

DEFINING THE ECO-CITY: A DISCURSIVE APPROACH

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Abstract

This paper presents the results of a discourse analysis of documents describing six different eco-city projects: Dongtan Eco-City, Masdar City, Sonoma Mountain Village, Hammarby Sjöstad, Eco-village Ithaca, and Malmö bo01. The aim of the research was to uncover the diversity underneath the various uses of the term eco-city, and to determine the extent of convergence or divergence in the way projects conceive of what an eco-city should be. The research looked at five categories of urban sustainability discourse: the aspect of sustainability emphasised, whether eco-city projects saw themselves as a model for future urban development or as an educational tool, the way in which eco-cities proposed to make urban living more sustainable, the extent to which projects looked at achieving sustainability by design or through governance and management, and the type of actors that play a role in the eco-city. The results suggest that there is a great deal of diversity among projects considered to be eco-cities. In this sense, we argue, it is better to think of the eco-city as an ambition or objective which there will be multiple ways to achieve.

Keywords: Eco-city, discourse, sustainability, planning, environment

INTRODUCTION

With both the rapid growth of the world's urban population and increasing concern about the environment, the challenge of making urban living more sustainable is in the forefront of the minds of many designers, academics and government officials. In recent years, one response that has gained increasing prevalence is the idea of the 'eco-city.' Richard Register, a California based architect widely credited as the first to have coined the term defined an eco-city in 1987 as "an urban environmental system in which input (of resources) and output (of waste) are minimized" (Register 2002). As the term's usage has become more widespread, so too have the meanings associated with it and the diversity of projects adopting the label. Already in the late 1990s, Roseland argued that there was no single accepted definition of the eco-city. Rather, he proposed, it was more a collection of ideas about concepts such as urban planning, housing, transportation, and economic development (Roseland 1997).

Reading these early writers on eco-cities it is difficult to develop a clear, comprehensive vision of what an eco-city actually looks like. This began to change in the early 2000s when a number of ambitious plans began to emerge for brand new sustainable urban districts and cities. High-profile examples include Hammarby Sjöstad, in Stockholm, Sweden and Masdar City, in Abu Dhabi, United Arab Emirates (UAE). China in particular, through the State Environmental Protection Administration (SEPA), has supported the development of a number of eco-city projects around the country. Tianjin Eco-city, which is currently under construction, is due to be complete and home to 350,000 people by 2020.

Yet as the usage of the term spreads, what exactly constitutes an eco-city seems to be even more unclear. Today an ever-increasing range of existing cities and new urban projects, from minor retrofits to large-scale new-towns, call themselves, or are labelled, eco-cities. The most comprehensive survey of eco-cities to date was carried out in 2009-10 by Joss. Joss admits that the conceptual diversity and plurality of initiatives using the term makes it difficult to develop a meaningful definition. He ultimately questions the usefulness of attempting to define eco-city narrowly. Instead he elects to define the term using three analytical categories. Thus according to Joss an eco-city must be a development of substantial scale, occurring across multiple sectors, which is supported by policy processes (Joss 2011: 12).

This paper accepts Joss's definition as a starting point. However it will also question whether in the search for similarities among eco-cities, Joss glosses over substantial differences between these projects. The purpose of this paper is to use a discourse analysis to test the hypothesis was that there is a substantial diversity in the way eco-city projects promote themselves and are written about. The paper begins with a brief overview of the value of discourse analysis as an analytical tool in the social sciences. It then puts forward a set of categories of environmental discourses that are often used in discussions of urban development and sustainability. It then presents the methodological approach followed by a discussion of the results of the analysis. The findings are presented in tabular and descriptive format. This is followed by a discussion pulling out the points of convergence and divergence among the case studies, and a conclusion discussing the implications of the findings for future research on eco-cities.

ECO-CITIES AND ENVIRONMENTAL DISCOURSES

Much of the broader literature on sustainable cities is analytical, attempting to test various propositions about what makes a city sustainable. Work on eco-cities, however, tends to either attempt to describe the phenomenon (Roseland 1997; Joss 2010) or focuses on normative prescriptions for achieving eco-city status (Register 2002; Girardet 2008; Kenworthy 2006). From this prescriptive literature it appears that the eco-city could be understood as a way of practically applying existing knowledge about what makes a city sustainable to the planning and design of new and existing cities. However what is 'known' about the relationship between planning and urban design interventions and sustainability objectives is a subject of much debate (Bulkeley & Betsill 2005; Williams 2009). This means that realizing an eco-city requires making countless decisions about sustainable technologies, urban form, building design and governance.

How, though are these decisions made? Many contemporary scholars and theorists of urban and environmental planning processes argue that this occurs through a social process consisting of complex negotiations, and often disputes (Flyvbjerg 1998; Hajer 1995; Healey 2007). This paper adopts this perspective and hence views eco-city initiatives as socially constructed through design and policy-making processes. Thus the eco-city is not a model or a template, but the outcome of a social process involving numerous stakeholders. From this perspective it is easier to make sense of the diversity of different eco-city initiatives. The eco-city is the solution to a problem; perhaps the diversity of eco-city initiatives reflects different ideas of what exactly the problem is. Looking for the broader discourses behind the solutions proposed in different eco-city initiatives may reveal these different ideas.

The discourse of the eco-city

Hajer (1995) defines discourse as “a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is giving to physical and social realities” (44).

In the social sciences, discourse analysis is used to study the way in which issues and understandings are socially constructed. It does so through the analysis of both statements, and the context in which those statements are made (Hajer 1995). A number of authors have demonstrated the value of discourse analysis to understanding how planning decisions are made (Kumar & Pallathucheril 2004; Portugali & Alfasi 2008). Similarly, in the field of environmental sociology, discourse analysis is used to explore the way that actors construct environmental issues (Dryzek 2005; Hajer 1995).

Discourse analysis can reveal the way in which problems are constructed. In the study of eco-cities then discourse analysis can reveal the basis of their claims that they can make cities more sustainable. Does the answer lie in particular aspects of their design? If so, which ones? Or does it lie in the way they are governed, or their citizens involved in decision making? All of these issues are subject to significant debate. How do the designers of eco-cities answer these questions? And, among eco-cities, is there any convergence around a particular set of answers? If there were, this would help identify what exactly it means to be an eco-city. These questions are pursued by looking at five categories of discourse about urban development and sustainability, each of which is explained below.

Category 1: Type of sustainability: economic, social or environmental?

Much of the discourse about sustainability talks about it as consisting of three dimensions: environmental, social, and economic. Ideally, for sustainability to be achieved, these dimensions need to be in balance. Is that actually the case in eco-city projects or does one dimension dominate?

Category 2: Which actors drive the eco-city?

The question of who should be involved in the development of an eco-city is also central to understanding its vision. Several categories of actors are frequently involved in large-scale planning projects. These are the private sector, individuals, civil society and community groups, government actors and expert advisors. What role do different types of actors play in shaping, developing and operating the project?

Category 3: Eco-city as a model or eco-city as an educational tool?

Given that the eco-city is a relatively new and ambitious model of urban development, one could anticipate that the actors involved would see it as more than just a place to live. On the one hand the eco-city could be about presenting a new model of sustainable urban living to the world, something to be replicated in other locations. On the other hand more emphasis could be put on using the eco-city as an educational tool. In this case the eco-city could, for instance, be used to increase the awareness of local residents and / or the public about sustainability.

Category 4: Behaviour change as solution or technology and design as solution?

How can an eco-city help achieve sustainability? In considering existing sustainable urban projects, there appear to be three ways for it to do this. First, inhabitants can be encouraged to change their behaviour in order to live more sustainably. The other possibilities are connected to technological solutions, which can be used in two different ways. Production focused solutions incorporate technologies to generate renewable energy into an eco-city.

Consumption focused solutions use technology and design to decrease the demand for resources, for instance through passive ventilation.

Category 5: Sustainability by design or management and governance?

Following from the above, the last category suggested relates to the role given to design versus governance in reaching sustainability in eco-cities. On the one hand, eco-cities may see sustainability as resulting from efforts made during the design phase: a city is an eco-city because it has been designed as such. On the other hand, being an eco-city may also depend on the way it will be managed and governed after project completion: a city is an eco-city because it is governed as such.

METHODOLOGY

The approach taken in this research was to analyse a set of documents for six different eco-cities in order to identify how and whether they talked about each of the issues identified above.

Selection of cases

In this paper eco-city is used as an umbrella term. As such, some projects labelled “eco-district” or “eco-village” are also considered here as eco-city projects. Joss’s list of 79 was the starting point in selecting the cases for analysis. We then shortlisted projects on the basis of project type, size and ambition, and document availability. We eliminated eco-city initiatives in existing urban areas, focusing instead on urban projects that were developed from the beginning with strong eco or sustainability objectives. Projects also had to house at least 100 people and have a minimum of two land uses (i.e. residential and commercial). Having narrowed down the list, we then looked for a range of sizes and geographical locations. Through this process of elimination we were able to shortlist Joss’s list to 22 projects. The next step was to identify the projects for which there was sufficient information available in the public realm and in English to do an analysis. This was to ensure that we had an adequate number of documents to analyse. Through this process we were also able to eliminate a number of projects that were clearly highly speculative. Ultimately, we settled for six eco-city projects. Table 1 lists each of the selected projects as well as some basic information about them.

Selection of documents for analysis

We selected three documents to analyse for each project. To ensure that the analysis would evaluate the projects on the basis of their basic characteristics and perceived virtues, we ruled out any documents that were critical, and used only documents that described the projects in neutral or positive terms. The documents range in length from 360 words to over 2000. The sources used also varied, and included professional magazines, online databases about sustainable planning, project websites, academic publications, and online magazines. A list of the documents used to analyse each project is presented in table 2.

Table 1: Summary of projects analysed

Project	Location	Description	Status
Dongtan Eco-City	Shanghai, China	Dongtan, promoted as the world's first eco-city, was planned for an 86 km ² site near Shanghai. The British engineering firm Arup designed the city for the Shanghai Industrial Investment Corporation (SIIC), a public-private partnership and the commercial enterprise arm of the Shanghai municipal government.	Unbuilt
Masdar City	Abu Dhabi, United Arab Emirates	Masdar City, planned for a 1,483-acre site in Abu Dhabi, was designed by a consortium of British firms led by Foster and Partners Architects, for the Abu Dhabi Future Energy Company. The city, which originally aimed to be zero-carbon and zero-waste, will provide a home and testing ground for Abu Dhabi's Masdar Initiative, which aims to develop Abu Dhabi as a major energy research centre.	Under construction
Sonoma Mountain Village	Northern California, USA	Sonoma Mountain Village is a 200 acre mixed-use development on a former industrial site in California. It is initiated and financed by the investment holding company Coding. The project aims to integrate the principles of New Urbanism with the One Planet Living framework developed by the environmental charity BioRegional.	Under construction
Hammarby Sjöstad	Stockholm, Sweden	Hammarby Sjöstad is a 200 hectare development initiated and steered by the City of Stockholm. When complete the development will have about 10,000 residential units and 350,000 m ² of commercial space, with about 35,000 people living and/or working in the area. In the district strong efforts have been made to close the material and energy cycle.	Mostly completed
Eco-Village at Ithaca	State of New York, USA	A small cohousing scheme of 96 homes in Ithaca, New York with shared facilities, collaborative decision making and energy efficient buildings.	Completed & being expanded
Western Harbour, Bo01	Malmö, Sweden	This district of 160 hectares is built on reclaimed industrial land and has room for 600 dwellings, offices and shops. It was developed in the context of the European Housing Expo that was held in Malmo in 2001.	Completed

Table 2: Documents analysed for each project*

Project	Documents analysed
Dongtan Eco-City	<ul style="list-style-type: none"> • (Bullivant 2007): <i>Professional magazine / journal</i> • (Hart 2007): <i>Professional magazine / journal</i> • (Danish Architecture Foundation n.d.): <i>Good practice database</i>
Masdar City	<ul style="list-style-type: none"> • (Masdar n.d.): <i>Project website</i> • (Foster & Partners n.d.): <i>Website of the designing firm</i> • (Nader 2009): <i>Academic publication by a project backer</i>
Sonoma Mountain Village	<ul style="list-style-type: none"> • Peters 2009: <i>Online magazine</i> • McCabe 2010: <i>Professional magazine / journal</i> • Langdon 2010: <i>Professional newsletter</i>
Hammarby Sjöstad	<ul style="list-style-type: none"> • Fränne, 2007: <i>Brochure developed for the city</i> • Pandis and Brandt, 2010: <i>Academic publication</i> • Natrass, and Altomare, undated: <i>Good practice database</i>
Eco-Village at Ithaca	<ul style="list-style-type: none"> • ecovillageithaca.org: <i>Project website</i> • Jackson, undated: <i>Professional magazine</i> • Fellowship of intentional community, 2009: <i>Online magazine</i>
Malmo Western Harbour, Bo01	<ul style="list-style-type: none"> • Beer, undated: <i>Online magazine</i> • EnergyCite, undated: <i>Good practice database</i> • City of Malmö, undated: <i>Project website</i>

* for full bibliographic information refer to the references at the end of this paper

Search terms

To help identify statements expressing each of the discourses developed above, we developed a list of words that, if used, were likely indicated the presence of that discourse. For example, for eco-city as an exemplar project, we searched the text for words such as model, exemplar, template, replicate, and first. Using a simple software tool, Textstat, freely available from the Freie Universität Berlin, we identified how many times each of these words was mentioned. This helped us identify each instance in which that particular discourse was mentioned. A full list of all search terms is included in table 3. Each time we saw a word mentioned, we then checked the context in which they were used to make sure that only those that had a connection with the discourse were counted. Moreover, we also made sure that words would not be counted twice (e.g. renewable technology). This enabled us to compile a database of all instances in which each project was discussed (for instance) as an exemplar. For the category “behaviour as change” however, a different methodology was followed. Identifying in the various discourses attempts at behavioural change would be too limited if the analysis was restricted to specific words such as behaviour or consume. Instead, we undertook a manual content analysis, carefully reading through the documents and looking for instances where behavioural change was suggested.

From this database we compiled a frequency table (see table 4). From the relative frequencies with which each discourse was mentioned, we then were able to make some initial conclusions about the ideologies of each of the eco-city projects analysed. It is important to note that these are general conclusions based on a qualitative approach and should not be interpreted as having undergone tests for statistical significance.

Table 3: Search terms used for the analysis of the eco-city projects

Category 1	Search terms
Environmental sustainability	Environment, nature, ecology, preservation, wildlife, biodiversity, green, renewable, efficient, reduce, passive
Social sustainability	Social, accessible, affordable, culture, diverse, attractive, equity, participate, health, spirituality
Economic sustainability	Economy, industry, commercial, employment, company, business, work, financial, job
Category 2	Search terms
Actors: private sector	Company, business, industry, developer, private, architect, contractor
Actors: individuals	People, residents, inhabitants, public, individual, society, everyone
Actors: community / civil society	Participation, resident, community, involvement
Actors: government	State, government, authorities, official, politicians
Actors: experts	Expert, consultant, university
Category 3	Search terms
Eco-city as exemplar	Model, exemplar, template, first, replicate, prototype, inspire, paradigm, experience, communicate, demonstrate
Eco-city as education	Educate, teach, workshop, training, student, campaign, information, tour, engage, visit, course, knowledge
Category 4	Search terms
Behaviour change as solution	Manual content analysis
Technology & design as solution: production-focused	Generation, renewable, technology, CHP, solar, wind, biomass, design infrastructure, photovoltaic, production
Technology & design as solution: consumption-focused	Efficient, reduce, design, needs, diminish, insulate, minimize, saving, passive
Category 5	Search terms
Achieving sustainability through design	Architect, engineer, design, plan, masterplan
Achieving sustainability through management and governance	Manage, operate

FINDINGS

Table 4 presents a summary of our analysis of the sets of documents for each of the six projects. For each project it lists how many statements we found that reflected each discourse. The type of statement that was dominant in each category is indicated by putting the relevant number in bold.

Table 5 summarises the results in each category for the six projects. We concluded that a particular discourse could be seen as dominant if that discourse was used at least twice as often as the others in that category. Dominant discourses are identified by the words in bold text. Table 6 presents the same results summary, however here the highlighted terms are those two categories that were mentioned most *overall* in the texts. The results are discussed in more detail below.

Table 4: Frequencies

	Dongtan	Masdar	Sonoma Mountain	Hammarby Sjöstad	Eco-village Ithaca	Western Harbour, Bo01
Category 1: Type of sustainability						
Environmental	37	24	28	76	28	64
Social	8	1	10	12	33	5
Economic	12	26	13	8	6	11
Category 2: Actors						
Private sector	5	5	30	16	2	34
Individuals	9	3	18	37	12	23
Community / civil society	1	0	0	4	59	0
Government	6	6	3	16	0	12
Experts	16	0	8	0	4	1
Category 3: Model or Educational tool?						
Model	17	4	9	10	18	21
Education	2	0	1	28	51	13
Category 4: Solution focus						
Technology & design: production	24	16	17	110	8	53
Technology & design: consumption	15	26	15	51	23	8
Behaviour change	2	0	1	5	0	0
Category 5: How to achieve sustainability						
Design	21	16	8	39	20	37
Management	0	0	0	0	0	0
Total amount of words in the text	About 4100	Almost 3000	Almost 3200	Almost 11,000	About 6,700	About 6,000

Economic, social or environmental sustainability?

In four out of six projects, discourses of environmental sustainability clearly dominated over economic and social. For three projects, Hammarby, Dongtan and Malmö, it was strongly dominant, and even for the two projects where it was not mentioned most, it was a close second. It appears then that the environmental dimension of sustainability is important to the eco-city. Looking at the text, the importance of decreasing the environmental footprint of urban areas is a clear theme. For instance, for Hammarby Sjöstad, the goal for the district is to be “twice as good in relation to what goes for the best applied technology in today’s new building design.”

Masdar & Ithaca are interesting in their emphasis on different aspects of sustainability. Masdar’s frequent mention of economic issues makes sense given that the city is presented as a vehicle for developing a renewable energy industry in Abu Dhabi. In this case, sustainability starts to be seen as a source of economic development. Ithaca’s emphasis on social sustainability also seems to derive from the underlying aims of the project. The Ithaca website states that “as residents, [they] are engaged in a fascinating social experiment.” This emphasis on social issues was unique among the cases studied.

Which actors drive the eco-city?

In the case of the actors that are playing a role in the eco-city, we found very few similarities among the projects. Each project seemed to focus on different actors. One interesting outcome was the impact that having a particular actor associated with the project had on the results. This can be seen in the case of Dongtan, where the designers Arup were mentioned many times and contributed to the dominance of the expert category. This was also the case for Sonoma Mountain Village, where the developer, Coddling Enterprises, was also mentioned frequently and contributed to the dominance of the private sector as actor in the results for that project.

Mention of a category of actor did not necessarily seem to indicate it would be involved in shaping the project. In Hammarby the category the most frequently mentioned was individuals (37 times). For instance, one text stated that “all solutions have to be adapted to the needs of local residents.” This seems to indicate that the future residents played a central role when designing the district and that it is built for them. However, the involvement of residents or inhabitants in the design of the district is only mentioned 4 times.

In this category Ithaca again stands apart from the other projects, with the community / civil society category coming up most frequently. Moreover, out of the 14 sub-categories of discourses examined in the analysis, it is the one most often used in the texts about Ithaca. From this it would appear that in projects where social sustainability is central, community groups might be more involved in the project.

Eco-city as a model or eco-city as an educational tool?

Each of the six projects is described multiple times as a model or example. A text written by the builders of Ithaca states “Our goal is to build a replicable model of a cooperative, environmentally sensitive village.” In the case of Malmö, one text states that “the aim is to make Västra Hamnen an international leading example of a densely populated, environmentally sound neighbourhood.” Masdar City is described as “a model for future development” and “the role model for the world,” Dongtan as “a global template for sustainability in urban planning,” and a “prototype for the future of all cities.”

When talking about the eco-city, four cities see themselves mainly as exemplars (Dongtan, Masdar, Sonoma and Malmo) while Hammarby Sjöstad and Ithaca are more focused on education. Somewhat surprising given that the Masdar Institute is heavily focused on research into renewable energy is that for this project the eco-city as an educational tool is not mentioned a single time. The project with the strongest emphasis on education is Ithaca, where this discourse was the second most mentioned of all the categories searched for. The eco-city as an educational tool appears as a crucial element of the discourse of the project. Actors involved in this project even talk about their “educational style.”

Behaviour change as solution or technology and design as solution?

The use of technology and design are among the most frequently mentioned categories for all of the projects. In fact, every project studied mentions using technology and design as a way of achieving sustainability. However there was some variety in emphasis between projects when it came to whether this was for the production of renewable energy or the reduction of consumption. For four of the six projects, the use of technology and design was focused on developing more sustainable means of energy production. The two projects where environmental sustainability did not dominate over all the other dimensions, Ithaca and Masdar, were also the two most focused on using design and technology towards reducing consumption.

That said, Masdar and Ithaca have different ideas about how to reduce consumption. Intelligent design, the “latest high-tech monitoring systems” and “cutting edge technology” are described as helping to ensure that “Masdar City’s use of resources will be far lower than that in conventionally designed communities.” In Ithaca however, “passive solar design” or “south-facing courtyards with deciduous vines minimiz[ing] overheating in warmer months” are mentioned as “strategies to achieve high energy efficiency.” These extracts also highlight another point. When discussing reducing consumption, the texts focus on doing so through design. The need for residents to change their behaviour almost never came up in any of the texts. Instead, there is a recurring theme of making sustainable living effortless for residents. A text about Sonoma Mountain village for instance says that “the community is based on the premise that an ordinary resident will be able to live there sustainably with little extra effort.”

Achieving sustainability through design; achieving sustainability through operation / governance

The one consistent result emerging out of the entire analysis is that in all of the cases, design is much more frequently mentioned than management as a driver of sustainability. Even in the case of Ithaca, while the texts suggested that governance is also important, it was not specifically mentioned.

DISCUSSION

The sheer diversity of approaches to creating an ecological or sustainable urban development found even in this small study would seem to indicate that, for the moment, there is no standard definition of what an eco-city is. Despite this diversity, it is still possible to draw out a few commonalities between all the projects. First, there was the overwhelming focus on

achieving sustainability through technology and design and the lack of attention paid to the ongoing government and management of these projects. That the notion of governance is not even mentioned in any of the cases studied is interesting when considering the increasing body of literature dealing with the notion of governance for sustainability. This may be related to the preference for a design-led approach to developing an eco-city. This leads to the question of whether the entire proposition of the eco-city is based on an excessively physically deterministic approach to planning.

Regarding strategies for achieving sustainability, again the projects' focus on design and technology dominated, this time over strategies to change the behaviour of inhabitants. Technology is in all cases used to deal both with consumption and production. However, no real patterns emerged about which of the two should be focused on. Finally, in most of the cases, one or both of these clearly appeared as one of the main discourses used to describe the project. This seems to indicate that technology is an inherent aspect of eco-city development and that it is seen as having a crucial role to play in achieving sustainability.

A third point of convergence among the projects studied was that they all aimed, in some way, to be seen as models or examples of urban sustainability. In some cases this ambition was more pronounced than in others but it was nonetheless always present. Additionally, the projects often discuss an ambition to be seen as models on a global, not just local scale. While most projects did not speak about education, in this sense they could all be seen as wishing to educate the world at large on what a new breed of ecological urban development looks like. This fits with a growing trend where places like Hammarby are becoming case studies of 'good practice' and field trip destinations for students of sustainable urbanism.

Finally there was the emphasis on environmental sustainability. Even for the two projects where other types of sustainability were more frequently mentioned, the environment was still a strong theme. This could reflect the challenge of incorporating economic and social issues into a design-led approach. Perhaps the designers of eco-cities are simply more experienced with and knowledgeable about how to address environmental issues. In the documents on Dongtan, which discuss environmental issues with great confidence, social and economic proposals are often couched in speculative language, e.g. the planners 'envisage' that local employment will be generated and 'feel that the Chinese should maintain local fishing and farming.'

The results presented in this paper are very preliminary and based on an analysis of only six eco-city projects, and there are some limitations to the methodology used. First, the requirement that documents be available in English limited the selection of cases. Second, the total amount of words analysed for each case differed quite significantly with the largest nearly 11,000 words and the smallest only 3,200. This was in part due to difficulties finding a balanced array of documents for each project. Despite these limitations, we believe the insights gained from this study can help progress an understanding of the ideologies behind of eco-city projects, and hope that the study has produced results which will be useful in directing further research.

CONCLUSION

The analysis in this paper demonstrated that there is a great deal of diversity among projects considered to be eco-cities. By looking for particular themes in the discourse about these

projects, we have demonstrated that this diversity goes beyond just their size, location and ambition. Indeed, it expands to their vision of what a sustainable urban future looks like, the techniques that planners and designers should use to achieve it, and the actors who should be involved.

We propose that this diversity may in fact be a good thing. As much as each of these projects wants to be seen as a model, perhaps it is better to accept that there is no single solution for making urban living more sustainable. In this sense, it is better to think of the eco-city as an ambition, an objective that there will be multiple ways to achieve. Many lessons can be learned from studying each project, both in isolation and in comparison with others. As time goes on and more eco-city projects are actually built, this diversity will allow for interesting and instructive comparisons.

The above may make it seem that we are remaining somewhat agnostic about the quality of these projects in relation to their sustainability goals. While our objective was to reveal rather than judge, we can make what we hope will be some critically constructive comments about the projects studied. We are concerned about the lack of attention to ongoing governance and management of projects, and to the idea that people might need to change their behaviour. These characteristics could reflect a hesitance to engage with the more challenging and aspects of making urban living more sustainable. Perhaps the designers and developers behind these projects believe that these issues are beyond their remit, but we would counter that those interested in a comprehensive approach to sustainability must take them into account.

We hope that this paper will provide the grounding for further more in-depth research on eco-cities. We would particularly like to encourage qualitative analyses of the type that we have attempted, which try to uncover some of the underlying assumptions behind high profile projects. One reason for this is that as the demand for practical ideas about how to make urban living more sustainable increases, these projects are likely to get increasing attention from policy makers and practitioners around the world. Further research should focus on providing the information that these people will need to make informed decisions about how to achieve the eco-city objective in their own context.

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