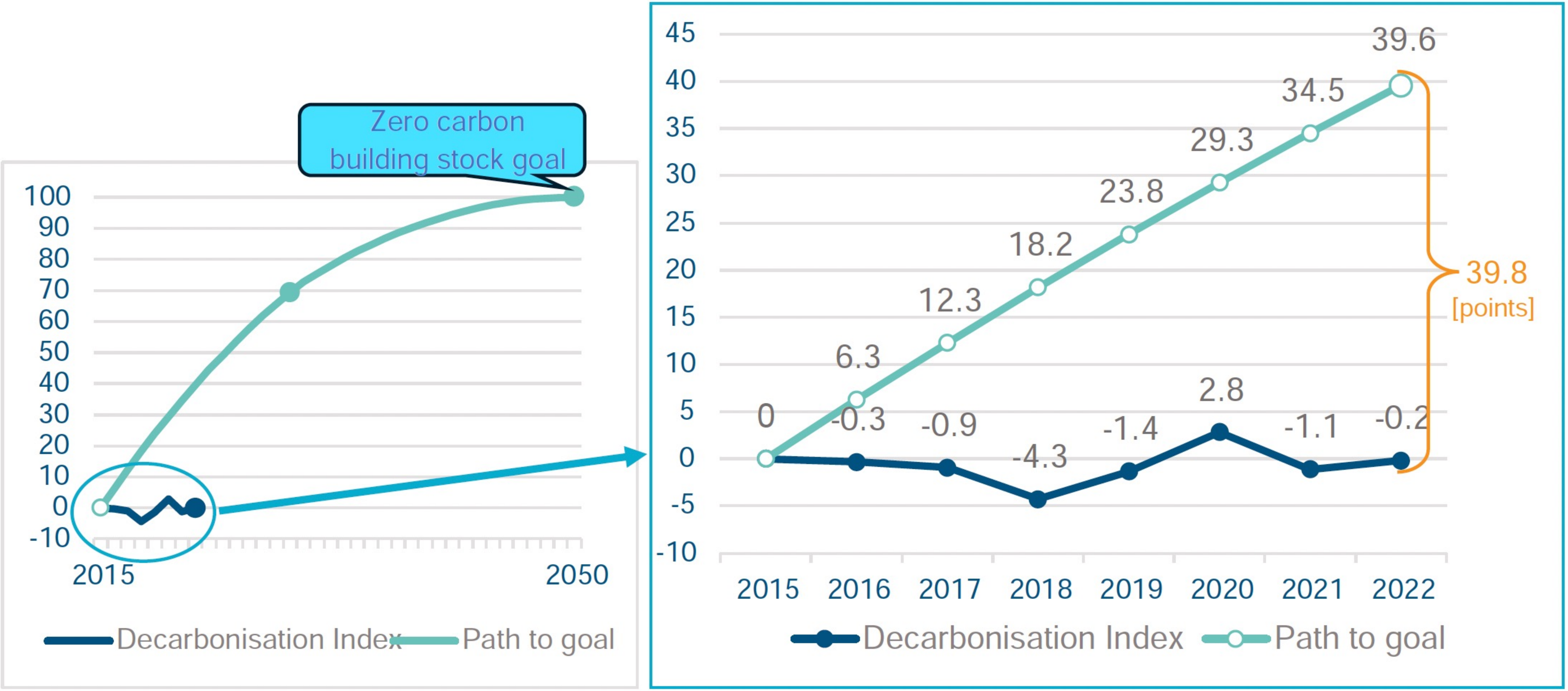
Figure 1 Share of buildings in total final energy consumptions in 2022 (left) and share of buildings in global energy and process emissions in 2022 (right)



(Source: IEA 2023a. Adapted from 'Tracking Clean Energy Progress')

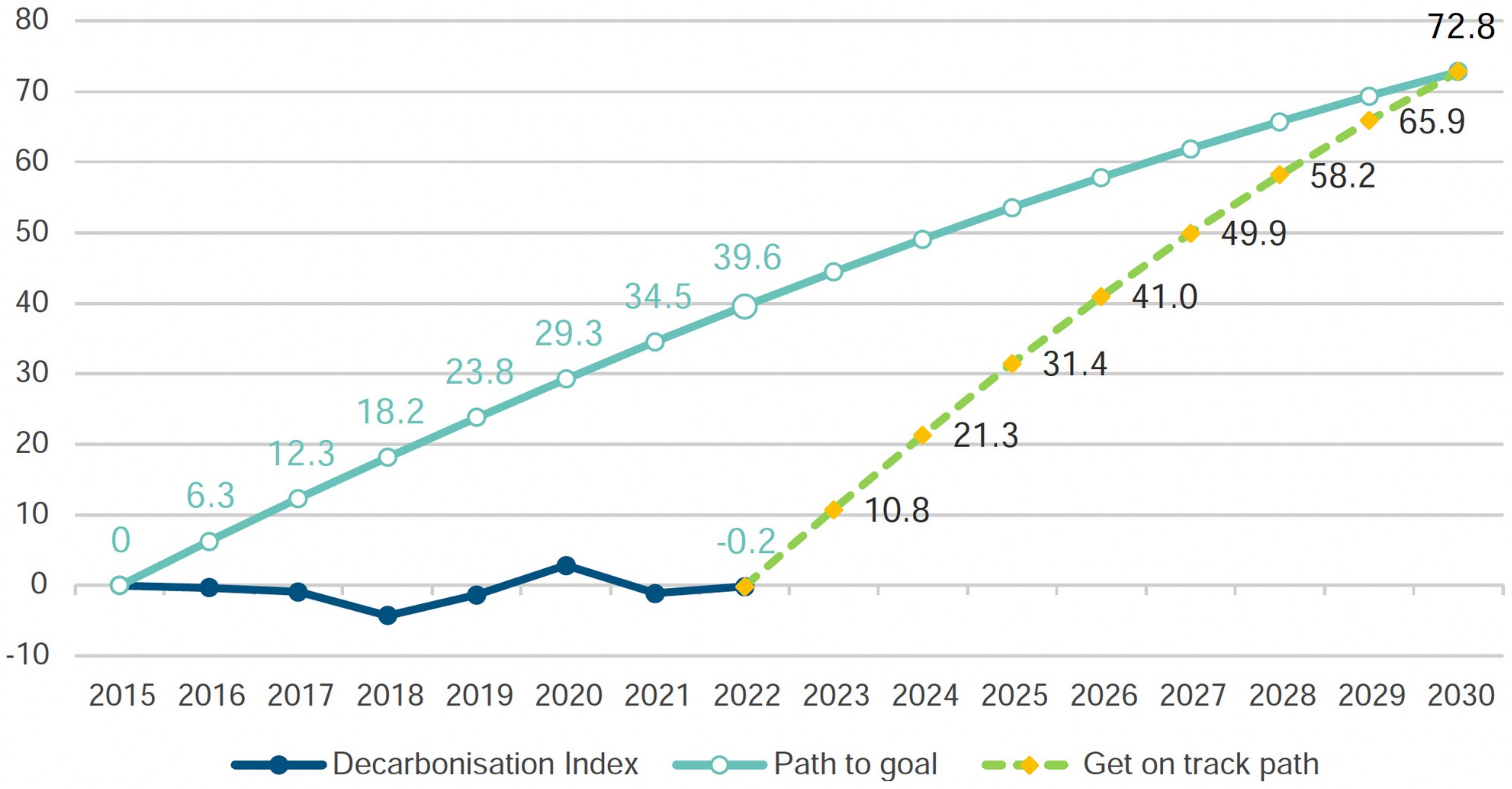
Notes: Buildings construction industry refers to materials used in construction, including concrete, steel and aluminium. Other materials shown separately.

Figure 3 GBCT decarbonisation index. Left: Reference path until 2050. Right: Zoom in for the 2015-2022 period



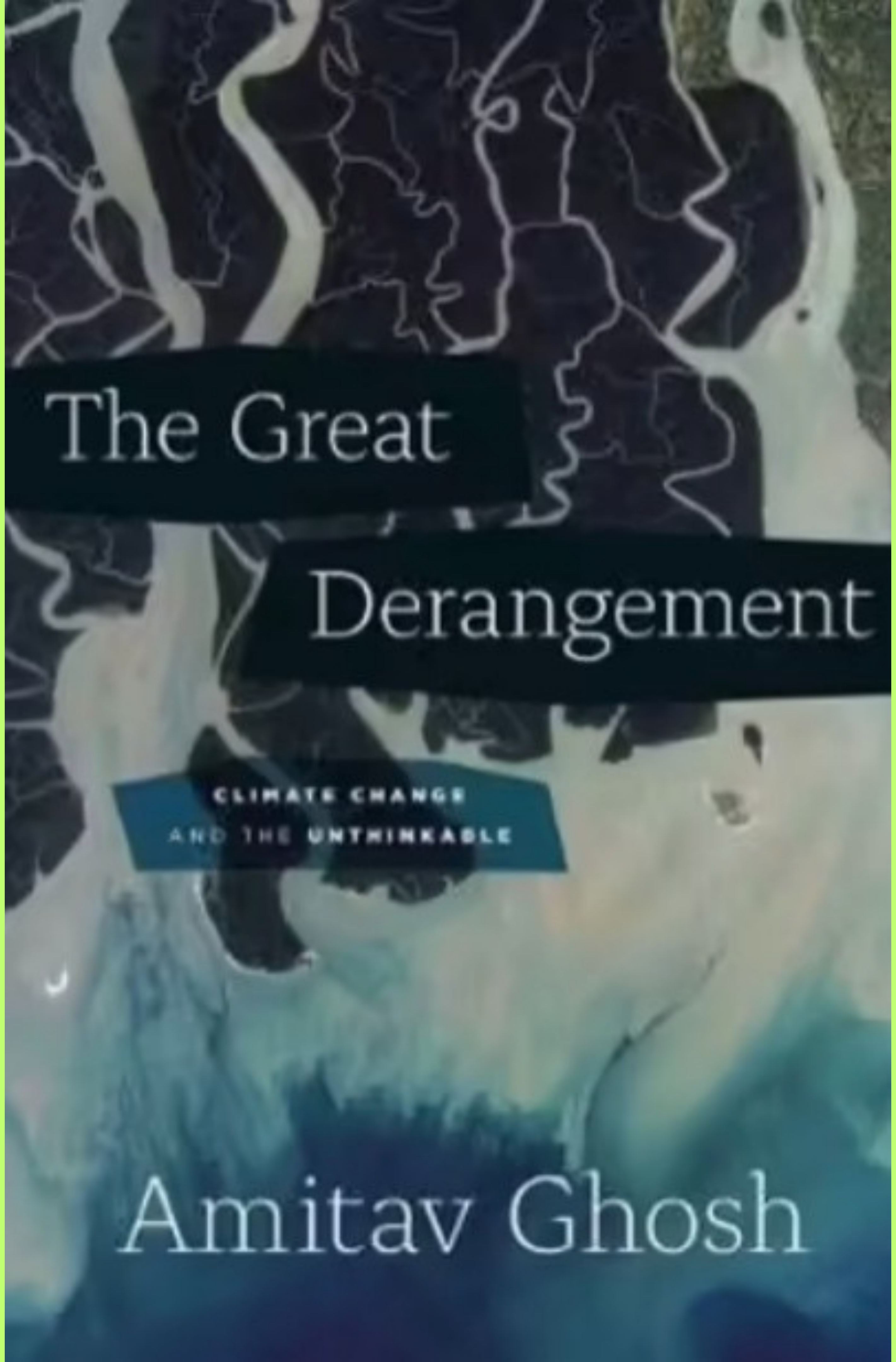
(Source: BPIE)

Figure 17 GBCT observations and path to get on track by 2030



(Source: BPIE)

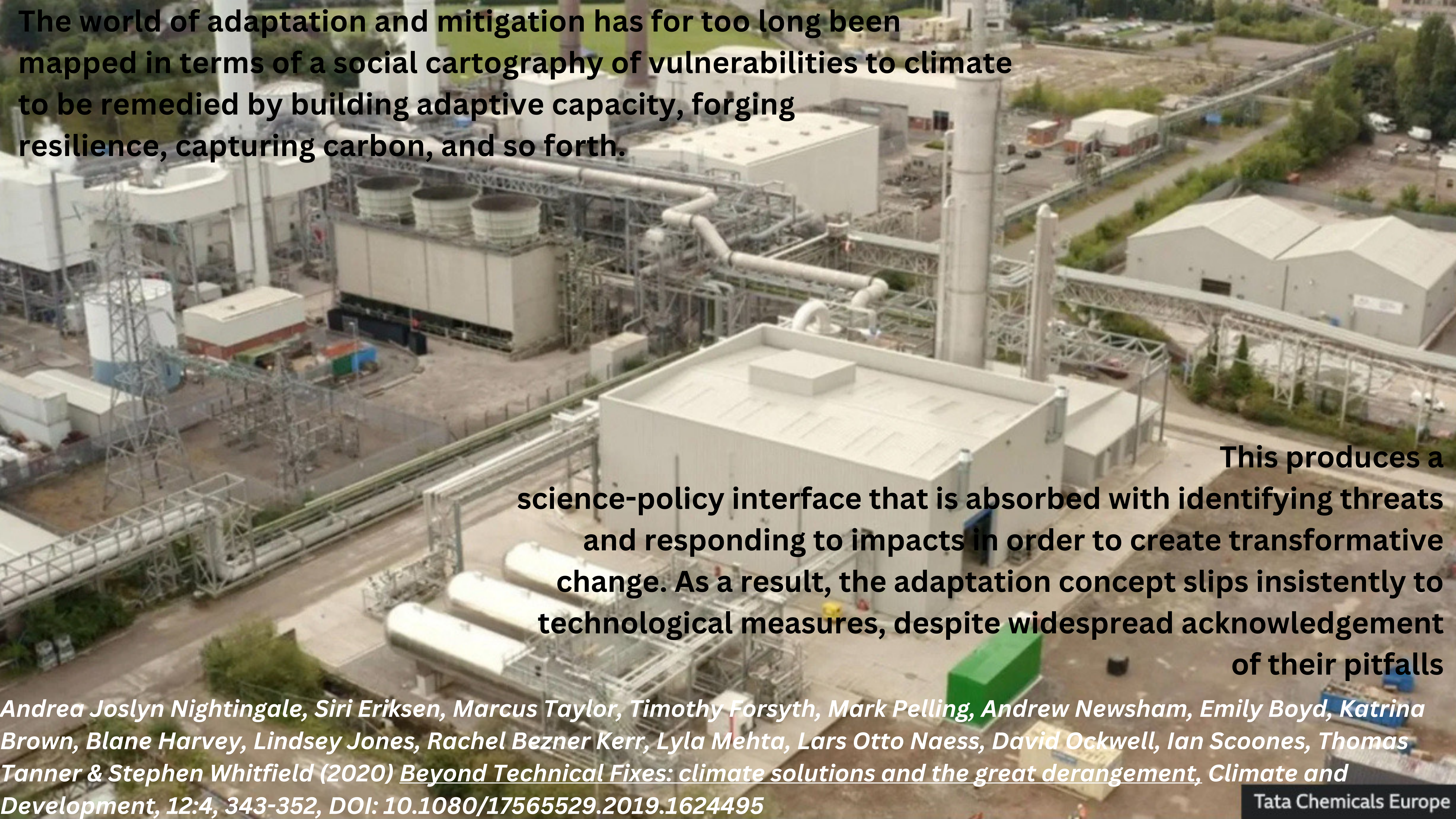
This Great Derangement is founded upon a dualistic conceptualization of the world in which social and environmental processes are conceived as separate yet interacting forces, pointing towards a set of largely technical solutions for policy and practice.



Beyond Technical Fixes: climate solutions and the great derangement

Climate and Development, 12:4, 343-352, (2020) DOI: 10.1080/17565529.2019.1624495

Andrea Joslyn Nightingale, Siri Eriksen, Marcus Taylor, Timothy Forsyth, Mark Pelling, Andrew Newsham, Emily Boyd, Katrina Brown, Blane Harvey, Lindsey Jones, Rachel Bezner Kerr, Lyla Mehta, Lars Otto Naess, David Ockwell, Ian Scoones, Thomas Tanner & Stephen Whitfield



The world of adaptation and mitigation has for too long been mapped in terms of a social cartography of vulnerabilities to climate to be remedied by building adaptive capacity, forging resilience, capturing carbon, and so forth.

This produces a science-policy interface that is absorbed with identifying threats and responding to impacts in order to create transformative change. As a result, the adaptation concept slips insistently to technological measures, despite widespread acknowledgement of their pitfalls

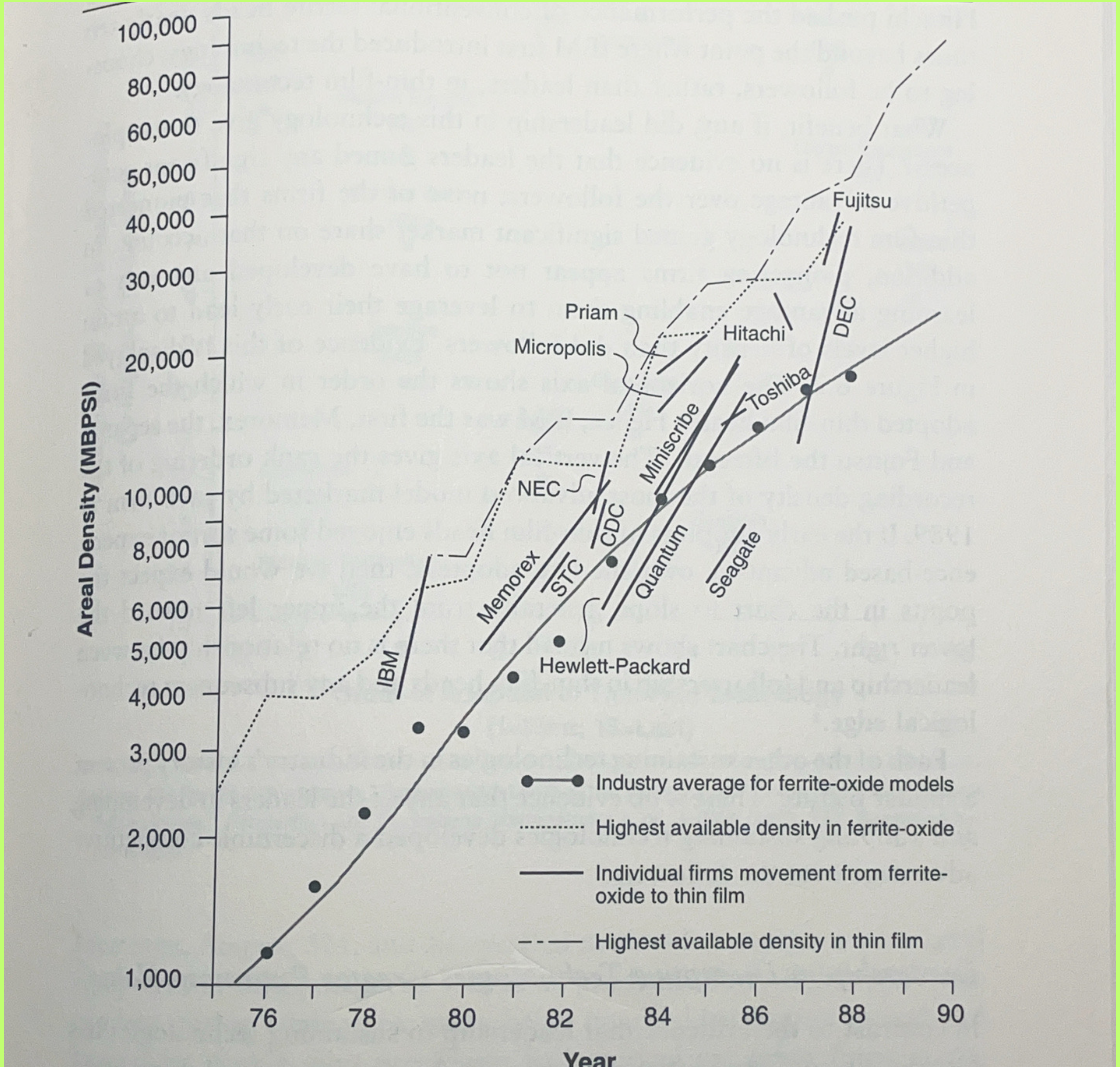
Andrea Joslyn Nightingale, Siri Eriksen, Marcus Taylor, Timothy Forsyth, Mark Pelling, Andrew Newsham, Emily Boyd, Katrina Brown, Blane Harvey, Lindsey Jones, Rachel Bezner Kerr, Lyla Mehta, Lars Otto Naess, David Ockwell, Ian Scoones, Thomas Tanner & Stephen Whitfield (2020) Beyond Technical Fixes: climate solutions and the great derangement, Climate and Development, 12:4, 343-352, DOI: 10.1080/17565529.2019.1624495

The technical innovations of architects seek to reconcile the biological and the physical. These are produced in two primary ways:
Firstly, through the biophysical imaginaries of unbuilt and seemingly utopian projects.

Secondly in those actual projects where real biophysical changes are expressed through various attempts at design and construction innovations.

“The risk is very high that any particular idea about the product attributes or market applications of a disruptive technology may not prove to be viable. Failure and iterative learning are, therefore, intrinsic to the search for success with a disruptive technology.”

Christensen, C. M. (2013). The innovator's dilemma: when new technologies cause great firms to fail. Harvard Business Review Press.



Both of these technical narratives anticipate a future perfect anthropocene in climatic equilibrium, arguably a erroneous, if not dangerous, misreading of the physical science of IPCC's AR6.

The NSCA in 2015 included a "Sustainable Environment Domain.": "Understanding the responsibility of architects to minimise the impact on natural resources and design for longevity."

	On graduation from an architecture program — a graduate will	At the point of registration — a candidate will	Post registration — an architect will
PC 1	Understand the regulatory requirements and obligations pertaining to practice as an architect, including professional codes of conduct and obligations for continuing professional development and professional indemnity insurance.	Demonstrate understanding of the regulatory requirements and obligations pertaining to practice as an architect, including legislation, professional codes of conduct, and obligations for continuing professional development and professional indemnity insurance.	Comply with the regulatory requirements and obligations pertaining to practice as an architect, including legislation, professional codes of conduct, obligations for continuing professional development and professional indemnity insurance.
PC 2	Understand the role of quality assurance systems in facilitating efficient and timely delivery of architectural services.	Be able to identify practice resources and apply practice methods and quality assurance systems within an ethical practice management framework to comply with and facilitate efficient, consistent and timely delivery of architectural services.	Implement practice resources and apply ethical employment practice methods and quality assurance systems to facilitate efficient, consistent and timely delivery of architectural services.
PC 3	Understand the principles of project planning, considering implications for Country, environmental sustainability, communities, stakeholders and project costs.	Demonstrate understanding of the principles of project planning, considering implications for Country, environmental sustainability, communities, stakeholders and project costs.	Apply principles of project planning, considering implications for Country, environmental sustainability, communities, stakeholders and project costs.
PC 4		Be able to apply principles of project and staff planning and resource costs to establish realistic and achievable timeframes.	
PC 5	Understand the essential elements of a client architect agreement, across the range of procurement methods and the different scales and types of project.	Demonstrate understanding of the essential elements of a client architect agreement across the range of procurement methods; and be able to explain appropriateness of different agreements in relation to scale and type of project, including alternatives for partial services and the engagement of secondary and sub-consultants.	Be able to apply essential elements of a client architect agreement across the range of procurement methods in relation to their appropriateness to the scale and type of the project, including alternatives for partial services and the engagement of secondary and sub-consultants.
PC 6	Understand appropriate processes for reporting and varying the scope of services provided by an architect.	Demonstrate understanding of appropriate processes for reporting and varying the scope of services provided by an architect.	Be able to apply appropriate processes for reporting and varying the scope of services provided by an architect.
PC 7	Understand appropriate processes for clear and consistent communication with clients and relevant stakeholders throughout a project, including obtaining approvals from clients and stakeholders.	Apply and follow processes for clear and consistent communication with clients and relevant stakeholders throughout the project, including obtaining approvals from clients and stakeholders.	
PC 8	Understand how to implement culturally responsive and meaningful engagement processes that respect the importance of Country and reciprocal relationships with Aboriginal and Torres Strait Islander Peoples across architectural services.	Be able to implement culturally responsive and meaningful engagement processes that respect the importance of Country and reciprocal relationships with Aboriginal and Torres Strait Islander Peoples across architectural services.	
PC 9	Understand contemporary and emerging building procurement methods. This involves identifying the most appropriate form of delivery for a project, including associated risks, mitigation and adaptation strategies, and understanding appropriate construction and consultant contracts and agreements.	Demonstrate understanding of contemporary and emerging building procurement methods. This involves identifying the most appropriate form of delivery for a project, including associated risks, mitigation and adaptation strategies, and integrating appropriate construction contracts and consultancy contracts and/or agreements.	Be able to apply contemporary and emerging building procurement methods. This involves identifying the most appropriate form of delivery for a project, including risks, mitigation and adaptation strategies, and integrating appropriate construction contracts and consultancy contracts and/or agreements.
PC 10	Understand the whole life carbon implications of procurement methods, materials, components and construction systems.	Demonstrate understanding of the whole life carbon implications of procurement methods, materials, components and construction systems.	
PC 11		Be able to assess, recommend and/or select an appropriate procurement process, with consideration for its impact on all phases of a project – including design, documentation and project delivery – and provide advice to the client in terms of the level of scope of service for consultants.	
PC 12	Understand how relevant building codes, standards and planning controls apply across architectural practice, including climate change implications, the principles of fire safety, and barriers to universal access.	Provide independent, culturally responsive and objective advice in accordance with relevant building codes, standards, technical specifications and guidelines, and planning regulations, including climate change implications, across all aspects of architectural practice.	
PC 13	Have knowledge of documentation processes that facilitate project delivery appropriate to selected procurement processes.	Be able to identify and apply strategies, programming and processes for documentation through all project stages to facilitate project delivery, as appropriate to selected procurement processes.	
PC 14		Be able to identify and apply construction services provisions and/or construction administration systems needed to fulfil all obligations appropriate to the procurement process in accordance with the terms of the agreement.	
PC 15	Understand legal and ethical obligations relating to copyright, moral rights, authorship of cultural knowledge and intellectual property requirements across architectural services.	Comply with legal and ethical obligations relating to legislated requirements in relation to copyright, moral rights, authorship of cultural knowledge and intellectual property requirements across architectural services.	
PC 16	Understand risk management and mitigation principles and strategies – including safety in design, project risk, requirement for resilience from the impacts of climate change and appropriate insurances – across architectural services.	Be able to apply risk management and mitigation strategies – including safety in design, project risk, requirement for resilience from the impacts of climate change and appropriate insurances – across architectural services.	

	On graduation from an architecture program — a graduate will	At the point of registration — a candidate will	Post registration — an architect will
PC 17	Have an understanding of Aboriginal and Torres Strait Islander Peoples' aspirations to care for Country and how these inform architectural design.		
PC 18	Be able to apply creative imagination, design precedents, research, emergent knowledge and critical evaluation in formulating and refining concept design options, including the exploration of three dimensional form and spatial quality.		
PC 19	Understand the purpose of project feasibility assessments, including research of site constraints, opportunities and risks, and methods of determining preliminary cost analysis.	Be able to identify, analyse and evaluate client project requirements and objectives using qualitative and quantitative methods and, where required by the terms of engagement, to assist cost estimators in determining project feasibility/viability.	
PC 20		Be able to assess project budget and timeframe against project requirements and objectives, relevant legislation, statutory planning requirements, building codes and standards.	
PC 21		Be able to apply project budgets, or work with quantity surveyor to establish project budgets, based upon understanding of cost planning, value management and factors influencing project cost relevant to the project type and scale.	
PC 22		Identify and manage risks arising from real or perceived conflict of interests.	
PC 23	Understand the purpose and process of generating a return brief for approval by the client and relevant stakeholders, including an awareness of the implications of non-compliance.	Be able to prepare a return brief for approval by the client and relevant stakeholders in response to a client brief and any areas of deviation or non-compliance.	
PC 24	Understand how to identify and evaluate project development options in response to a project brief – its objectives, budget, user intent and built purpose, risks and timeframe, including environmental sustainability considerations.	Be able to prepare and analyse project development options in response to a project brief – its objectives, budget, user intent and built purpose, risk and timeframes, including environmental sustainability considerations.	
PC 25	Be able to draw on knowledge from the history and theory of architecture as part of preliminary design research and when developing the conceptual design.		
PC 26	Be able to undertake site, cultural and contextual analysis as part of preliminary design research.		
PC 27	Understand how to embed the knowledge, worldviews and perspectives of Aboriginal and Torres Strait Islander Peoples, shared through engagement processes, into the conceptual design in a meaningful, respectful and appropriate way.		
PC 28	Be able to draw on knowledge from building sciences and technology, environmental sciences and behavioural and social sciences as part of preliminary design research and when developing the conceptual design to optimise the performance of the project.		
PC 29	Be able to develop and evaluate design options in terms of the heritage, cultural and community values embodied in the site, and in relation to project requirements.		
PC 30	Be able to explore options for siting a project, including integrating information and analysis of relevant cultural, social and economic factors.		
PC 31	Be able to identify, analyse and integrate information relevant to environmental sustainability – such as energy and water consumption, resources depletion, waste, embodied carbon and carbon emissions – over the lifecycle of a project.		
PC 32	Be able to apply planning principles and statutory planning requirements to the site and conceptual design of the project.		
PC 33	Be able to investigate, coordinate and integrate sustainable environmental systems – including water, thermal, lighting and acoustics – into the conceptual design.	Be able to investigate, coordinate and integrate sustainable environmental systems – including water, thermal, lighting and acoustics – in response to consultants' advice.	
PC 34	Be able to apply principles and methodologies for presenting conceptual design proposals and associated information to clients, stakeholders and communities, including using culturally responsive methods appropriate to different audiences.	Communicate conceptual design proposals and associated information to client, stakeholders and communities using appropriate and culturally responsive methods appropriate to different audiences	
PC 35	Understand the operational and embodied carbon implications of chosen materials, components and systems.	Be able to assess operational and embodied carbon implications of materials, components, construction systems and supply chains (including transport) to achieve net zero whole life carbon when developing design concepts. This includes integrating relevant consultant expertise and advising on the impact of chosen materials, components and systems on carbon outcomes.	

The Architectural Education and the Profession in Australia and New Zealand report of 2019: Sustainabilty (4.2) was ranked design below, Design Studio (4.8), Architetcural Technology (4.5), Design Communication(4.3), and Architectural History (4.3).

The 2021 AACA competencies specifically addressed issues related to care for Country and First Nations people “and expanded expectations in terms of sustainability, life cycle assessment and whole life carbon.”

PC 31

On graduation from an architecture program	At the point of registration	Post registration
Be able to identify, analyse and integrate information relevant to **environmental sustainability** – such as energy and water consumption, resources depletion, waste, embodied carbon and carbon emissions – over the life cycle of a project.		

Explanatory Notes

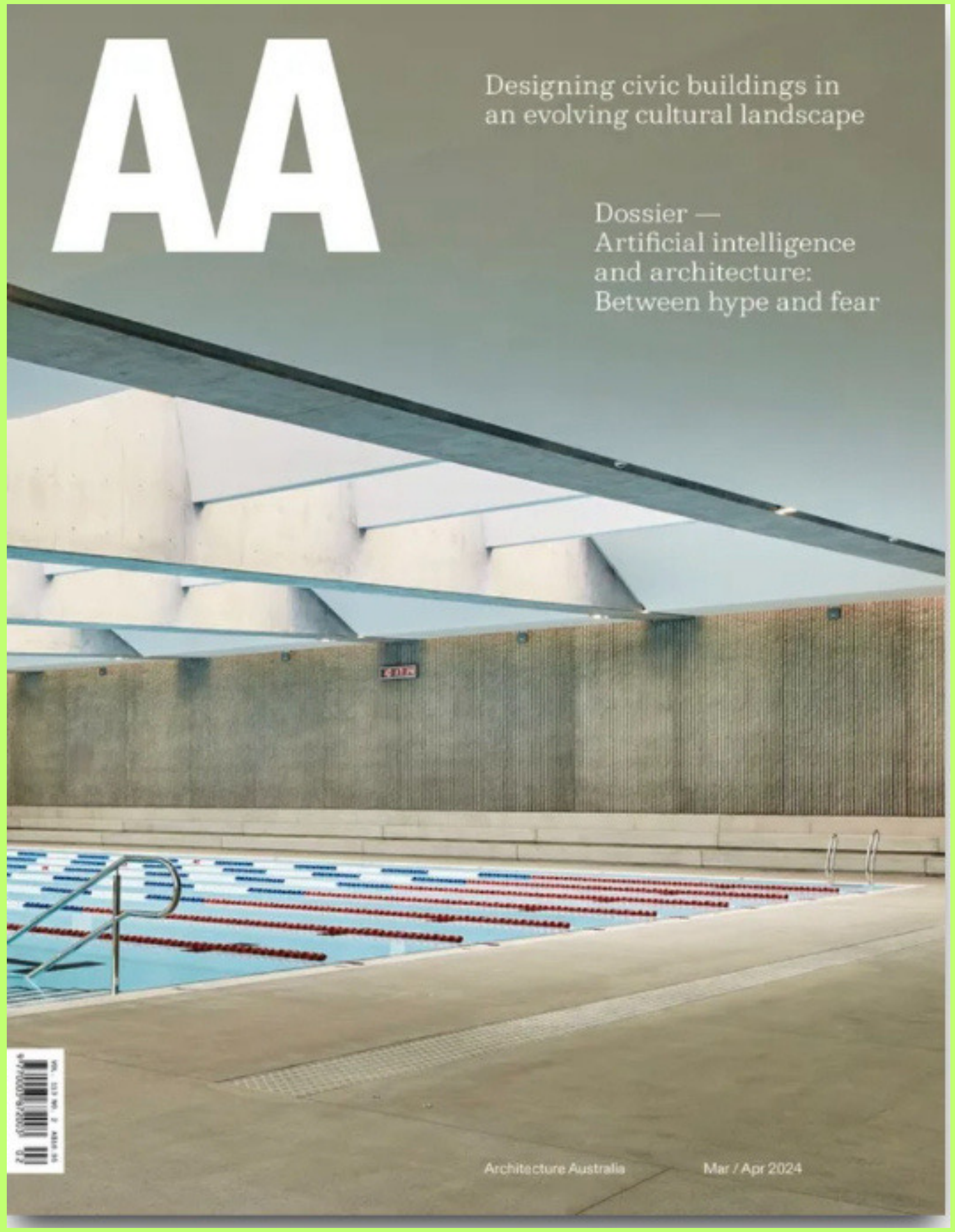
A **Whole Life Carbon** analysis informs environmental sustainability inputs for a project, and supports the evaluation and incorporation of environmentally sustainable passive design, materials selection, and services systems throughout the design process. Auditing the project against the WLC analysis at key project milestones provides insight into how the project is tracking against the environmental sustainability criteria and commitments.

Example

At graduation, registration and post registration, this would be demonstrated through an analysis of a case study using the WLC assessment methodology for a cradle-to-grave project life cycle to identify environmental sustainability project criteria. This would also be demonstrated through exploring specialist consultant environmental modelling examples to identify environmental sustainability project criteria.

Utilisation of information and trusted sources about climate change:

05 Trustworthy sources of CC information	
Academia	
Journals	45%
Universities & research institutes	36%
Industry	
BE practitioners & allied professionals	45%
Clients	5%
Consultants	50%
CPD	50%
Government	
Federal	0%
Bureau of Meteorology (BoM)	9%
CRCWSC – Cooperative Research Centre for Water Sensitive Cities	0%
Commonwealth Scientific and Industrial Research Organisation (CSIRO)	14%
Local	9%
State	5%
Department of Planning, Industry, & Environment (NSW)	5%
DFES - Department of Fire and Emergency Services (WA)	5%
Sustainability Victoria (VIC)	5%
The Long Paddock (QLD)	5%



Utilisation of information and trusted sources about climate change: NGOS and
Other Civil Society

NGOS and Other Bodies	
NGOs	0%
Committee for Sydney	5%
Shift Australia	5%
United Nations	9%
Sustainable Development Goals	5%

Utilisation of information and trusted sources
about climate change: Media

Media	
Documentaries	5%
LinkedIn	9%
Magazines	14%
News	50%
Podcasts	5%
Social	5%

Image: John Gollings

I fear that the climate imaginaries conjured by architects, and described in what follows, presume a definitive end to such things – an end to the climate emergency. These imaginaries dictate an enchanted future Anthropocene where human life can go on as usual. Yet, as the climate emergency unfolds, we begin to sense that there are no more neat endings; chaos begets chaos. As described in this book, the magic of architects is an illusion that is even now contributing to future chaos

The promises, dreams and hopes of architects for future cities are now inextricably linked to climate change. *Architects, Sustainability and the Climate Emergency: A Political Ecology* chronicles how architects have shaped their ideas of the city—and sustainability—as knowledge of the climate emergency has unfolded. Have architects responded to the climate crisis too slowly?

Describing a political ecology of architecture, Peter Raisbeck draws on architectural history, theory and practice, and the climate imaginaries of architects themselves. This exploration indicates how architects have viewed the climate emergency and positions architecture alongside the politics of climate and development studies. Raisbeck questions to what degree the traditional agency of architects leads to a political authority isolated from nature, human-environment systems and the nonhuman ecological subjects rapidly approaching tipping points.

The fluidity of the climate emergency itself and its unfolding relationship to architectural knowledge suggests that new approaches, agencies and subjectivities are urgently required. As architects struggle to respond to the climate emergency, this book is an important and timely contribution to sustainability, climate and development debates. *Architects, Sustainability and the Climate Emergency: A Political Ecology* is a necessary provocation of a critical topic.

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ARCHITECTS, SUSTAINABILITY AND THE CLIMATE EMERGENCY

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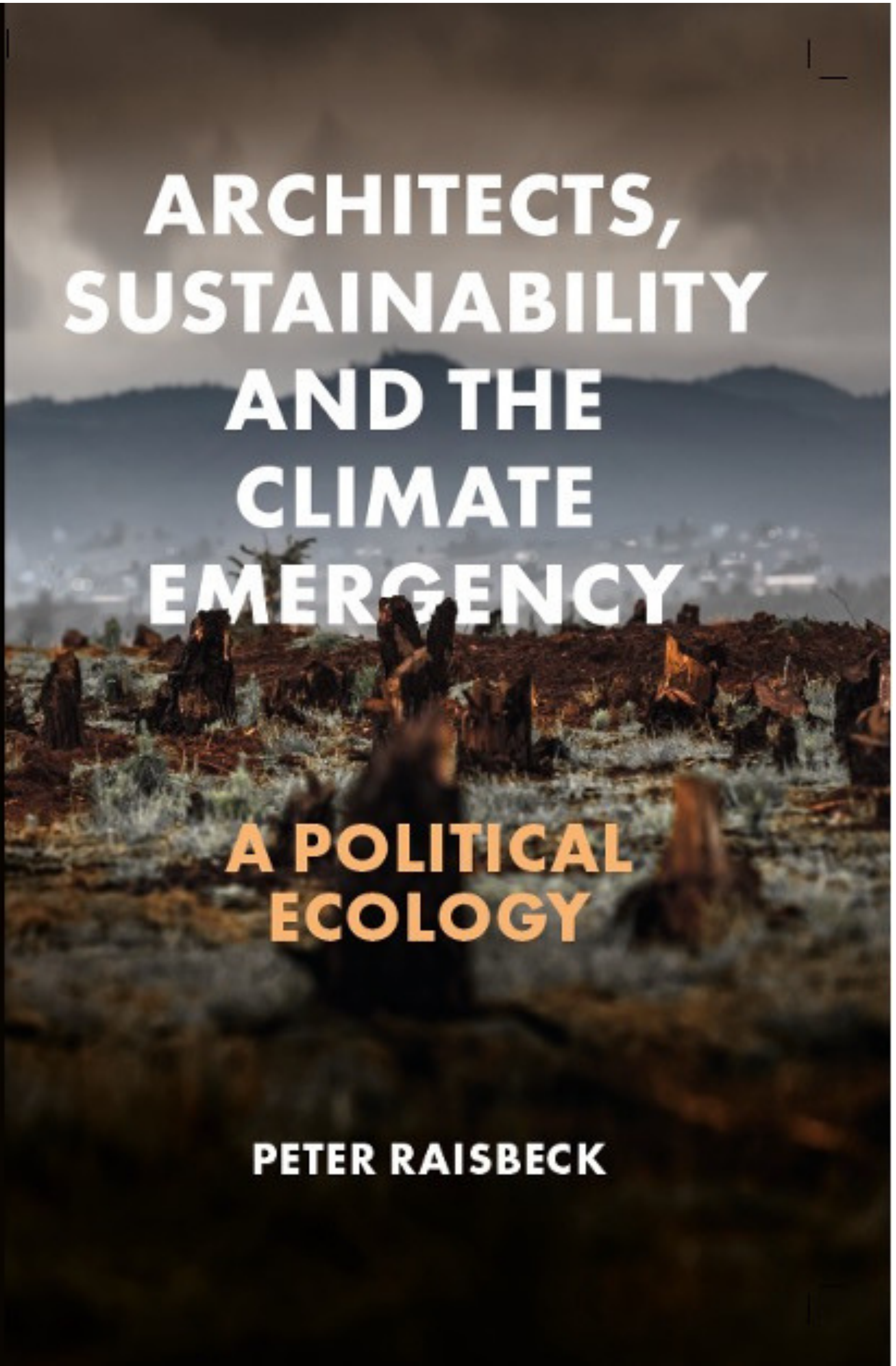


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