



## King's Research Portal

*Document Version*  
Peer reviewed version

[Link to publication record in King's Research Portal](#)

*Citation for published version (APA):*

Cowley, R. (2019). Eco-cities. In *Handbook of Urban Geography* (pp. 725-750). (Research Handbooks in Geography)..

### **Citing this paper**

Please note that where the full-text provided on King's Research Portal is the Author Accepted Manuscript or Post-Print version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version for pagination, volume/issue, and date of publication details. And where the final published version is provided on the Research Portal, if citing you are again advised to check the publisher's website for any subsequent corrections.

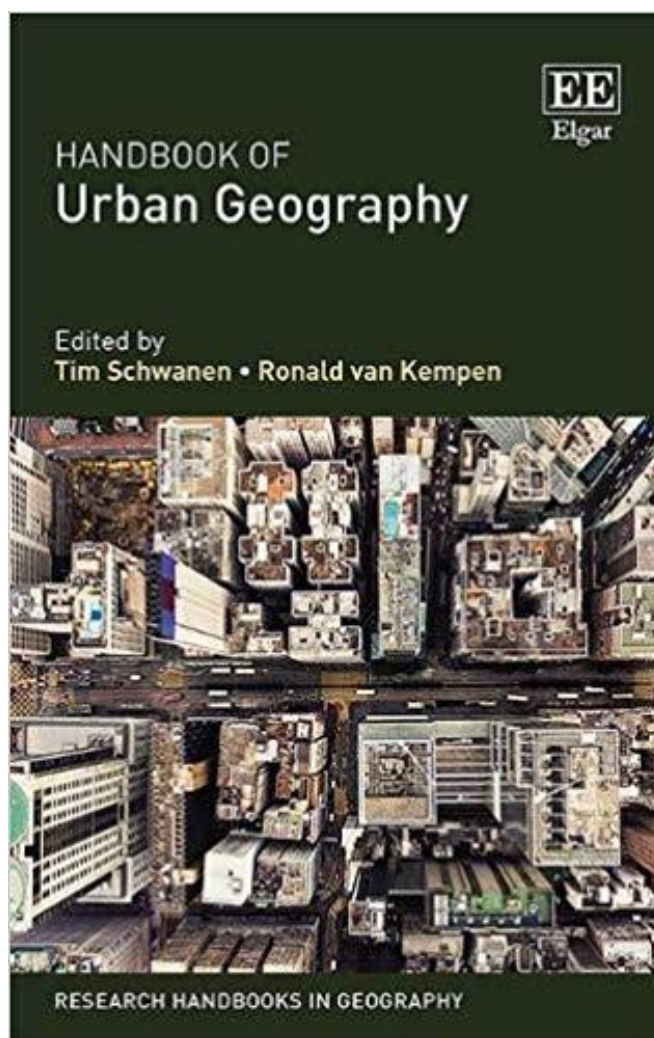
### **General rights**

Copyright and moral rights for the publications made accessible in the Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognize and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the Research Portal

### **Take down policy**

If you believe that this document breaches copyright please contact [librarypure@kcl.ac.uk](mailto:librarypure@kcl.ac.uk) providing details, and we will remove access to the work immediately and investigate your claim.



Manuscript accepted for inclusion in *Handbook of Urban Geography*, to be published 28 June 2019. In citing this document, please refer to final version: Cowley, R. (2019). 'Eco-Cities'. In Schwanen, T. & van Kempen, R. (eds.) *Handbook of Urban Geography*. Cheltenham: Edward Elgar, pp.725-750

## **X. Eco-cities**

**Robert Cowley**

### **X.1. Introduction**

The concept and practices of the eco-city have gained wide international currency among policy-makers and in the media, and attracted the attention of a growing body of academic commentators. However, for those approaching the subject for the first time, a degree of confusion would be forgivable. Rather than advancing a particular definition of the eco-city, this chapter aims at least to untangle the subject matter by reviewing the different ways in which it might be approached. In so doing, it describes the eco-city's historical origins and some of its contemporary variety. This is followed by an overview of the key critical perspectives in the academic literature. The chapter then concludes by looking to the future, suggesting that the very cityness of the eco-city may need clearer articulation if it is to realize its potential as an experimental process.

### **X.2. Making sense of the eco-city**

The broad force of the term eco-city is to communicate some type of ambition to improve the ecological health (Register, 1987) of urban areas. However, any attempt to pin down what this might mean in practice, and how precisely the eco-city differs from other models of the future city, will be hampered both by its heterogeneity in practice and by the

absence of a generally accepted set of principles or evaluative criteria. Equally, delineations of the subject matter for purposes of analysis will always be open to contestation. While the starting point, then, must be to acknowledge the fuzziness of the term, a consideration of the various possible approaches to its definition does allow some sense to emerge.

### *X.2.1. 'Eco-city' as label*

One way of arriving at a definition might be to review the totality of initiatives explicitly labelled as eco-cities. Such an undertaking would not be straightforward, however – even assuming information was readily available about all cases. A first problem arises where apparently equivalent terms are used in languages other than English. Should, for example, an Italian *ecocittà* be considered? Since *città* encompasses the English ideas of both city and town, would initiatives labelled in English as eco-towns then also qualify? Should we go on expanding the set of labels to include, for example, Greensburg GreenTown (Kansas, USA)? What if our research reveals a self-labelled eco-city initiative with a plainly rural or exurban setting? If we acknowledge that the eco-city label is often used interchangeably with various other fashionable urban descriptors (de Jong et al., 2015), then are variations such as Langfang Eco-Smart City (Hebei Province, China) admissible? Since there is no barrier to anybody calling a project an eco-city (Rapoport, 2014), this approach may well be revealing of the uses and abuses of the label to market and promote urban areas, city regions, and particular developments. Its intrinsic meaning, however, may remain out of sight.

### *X.2.2. Eco-cities as ‘megaprojects’*

Alternatively, we might seek to understand how the eco-city tends to be constructed as an object of enquiry. The international media, first, tends to portray eco-cities as large-scale, new-build urban development schemes with stated environmental ambitions, mostly located outside Europe and North America (Joss, 2011a). There is a good case for considering the eco-city in these terms. A recent report commissioned by the UK government (Moir et al., 2014), analyzing the language used to describe future cities in English-language publications, found that the term eco-city has waned in recent years, except when associated with large Asian new-builds. To the extent that this understanding of the eco-city is a commonplace one, it merits further discussion.

High-profile megaprojects feature heavily in the academic literature explicitly using the eco-city label to describe its subject matter. These include: the Chinese examples of Tianjin (see Caprotti, 2014; 2015; Caprotti et al., 2015; Flynn et al., 2016), Caofeidian (Joss and Molella, 2013), Shenzhen (de Jong et al., 2013), and the stalled Dongtan project (Chang and Sheppard, 2013; Pow & Neo, 2013; Chang, 2017); Songdo in South Korea (Shwayri, 2013); Lavasa in India (Datta, 2012); and the United Arab Emirates’ Masdar City (Caprotti, 2015; Cugurullo, 2013a; 2013b; 2015). The importance of this model of development is highlighted in a recent typology of the urban design of new towns across Asia, in which the eco-city is presented as one of six dominant approaches (Keeton, 2011).

There are several good reasons for seeing such projects as archetypes of contemporary eco-city development. First, they most clearly exemplify the tendency for eco-city initiatives to have grown in scale over time. Rapoport (2014, p. 141) typifies this new wave of eco-cities as ‘large top-down...projects master-planned by prestigious

international architects’, contrasting markedly with older, small-scale initiatives such as the German and Austrian *Oekostadte* neighbourhood retrofitting programmes of the 1990s (Joss et al., 2011; Damm, 2015), or the influential BedZED development in suburban London, completed in 2002 by non-governmental organization BioRegional. Second, they reflect the mainstreaming of the eco-city into national – and international – policy-making (Joss, 2011a; Rapoport, 2014). Masdar City’s planning and development, for example, has been closely tied to Abu Dhabi’s national economic strategies (Crot, 2013; Cugurullo, 2015). Tianjin, inhabited since 2012 but still expanding, resulted from a joint agreement between the governments of China and Singapore in 2007. Elsewhere, national governments have sponsored various eco-city programmes and competitions since the millennium, including in India, France and Japan (Joss and Cowley, 2017). Third, the Asian megaproject most clearly illustrates the so-called ‘ubiquitization’ (Joss et al., 2013) of the eco-city, whereby its spread has been accompanied by increasing international knowledge transfer involving public and private sector actors, a growing focus on carbon emissions and climate change, a fusion of ‘green’ and ‘smart’ technologies, and an underlying belief that economic growth will further environmental innovation.

### *X.2.3. Eco-city initiatives as umbrella concept*

While the eco-city as megaproject approach renders the subject matter more manageable for analytical purposes, commentators nevertheless typically acknowledge explicitly that the eco-city has broader geographical scope and practical variety. A third approach, then, is to treat it as a label accommodating a wider variety of initiatives aimed at furthering ‘green’ urban outcomes. This broader landscape of ‘eco-city initiatives’ might include retrofitting schemes, as well as policy drives relating to specific social and

environmental agendas, which may facilitate but not prescribe specific interventions in the built environment.

This approach was adopted in Joss et al.'s (2011) international survey of the phenomenon. To be included, initiatives needed to have an operational scale ranging from at least the neighbourhood to the broader city-region; to encompass multiple sectors of activity (such as urban transport, energy, and housing); and to be recognized in policy processes. The use of the label eco-city itself was not a key criterion; those adopting other cognate or closely related terms (for example, low carbon city or sustainable city or hi-tech eco-town) also qualified if they had been reported on internationally as 'environmentally friendly' urban developments.

Using this definition, the authors were able to distinguish between new-build, urban in-fill/extension and retrofit initiatives. Among these, new builds constitute the smallest group, accounting for just 24 out of the 178 cases captured (Joss et al., 2013). Two examples of the retrofitting schemes captured within this broader eco-city definition are the Eco-City Alexandria initiative (Virginia, USA) and the Eco-Smart City masterplan for the Chinese city of Langfang, mentioned earlier. The former has aimed to improve local quality of life by intervening in the management of land use and open space, water resources, air quality, transportation, energy, green building practices, solid waste, environment and health, and building resilience to unforeseen environmental threats (City of Alexandria, 2008). The Langfang master plan is explicitly positioned '[i]n contrast to the pattern of new city development common in China' (Woods Bagot, undated, no pagination). Urban in-fill and extension schemes, which typify contemporary eco-city development in Europe, include Ecociudad Valdespartera on the outskirts of Zaragoza (Spain), the four locations selected as part of the UK government's abandoned eco-towns initiative, and the widely fêted Hammarby Sjöstad brownfield regeneration area in

Stockholm (Sweden).

Even on its own terms, however, this survey does not capture the full extent of the eco-city phenomenon. The authors acknowledge that, due to reliance on internationally available sources of information, initiatives publicized only locally (and, by extension, perhaps associated more with grass-roots actors) are probably under-represented. We are reminded elsewhere that studying urban transformational initiatives exclusively through the lens of official policy may only provide a partial picture (Whitehead, 2012; Bulkeley and Castán Broto, 2013); a search for more innovative challenges to the status quo might be more fruitfully conducted among initiatives taking place outside formal institutions (Bulkeley and Castán Broto, 2013; Feola and Nunes, 2014).

A different problem with this approach lies in the difficulty of capturing the extent of eco-city development in China specifically. While Wu (2012) counts ‘more than 100’ municipal governments planning to build eco-cities or eco-towns, the Chinese Society for Urban Studies recently identified as many as 259 declarations of intent to become eco-cities (Joss et al., 2011, p. 1 and footnote 2; see also Yu, 2014, p. 78). Chien (2013, p. 177) cites a report by the China City Science Association counting more than 230 eco-cities in 2010, such that ‘more than 80 per cent of prefecture-level cities had at least one eco-city project’. Elsewhere, Ren (2013, p. 112) claims that, as of 2011, ‘more than 1,000 cities and counties had announced plans and timetables to achieve eco-city or eco-county status’. The significance of these numbers in any case remains unclear: in China, there is no generally agreed central government guidance as to what constitutes an eco-city (Wu, 2012).

#### *X.2.4. The eco-city as a set of normative principles*



Rather than drawing arbitrary boundaries around the eco-city's empirical manifestations, perhaps we should defer to its normative theorization. The original prescriptive concept of the eco-city was minimally defined by Richard Register three decades ago as an 'ecologically healthy city' (Register, 1987, p. 3). Register's broad principles, focusing on biodiversity, density and energy use, were soon complemented by David Engwicht's (1992) promotion of the city as a fragile ecology of social exchanges, and vilification of the private automobile. Joss (2015) compares Register's urban ecology principles with Kenworthy's (2006) more recent eco-city dimensions and Lehmann's (2010) principles of green urbanism. Despite clear thematic commonality (all are variously concerned, for example, with mobilities, compact urban design, waste management, local food production, economic viability, and the need for places to be desirable and attractive for residents), these three frameworks are also subtly descriptive of shifts in broader thinking about the (urban) environment over time. Thus, while the urban ecology principles focus on local and city-regional issues, Lehmann's framework has a more global scope, encompassing climate change and the needs of the developing world. In foregrounding the creation of closed-loop systems, Kenworthy's ideas reflect the 'growing use of systems thinking underpinning urban sustainability concepts' (Joss, 2015, p. 21). While Register makes no reference to CO<sub>2</sub> emissions, these are at the core of Lehmann's principles, no doubt reflecting the rise of the carbon agenda in environmental thinking since the millennium (While et al., 2010; Bulkeley and Castán Broto, 2013). And other, quite different definitions have been formulated in the meantime. Downton (2009), for example, synthesizes different strands of what he called ecopolis theory into an overarching framework with social justice as a guiding principle.

A revival of this normative definitional work might be discerned in the recent proliferation of urban sustainability certification schemes and frameworks of indicators

(Joss et al., 2015), often labelled using eco-city or cognate terms, and intended to be applicable across different urban settings. While varying considerably in their criteria and governance functions, such schemes imply the possibility of some *de facto* standardization of environmentally friendly urban development in the near future. We might hypothesize that such standardization would primarily reflect the differentiated ability of the various actors involved (ranging from small NGOs to large private sector engineering and IT companies, and international governmental bodies) to promote their own schemes, or their relative acceptability to adopters working within existing commercial and policy constraints. The emergence of a pragmatic consensus, in other words, would not necessarily provide a definitive answer to the question of what the eco-city should consist of.

#### *X.2.5. Eco-city as provocative oxymoron*

Reviewing the ways that normative definitions of the eco-city have changed over time may invite the conclusion that it merely holds up a mirror to its shifting commercial and policy contexts. However, its more intrinsic conceptual force becomes evident through a consideration of the conditions of its historical emergence. In one sense, the nascent eco-city thinking of the 1980s was derivative, displaying continuity with grass-roots and anti-establishment environmental movements and ideas emerging in the 1960s and 1970s, including ecofeminism, bioregionalism, appropriate technology, environmental justice and the steady state (Roseland, 1997). However, practical living experiments associated with such ideas had typically taken the form of rural ecovillages (Barton and Kleiner, 2000; Dawson, 2006; Rapoport, 2014), drawing on an anti-urban *zeitgeist* in which the city had

long been constructed as ‘the antithesis of environmentally sustainable futures, green living and the survival of ‘nature’’ (Hinchliffe, 1999, p. 145). The environmental discourse of the time tended to position cities as essentially parasitical, the locus of political and economic problems (Taylor, 2013), and to equate the ‘good life’ with ‘smaller communities’ (Haughton, 2007, p. 278). The radical essence of the eco-city, in this context, was the proposition that environmental improvements could and should take place in *urban* settings. The eco-city, at its historical heart, had generative force as a provocative apparent oxymoron.

By inverting dominant assumptions about the potential ecological and social benefits of rural versus urban life, earlier normative conceptions of eco-city development have had ongoing resonance (with Richard Register’s work typically accorded seminal status by current writers on sustainable urban development). The generative force of this provocation is evidenced by the extent to which early eco-city principles have passed into mainstream thinking about sustainable urban design. While, for example, urban density was until relatively recently associated with unsanitary slum conditions, it is now widely valorized, in line with Register’s (1987, 2006) vision, as are facilitating public transport provision and use, healthy walking and cycling, greater sociability, enlivened public spaces and resource efficiencies in domestic heating.

A historical perspective also allows the eco-city to be differentiated from the sustainable city. First, the eco-city predates the discourse of urban sustainability, even if the international rise of the latter has certainly catalyzed its spread as an idea (Joss, 2011a; Rapoport, 2014). And, second, if sustainable development is understood as a particular – albeit loose – discourse within environmental thinking (Dryzek, 2005), then the eco-city is a broader church: in some cases continuing to encompass less anthropocentric forms of green politics; in others, embracing the more market-oriented philosophies of ecological

modernization and green growth.

#### *X.2.6. Eco-city as experimental process*

If the search for commonalities across time and space only takes us so far, it may be more sensible to embrace the eco-city's multiplicity as a defining characteristic. From this perspective, it might be understood as a historically situated, multiple process of real-world experimentation into future modes of societal organization. It is historically situated in that it responds to a series of particular contemporary concerns over local and global environments, ongoing global urbanization, problematic processes of rapid city growth in the global South, and the future of post-industrial cities in the global North (Joss, 2011a). Viewed in experimental terms, the eco-city constitutes a 'technical and scientific repository and container of potential solutions' in an 'age of crisis' (Caprotti, 2015, p. 9).

Its experimental variety relates not only to trialled green and digital technologies, and urban forms, but also to processes of delivery and management. Current and recent eco-city initiatives exhibit a broad spectrum of modes of implementation, ranging from very detailed top-down planning orchestrated by central government (as in the case of *Sejong City* in South Korea), through to newer, dispersed forms of governance involving collaborative networks of local actors (for example, the *EcoDistricts* initiative in Portland, Oregon USA). And just as we might expect to learn from the success or failure of new technologies to spread from particular experimental niches (Geels, 2002), the eco-city as a variegated experimental process may also yield important lessons for urban governance at different scales. If

ongoing learning is an important part of this process, then critical commentary on the eco-city serves a vital role, and it is to this that we now turn.

### **X.3. Critical perspectives**

#### *X.3.1. Environmental credentials*

In environmental terms, eco-cities may make an easy target for criticism. ‘Scientific’ claims about their environmental performance are prone to contestation, both because no definitive set of eco-city indicators exists, but also – following Hulme (2009) – because they may be shaped by particular deep-rooted values which are incompatible with those of others. Actors placing faith in market-led green economic growth, for example, are likely to adopt rather different criteria than, say, anti-capitalist campaigners, or advocates of deep ecology. But questioning the eco-credentials of eco-cities need not only be a matter of arbitrarily privileging one set of values over another. More constructively, it may help us acknowledge and understand the contingent nature of particular framings of the environment. In a recent study of Tianjin’s current residents’ behaviours, for example, Flynn et al. (2016, p. 86) suggest that observable efficiency gains from new technologies may be outweighed by increased consumption among the ‘upwardly mobile wage earners’ which the city is attracting. By observing that Caofeidian Eco-City lacks a ‘symbiotic relationship’ with its hinterland in terms of renewable energy provision and sustainable transport, Joss and Molella (2013, p. 123) challenge the spatial framing of official environmental claims. Equally, they question the temporal framing of official accounts by noting that these omit the carbon emissions

associated with the land reclamation required for Caofeidian's construction (Joss and Molella, 2013, p. 129). Such insights not only broaden the scope of future critical research, but potentially serve to counterbalance the instrumental mobilization of selective criteria to support marketing strategies or strategic political campaigns.

Critical analysis of environmental credentials may deliberately aim to reveal underlying values and discourses, rather than contest the choice of superficial criteria. Caprotti, for example, suggests that the promotion of certain megaproject eco-cities reveals a modernist society/nature binary opposition, whereby the aim is not so much to resolve broader environmental problems as to shield residents from them (Caprotti, 2014b, p. 1293). The presentation of Masdar City, meanwhile, implies an understanding of a 'positive juxtaposition' to a hostile desert – a 'negative 'first nature,' which needs to be transformed through technology into a green, pleasant, cool and low-carbon urban 'second-nature'' (Caprotti, 2015, p. 80). Alternatively, critics may consciously seek to promote an alternative set of deep values in arguing that a given initiative is flawed. From the starting assumption, for example, that an urgent, radical restructuring of the global social and economic system is required, pragmatic experimentation and incrementalism may appear to illustrate a collective self-delusion (Rees, 2015) allowing business as usual to proceed at a time when 'the world is on course for collapse — ecological implosion, resource wars, civil insurrection and geopolitical chaos' (Rees, 2015:3).

### *X.3.2. Neo-liberal eco-urbanism*

Whether or not they catalyze business as usual, eco-cities are sometimes criticized

for foregrounding economic considerations over others (e.g. Romero Lankao, 2007; Datta, 2012; Cugurullo, 2013a; 2013b). The internationalization of the phenomenon has been accompanied by its embedment into global circuits of trade, with the enthusiastic involvement of international consulting, engineering and IT firms (Joss et al., 2013). Meanwhile, the use of the eco-city label for ‘cultural branding’ (Joss, 2011a, p. 14) would seem symptomatic of a broader pattern of inter-urban economic competition. Such arguments may bolster a reading of the contemporary eco-city through the lens of what Whitehead (2013) calls neoliberal urban environmentalism, characterized by ‘market-oriented governance, enhanced privatization and urban environmental entrepreneurialism’ (Whitehead, 2013, p. 1348).

The public-private hybrid arrangements through which eco-city projects are increasingly delivered (Joss et al., 2013) may also raise questions for those who interpret the broader shift towards more networked governance as indicative of the ‘neoliberalization’ of urban policy-making (see e.g. Brenner and Theodore, 2002; Purcell, 2008; Gualini, 2010). In his studies of Treasure Island and Sonoma Mountain Village eco-city schemes in California, Joss (2011b) suggests that their governance at a distance development models have unclear implications for sustainability, alerting us to the possibility that the complexity of such arrangements hinders accountability and public engagement (Joss, 2015).

### *X.3.3. Social justice*

The risk of eco-city developments coming to constitute ‘premium eco-enclaves’ is contemplated by Hodson and Marvin (2010), who paint a dystopian picture of a future

characterized by ‘an archipelago of interconnected ‘self-reliant’ islands’ (Hodson and Marvin, 2009, p. 210) of wealthy cities in an otherwise socially and environmentally degraded world. Indeed, Grydehøj and Kelman (2016, 2017) observe that many eco-city initiatives are literally located on small islands or near-islands, with examples including Dongtan Eco-City on Chongming Island near Shanghai and the Västra Hamnen area of Malmö, Sweden. The bounded nature of these island spaces adds to their appeal as sites of experimentation. And yet their contribution to global sustainability is questionable insofar as they operate as ‘secessionary enclaves’ for elite groups, and proceed by ‘monetising the environment, incentivising largely symbolic ‘green’ projects and architecture, drawing attention away from unsustainable practices elsewhere, and exacerbating social inequality’ (Grydehøj and Kelman 2016, p. 3).

Other critics focus on intra-urban social divisions and inequalities related to eco-city development. Watson (2014) includes eco-cities among the types of projects used by African countries to attract inward investment. Not only does she question their goal of being ‘self-contained and able to insulate themselves from the ‘disorder’ and ‘chaos’ of the existing cities’ (Watson, 2014, p. 229), but suggests that ‘the most likely outcome of these fantasy plans is a steady worsening of the marginalization and inequalities that already beset these cities’ (Watson, 2014, p. 215). In China, the poor treatment of migrant workers on megaproject eco-city construction sites has been highlighted (Chien, 2013; Caprotti, 2014a, 2014b) alongside other problematic social side-effects: the rich have benefitted at the expense of social goods; existing public buildings have been wastefully demolished; and local citizens forcibly displaced (Chien, 2013). Such concerns dovetail with those of the literature on eco-gentrification (see e.g. Dooling, 2009; Quastel, 2009; Checker, 2011), which most often focuses on the rather different context of North America.



#### *X.3.4. Techno-utopianism*

The commonly desired eco-city goal of replicability (Hodson and Marvin, 2010) implies that eco-city actors may sometimes downplay the significance of place-specific historical, social, political and cultural factors for promotional purposes, presenting a ‘techno-economic paradigm’ (Rydin, 2011, p. 131) for universal consumption. Accordingly, one key strand of the critical literature explores the problem of framing eco-city ambitions in strongly technological terms (e.g. Yigitcanlar and Lee, 2013; Shwayri, 2013; Carvalho, 2014; Caprotti, 2015). The ‘megaproject’ eco-city in particular is characterized as having a technocratic and systems-based engineering approach to urban design, such that the vision of the urban arguably ‘becomes devoid of human and political potential’ (Caprotti, 2014b, p. 1287).

The foregrounding of technological solutions is aligned with the use of a recognizable type of utopian rhetoric for promotional purposes. In one reading, Masdar City’s projected image as ‘an ideal urban development in balance with nature’ is undermined by its lack of urbanity, as ‘a non-anthropological spatial entity bereft of an organic society’ (Cugurullo, 2013a, pp. 33-34). On this view, Masdar’s use of ‘[i]mages of the ideal city ... to boost the local economy and fulfil the political interests of the ruling class’ (Cugurullo, 2013b, p. 66) exemplifies the use of such rhetoric to obscure contingent economic and political agendas, in the service of enabling the export of technologies to other locations.

Of course, technological blueprints and ubiquitous master plans should not be equated with the cities or practices which result in real-world contexts. The involvement

of internationally recognized planners, designers, architects or engineering companies may often serve primarily to legitimize proposals locally (Chang and Sheppard, 2013; Rapoport, 2015); the city actually built – and inhabited – may be a different matter altogether. Nevertheless, it seems important to question whether the contemporary eco-city might not retain unacknowledged ‘[u]topian underpinnings’ (Vallance et al., 2011, p. 346). This may be more obviously the case for its earliest theorizations, reflecting the idealism of the eco-village, and arguably echoing a longer tradition of utopian urban visions, including the Garden City movement, the Techno-City (Kargon and Molella, 2008), and the UK’s New Towns, all attempting to ‘reinvent the city’ (Joss, 2010, p. 240). We might not therefore expect Richard Register (1987, 2006), in outlining his aspirational vision of the good city, to have wrestled with difficult questions of governance and politics. But in drawing up plans for real-world implementation, such questions become rather more pertinent. The UK’s (eventually abandoned) eco-towns initiative – specified in highly technological terms by national government (DCLG, 2009) – was hampered significantly by vociferous opposition from local residents in the four chosen locations.

#### **X.4. Conclusions – Looking to the future**

What, then, is the eco-city? A promotional label (or buzz word)? A particular type of new-build urban development? A broader category of loosely related environmental initiatives focused on city space? An aspirational set of norms? A generative historical provocation? An open-ended experimental process? It might be any of these, depending on our intentions. But the eco-city is not only a malleable discursive

construct: it is backed internationally by policy-making at different levels, and by substantial commercial resources. It deserves our attention, in other words, because it has tangible effects on the world.

And yet the significance of these effects is ambiguous. The critical perspectives above reflect on a process of translation whereby, over time, a radically innovative idea has come to be realized in different real-world contexts. In the most pessimistic assessments, its transformative potential has largely been compromised as related practices have emerged through existing political institutions and market structures; even best practice showcase outcomes appear to have negligible broader impact, and may even be reproducing the structural conditions of unsustainability. In a more flattering light, however, eco-city initiatives, individually or collectively, may represent a constructively incremental approach to a series of pressing global problems. On this view, any given eco-city initiative, particularly when accompanied by critical reflection and knowledge-sharing, might be welcomed more pragmatically as ‘just ... a step in a much more ambitious undertaking towards less- wasteful lifestyles in built environments, more sustainably in tune with their broader context and future needs’ (Ryser, 2014, p. 123). Accordingly, there is a need to engage with eco-cities as ‘sites of experimentation and innovation’ which may help ‘drive broader socio-technical transitions’, rather than as failing in the utopian ambitions with which they are marketed (Rapoport, 2014, p.137). And if the current field of eco-city experimentation is dysfunctional, to the extent that it is disproportionately shaped by powerful commercial and political actors, then critical engagement has a vital corrective role to play.

Looking beyond the utopian rhetoric, however, may also require us to pay closer attention in the future to the *cityness* of the eco-city. This is not only a matter of acknowledging the complexity of urban systems and the need for convincing eco-city

development to be comprehensive and integrative rather than sector-specific in its achievements. It also requires caution in the face of those plans and visions which conceptualize the city reductively as a particular scale of governance. In grappling with the technological challenges of transformative change at the city-wide scale, there is a risk of overlooking the dynamic life of cities as *political* and *public* spaces, marked by social tensions, irrationality, and conflict, as much as by civility and functionality. Citizenship, after all, entails more than passive, compliant service use. And while the unpredictable performative public dimensions of the (eco-)city can perhaps never be planned *for*, we might be alert to the risk that they may be planned *against*. If acknowledging this risk is difficult from within the scalar conceptual framework underpinning the commonplace assertion that we now live in the Urban Age (Brenner and Schmid, 2014), then more imaginative (eco-)city geographies may be required to secure more convincingly urban outcomes in the interests of all.

Meanwhile, it seems misguided to expect a universally applicable model of environmentally friendly urban life to emerge from the iterative processes of eco-city experimentation. An optimistic student of the eco-city might instead hope that their collective outcomes will be both unpredictable and generative of a multiplicity of quite different ways of thinking about the future – which may or may not rely on the spatial framing of the city.

## References

Barton, Hugh and Deborah Kleiner (2000), ‘Innovative eco-neighbourhood projects’, in Hugh Barton (Ed.), *Sustainable Communities: The Potential for Eco-Neighbourhoods*,

London: Earthscan, pp. 66–85.

Brenner, N. and C. Schmid (2014), 'The 'Urban Age' in question', *International Journal of Urban and Regional Research*, **38** (3), 731–755.

Brenner, N. and N. Theodore (2002), 'Cities and the geographies of 'actually existing neoliberalism'', *Antipode*, **34** (3), 349–379.

Bulkeley, H. and V. Castán Broto (2013), 'Government by experiment? Global cities and the governing of climate change', *Transactions of the Institute of British Geographers*, **38** (3), 361–375.

Caprotti, Federico (2015), *Eco-Cities and the Transition to Low Carbon Economies*, Basingstoke: Palgrave Macmillan.

Caprotti, F. (2014a), 'Critical research on eco-cities? A walk through the Sino-Singapore Tianjin Eco- City, China', *Cities*, **36**, 10–17.

Caprotti, F. (2014b), 'Eco-urbanism and the eco-city, or, denying the right to the city?', *Antipode*, **46** (5), 1285–1303.

Caprotti, F., C. Springer and N. Harmer (2015), '"Eco" for whom? Envisioning eco-urbanism in the Sino- Singapore Tianjin Eco-city, China', *International Journal of Urban and Regional Research*, **39** (3), 495–517.

Carvalho, L. (2015), 'Smart cities from scratch? A socio-technical perspective', *Cambridge Journal of Regions, Economy and Society*, **8** (1), 43–60.

Chang, I-C.C. and E. Sheppard (2013), 'China's eco-cities as variegated urban sustainability: Dongtan Eco-City and Chongming Eco-Island', *Journal of Urban Technology*, **20** (1), 57–75.

Chang, I-C.C. (2017), 'Failure matters: Reassembling eco-urbanism in a globalizing China', *Environment and Planning A*, **49** (8), 1719–1742.

Checker, M. (2011), 'Wiped out by the 'greenwave': environmental gentrification and the

paradoxical politics of urban sustainability', *City & Society*, **23** (2), 210–229.

Chien, S.-S. (2013), 'Chinese eco-cities: a perspective of land-speculation-oriented local entrepreneurialism', *China Information*, **27** (2), 173–196.

City of Alexandria (2008), 'Eco-City Charter 2008', available at:

<http://alexandriava.gov/uploadedFiles/tes/oeq/EcoCityCharter2008.pdf> (accessed 5 August 2018).

Crot, L. (2013), 'Planning for sustainability in non-democratic polities: the case of Masdar City', *Urban Studies*, **50** (13), 2809–2825.

Cugurullo, F. (2013a), 'How to build a sandcastle: an analysis of the genesis and development of Masdar City', *Journal of Urban Technology*, **20** (1), 23–37.

Cugurullo, F. (2013b), 'The business of utopia: Estidama and the road to the sustainable city', *Utopian Studies*, **24** (1), 66–88.

Cugurullo, F. (2016), 'Urban eco-modernisation and the policy context of new eco-city projects: where Masdar City fails and why. *Urban Studies*, **53** (11), 2417–2433.

Damm, T. (2015), 'Eco-Cities vs. Ökostädte: similarities and differences', available at <https://www.westminster.ac.uk/eco-cities/reflections> (accessed 4 August 2018).

Datta, A. (2012), 'India's ecocity? Environment, urbanisation, and mobility in the making of Lavasa', *Environment and Planning C: Government and Policy*, **30** (6), 982–996.

Dawson, Jonathan (2006), *Ecovillages: New Frontiers for Sustainability*. Totnes: Green Books.

DCLG (2009), *Planning Policy Statement: eco-towns: A supplement to Planning Policy Statement 1*, London: Communities and Local Government Publications.

De Jong, M., S. Joss, D. Schraven, C. Zhan and M. Weijnen (2015), 'Sustainable-smart-resilient-low carbon-eco-knowledge cities; making sense of a multitude of concepts promoting sustainable urbanization', *Journal of Cleaner Production*, **109**, 25–38.

- De Jong, M., D. Wang and C. Yu (2013), 'Exploring the relevance of the eco-city concept in China: The case of Shenzhen Sino-Dutch low carbon city', *Journal of Urban Technology*, **20** (1) 95–113.
- Dooling, S. (2009), 'Ecological gentrification: a research agenda exploring justice in the city', *International Journal of Urban and Regional Research*, **33** (3), 621–639.
- Downton, Paul F. (2009). *Ecopolis: Architecture and Cities for a Changing Climate*, Adelaide: Springer.
- Dryzek, John S. (2005). *The Politics of the Earth: Environmental Discourses*, Oxford: Oxford University Press.
- Engwicht, David (1992). *Towards an Eco-City: Calming the Traffic*, Sydney: Envirobook.
- Feola, G. and R.J. Nunes (2014), 'Success and failure of grassroots innovations for addressing climate change: the case of the transition movement', *Global Environmental Change*, **24**, 232–250.
- Flynn, A., L. Yu, P. Feindt and C. Chen (2016), 'Eco-cities, governance and sustainable lifestyles: the case of the Sino-Singapore Tianjin Eco-City', *Habitat International*, **53**, 78–86.
- Geels, F.W. (2002), 'Technological transitions as evolutionary reconfiguration processes: a multi-level perspective', *Research Policy*, **31** (8), 1257–1274.
- Grydehøj, A. and I. Kelman (2016), 'Island smart eco-cities: Innovation, secessionary enclaves, and the selling of sustainability', *Urban Island Studies*, **2**, 1–24.
- Grydehøj, A. and I. Kelman (2017), 'The Eco-Island Trap: Climate change mitigation and conspicuous sustainability', *Area*, **49** (1), 106–113.
- Gualini, Enrico (2010), 'Governance, space and politics: exploring the governmentality

of planning', in Jean Hillier and Patsy Healey (eds), *The Ashgate Research Companion to Planning Theory: Conceptual Challenges for Spatial Planning*, Farnham: Ashgate, pp. 57–85.

Haughton, Graham (2007), 'In pursuit of the sustainable city', in Peter J. Marcotullio and Gordon McGranham (eds), *Scaling Urban Environmental Challenges: From Local to Global and Back*, London: Earthscan, pp. 274–290.

Hinchliffe, Steve (1999), 'Cities and natures: intimate strangers', in John Allen, Doreen Massey and Michael Pryke (eds), *Unsettling Cities: Movement/Settlements*, London: Routledge, pp. 141–185.

Hodson, M. and S. Marvin (2009), '“Urban ecological security”: a new urban paradigm?', *International Journal of Urban and Regional Research*, **33** (1), 193–215.

Hodson, M. and S. Marvin (2010), 'Urbanism in the anthropocene: ecological urbanism or premium ecological enclaves?' *Cities*, **14** (3), 298–313.

Hulme, Mike (2009), *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge: Cambridge University Press.

Joss, S. (2011a), 'Eco-cities: the mainstreaming of urban sustainability - key characteristics and driving factors', *International Journal of Sustainable Development Planning*, **6** (2), 1–18.

Joss, S. (2011b), 'Eco-city governance: a case study of Treasure Island and Sonoma Mountain Village', *Journal of Environmental Policy and Planning*, **13** (4), 331–348.

Joss, Simon (2015), *Sustainable Cities: Governing for Urban Innovation*, London: Palgrave Macmillan.

Joss, S. and A. Molella (2013), 'The eco-city as urban technology: perspectives on Caofeidian International Eco-City (China)', *Journal of Urban Technology*, **20** (1), 115–137.



Joss, Simon and Robert Cowley (2017), 'National policies for local urban sustainability: a new governance approach?', in Malcolm Eames, Tim Dixon, Miriam Hunt and Simon Lannon (eds), *Retrofitting Cities for Tomorrow's World*, Oxford: Wiley-Blackwell, pp. 227–245.

Joss, Simon, Robert Cowley, Martin de Jong, Bernhard Müller, Buhm Soon Park, William Rees, Mark Roseland and Yvonne Rydin (2015), *Tomorrow's City Today: Prospects for Standardising Sustainable Urban Development*, London: University of Westminster International Eco-Cities Initiative.

Joss, S., R. Cowley and D. Tomozeiu (2013), 'Towards the 'ubiquitous eco-city': an analysis of the internationalisation of eco-city policy and practice', *Urban Research and Practice*, **6** (1), 54–74.

Joss, Simon, Daniel Tomozeiu and Robert Cowley (2011). *Eco-Cities - A Global Survey 2011*. London: University of Westminster International Eco-Cities Initiative.

Kargon, Robert H. and Arthur P. Molella (2008), *Invented Edens: Techno-cities of the twentieth century*, Cambridge, MA: MIT Press.

Keeton, Rachel (2011), *Rising in the East - Contemporary New Towns in Asia*, Amsterdam: SUN Architecture.

Kenworthy, J.R. (2006), 'The eco-city: ten key transport and planning dimensions for sustainable city development', *Environment and Urbanization*, **18** (1), 67–85.

Lehmann, Steffen (2010), *The Principles of Green Urbanism: Transforming the City for Sustainability*, London: Earthscan.

Moir, Emily, Tim Moonen and Greg Clark (2014), *What Are Future Cities? Origins, Meanings and Uses*, London: Future Cities Catapult.

Pow, Choon-Piew and Harvey Neo (2013), 'Seeing red over green: contesting urban sustainabilities in China', *Urban Studies*, **50** (11), 2256–2274.

Purcell, Mark (2008), *Recapturing Democracy: Neoliberalization and the Struggle for Alternative Urban Futures*, Abingdon: Routledge.

Quastel, Noah (2009), 'Political ecologies of gentrification', *Urban Geography*, **30** (7), 694–725.

Rapoport, E. (2014), 'Utopian visions and real estate dreams: The eco-city past, present and future', *Geography Compass*, **8** (2), 137–149.

Rapoport, E. (2015), 'Globalising sustainable urbanism: the role of international masterplanners', *Area*, **47** (2), 110–115.

Rees, William E. (2015), 'The context for thinking about 'eco-city' initiatives', available at <https://www.westminster.ac.uk/eco-cities/reflections> (accessed 5 August 2018).

Register, Richard (2006), *Ecocities: Rebuilding Cities in Balance with Nature*.

Gabriola Island, B.C., Canada: New Society Publishers.

Register, Richard (1987), *Ecocity Berkeley: Building Cities for a Healthy Future*.

Berkeley, CA: North Atlantic Books.

Ren, Xuefei (2013), *Urban China*, Cambridge: Polity Press.

Romero Lankao, Patricia (2007), 'Are we missing the point?', *Environment and Urbanization*, **19** (1), 159–175.

Roseland, Mark (1997), 'Introduction: dimensions of the future: an eco-city overview', in Mark Roseland (Ed.), *Eco-city Dimensions: Healthy Communities, Healthy Planet*, Gabriola Island, B.C., Canada: New Society Publishers, pp. 1–12.

Rydin, Yvonne (2011), *The Purpose of Planning: Creating Sustainable Towns and Cities*, Bristol: Policy Press.

Ryser, Judith (2014), 'Eco-cities in action: sustainable development in Europe – lessons for and from China?', in William Hofmeister, Patrick Rueppel and Liang-Fook Lye (eds), *Eco-Cities: Sharing European and Asian Best Practices and Experiences*.

- Singapore: Konrad-Adenauer Stiftung and Brussels: Europe, pp. 107–123.
- Shwayri, S.T. (2013), 'A model Korean ubiquitous eco-city? The politics of making Songdo', *Journal of Urban Technology*, **20** (1), 39–55.
- Taylor, Peter J. (2013), *Extraordinary Cities: Millennia of Moral Syndromes, World-Systems and City/State Relations*, Cheltenham: Edward Elgar.
- Vallance, S., H.C. Perkins and J.E. Dixon (2011), 'What is social sustainability? A clarification of concepts', *Geoforum*, **42** (3), 342–348.
- Watson, Vanessa (2014), 'African urban fantasies: dreams or nightmares?' *Environment and Urbanization*, **26** (1), 215–231.
- While, A., A.E.G. Jonas and D. Gibbs (2010), 'From sustainable development to carbon control: eco-state restructuring and the politics of urban and regional development', *Transactions of the Institute of British Geographers*, **35** (1), 76–93.
- Whitehead, M. (2013), 'Neoliberal urban environmentalism and the adaptive city: towards a critical urban theory and climate change', *Urban Studies*, **50** (7), 1348–1367.
- Whitehead, Mark (2012), 'The sustainable city: an obituary? On the future form and prospects', in John Flint and Mike Raco (eds), *The Future of Sustainable Cities: Critical Reflections*, Bristol: Policy Press, pp. 29–46.
- Woods Bagot (undated), 'Langfang eco-smart city and transportation hub, Langfang, China: Metropolitan masterplan for future generations', available at <http://www.woodsbagot.com/project/langfang-eco-smart-city> (accessed 15 January 2016).
- Wu, F. (2012), 'China's eco-cities', *Geoforum*, **43** (2), 169–171.
- Yigitcanlar, T. and S.H. Lee (2014), 'Korean ubiquitous-eco-city: a smart-sustainable urban form or a branding hoax?', *Technological Forecasting & Social Change*, **89**, 100–114.

Yu, Li (2014). *Chinese City and Regional Planning Systems*, Farnham: Ashgate.