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# The Emergence and Spread of Eco-urban Developments Around the World

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**Abstract:** Neighbourhood scale sustainability districts are appearing in an array of cities around the world (Barton 2000; Barton et al. 1995; Taylor 2000; Winston 2009; Jabareen 2006). They are promoted as part of urban sustainability plans and strategies within formal government, advanced by private developers driven by profit and niche marketing motivations, and advocated for by citizens groups as part of sustainability, climate change, and affordable housing action strategies. In modern times, efforts to construct sustainable alternative neighbourhood scale developments date to isolated voluntary initiatives in 1970s Europe and the United States. Since about 2006, they have increased rapidly in popularity. They now go by many names: ecodistricts, écoquartiers, eco-cities, zero/low-carbon/carbon-positive cities, ecopolises, One Planet Communities and solar cities. These are other varieties of ecourban developments have become frames – sometimes the dominant frame -- used to justify and orient the construction of new pieces of city in a growing range of

countries worldwide (Joss et al. 2013; Chang and Sheppard 2013). This paper documents our work to catalogue such ecourban developments worldwide.

The compendium we are producing provides evidence that ecourban developments today are part of a movement toward green global cosmopolitanism (Blok 2012) through a number of standards competing for a key role in redefining relevant and meaningful sustainability efforts in specific economic, political, social and design-based terms. At the same time, and for many of the same projects, they also respond to strictly local challenges and opportunities and express themselves in fragmented ways in different world regions. We will also document the ways in which ecourban developments both respond to a crisis in urban development and create new crises, both respond to the need for greener, cleaner, less extractive modes of life and create a host of new ecological and climate contradictions. The ways in which ecourban developments respond to global standards and local contexts, urban development crises and ecological crises, also of course will vary in different contexts where they are beginning to appear around the world. Their variability along these axes forces us to ask whether ecourban developments are intended to "fit in" to the existing cities in which they are springing to life, or whether they are, rather, intended primarily to "break free" from or even "fix" crises springing up from within these existing cities. Our catalogue of eco-urban developments around the world will serve as a first step to a deeper understanding of these social and political dynamics and trends at global and regional scales.

**Keywords:** eco-urbanism, eco-districts, green building, sustainable neighborhood development

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## 1. Introduction

Ecodistricts, écoquartiers, eco-cities, zero, low-carbon and carbon-positive cities, ecopolis (Downton 2009), One Planet Communities and solar cities, are now on the rise worldwide. Research by Joss et al. (2013) into the related idea of eco-cities documented the existence of 178 unique policies and initiatives. More than 100 municipal governments in China are proposing to build eco-cities, many of them on greenfield sites on the urban fringe (World Bank 2009); Charlot-Valdieu and Outrequin (2009, 2011) document 33 'écoquartiers' in France. The term 'écoquartier' was first defined in a policy context in 2008 by the French Environment Round Table, as "a sustainable neighbourhood which responds to considerations relating to transport, urban density and layout, green building, social diversity, mixed-use development and the involvement of the local population" (Min. de l'Ecologie 2012; Sabard 2012). Research by Criterion Planners published in September, 2014 has documented 54 different tools being used in a total of 22 countries in order to assess the sustainability features and performance of different sustainable built environment projects. The definition used to make this tally of Urban Sustainability Rating Tools was of stand-alone, voluntary (not regulated within formal law or policy) procedures offered publicly (rather than as a proprietary tool by a contracted firm). The first such tools appeared in 2004 (e.g. CEEQUAL, China EcoCity) and one (AARP Livability Index) is

noted as in development with an intended release of 2015. These 54 tools are classified into five tool families, namely: cities (e.g. STAR Communities), neighbourhoods (planned, existing, and all-inclusive; e.g. LEED-ND), landscapes and parks (e.g. SITES), transportation and infrastructure (e.g. Envision), and special purposes (e.g. AASHE STARS).

As a set of planning, design, and technological arrangements for living in particular newly-developed neighbourhoods, and as a new ideal for both urbane living and for green and healthy living, ecourban developments are at present demonstrating a rapid growth in popularity. We have come a long distance from 2010, when renowned architect Norman Foster could ask, reflecting on his pathbreaking project to build a zero-carbon city in the Arabian Desert: "The shocking thing about Masdar is that it is the only one; that there aren't more Masdars." As aspirational and world class model sustainable community developments take off now in many countries around the world, it is a useful moment to examine the motivations for pursuing these projects from the array of actors involved; and the trends toward standardization and fragmentation of practices and approaches in planning, design and architecture, and urban development.

Ecourban developments have been portrayed as an evolution from new urbanist and 'urban village' models towards incorporation of urban modes of living: higher densities, brownfield sites, intensity of mixed use and social mix, more active discouragement of the use of private automobiles and more encouragement of active and public transportation. Concepts like environmental and energy conservation in building and infrastructure design, integrated design of buildings, infrastructure, and the public realm, a move toward local self-reliance with regard to food, energy, water, and waste, are emerging with importance (Winston 2009). These developments have been heralded as demonstrating "the value of partnership, voluntary sector drive, private sector funding and local authority facilitation" (Winston 2009, 1792, citing Barton and Kleiner 2000), as well as local citizen participation. However, "as with the other approaches, successful projects have led to problems of affordability and exclusion for those on lower incomes" (Barton 2000 in Winston 2009, 1792).

## 2. Research questions

A new compendium of ecourban developments around the world can help us to investigate answers to the following questions, as this movement gains momentum in changing the look, feel, and values of our cities. The compendium we are developing will answer the following questions:

- What are the geographic spread and distribution trends of ecourban developments?
- How are ecourban developments being pursued and delivered over time?
- What different spatial themes, structures and features appear most prominently in ecourban developments, across what categories of sustainability, resilience, urbanism, and related ideas?
- How and how much are national, international, and industry standards, protocols and frameworks being used in ecourban developments?
- This compendium will also be the starting point for further case study research into particular ecourban developments that will address the additional questions of:
- How do the rationales offered for ecourban developments change depending on: people involved, place, leadership, institutions, place-specific history?

- How are these rationales justified differently by different groups involved? What are the implications for the "success" of the ecourban development?
- What norms, values and understandings of neighbourhood and community are being advanced in particular new ecourban developments, and absorbed by residents? How do they differ from those in the existing city as a whole?
- How can we better measure and track the performance of ecourban developments in terms of the three preceding points, at the global scale, via the compendium?

## 3. Ecourbanism as reinvestment and reinvention of cities

A number of efforts have already been made to track emergent trends and categories of ecourban developments. Joss et al. (2013: 56; Joss 2011) categorize eco-cities in terms of a descriptive distinction of their "main implementation mode," "technological innovation," "integrated sustainability plan" and "civic engagement." Based on this description, Joss et al. (2013) make a case for the emergence of a single hegemonic ecocity model. They stop short, however, of making judgments or seeking consensus on the relative values of pursuing any particular model or outcome. This is similar to the approach taken by Souami (2009), who considers 60 European écoquartiers and identifies two distinctive models operating: the northern European model (Sweden, Germany, Netherlands) with an emphasis on strong environmental standards; and the southern European model (France, Italy, Spain) in which urban revitalization and heritage preservation are also key. Research on emergent Asian eco-cities suggests a distinct emphasis on technological innovation approach and Asian notions of the "post-suburban" (Wu 2012; Chang & Sheppard 2013). Differences amongst these and other variations on ecocity models relate to the mixing of urban revitalization and urban sustainability goals, which carry divergent results for different groups with claims to the urban environment, including nonhuman nature (Newton 2012; Winston 2009).

We consider ecourbanism to be a phenomenon of both push and pull, from the two primary directions of urban revitalization (that we will call econ-urbanism here) and urban sustainability (that we will call ecol-urbanism here). On the one hand (econ-urbanism), it is being driven by a pull for innovation in the realm of urban planning and development, architecture and design; and a push for adequate responses to converging crises in urban development and the demand for resilience in the face of climate change, related to a shake-up in capital relations in the past decade. On the other hand (ecol-urbanism), it is a kind of emancipatory and radical project aimed at altering human-nature relations in the city and crafting a new urban form and urban lifestyle opportunity structure that would permit non-destruction, even restoration of non-human environments even as they offer new value to socio-cultural lifestyles that ecourbanists are able to live. These two motivations for pursuing ecourban development are both converging and diverging. We will discuss the basis of the justification for econ-urbanism, the basis of the justification for ecol-urbanism, and then presented arguments about both conflict and potential convergence between the two models, next.

### *3.1 Econ-urbanism: The case for ecourbanism as reinvesting in urban redevelopment*

Econ-urban redevelopment projects are pursued to revitalize and 'grow' cities, aiming to capture hidden value by reclaiming and transforming land once considered a liability (Malone 1996; Norcliffe et al. 1996; Alker et al. 2000; Marshall 2001; Millspaugh 2003; Desfor & Jorgensen 2004; Dovey

2005; Bunting & Rutherford 2006; Lejano & Wessels 2006; Butler 2007; Bunce & Desfor 2007; Desfor et al. 2011; Brownill 2011). Referring to the large subset of these projects that are redeveloping urban waterfront districts, Desfor and Laidley (2011, 3) state: "projects have been hailed both as spaces of promise and as crucial territorial wedges in twenty-first century competitive growth strategies. Large investments have been made, and more are being planned, in urban waterfront development projects intended to transform derelict docklands into communities of hope with sustainable urban economies." The impulse to find new means to profit from underused lands in a postindustrial urban development context is obvious. The land is infill, meaning that it has built or policy constraints from previous development that need to be dealt with before the new development can proceed. In many cases, it is also 'brownfield,' meaning that it requires environmental remediation of previous damage done before it can be redeveloped (Alker et al., 2000). These sites often present a legacy of environmental pollution, social and economic injustice, that must be remediated and somehow redressed in the redevelopment process, which frequently combines values of the public sphere and the private sector (Lejano & Wessels, 2006, 1472). Sometimes redevelopment is motivated by the needs of disadvantaged on-site populations for remediated land, upgraded infrastructure, and modernized housing (Alker et al, 2000; Lejano and Wessels, 2006; Fainstein, 2010). But more generally, as the availability of greenfield land diminishes in many urban regions, and as the value of core urban land increases, the value of redevelopment on infill land becomes increasingly apparent.

From 1981 to 1998, London Docklands Development Corporation established the prototype for a form and ethic of urban redevelopment that reproduced across Europe, North America, and beyond, with comparable results (Bunting and Rutherford, 2006; Brownill, 2011). Since the 1980s, such urban redevelopment strategies have become popular strategies with often similar governance and design principles: engaging the private-sector; using special development authorities; offering a post-industrial land use mix; numerous amenities and high residential density; targeting particular segments of the population with particular lifestyle preferences. The governance of econ-urban developments emphasizes partnerships, and the integration of knowledge types in a non-technocratic and collaborative manner. The process usually involves some explicit attention to questions of equity and distribution, for the mutual gain of the involved developers, envisaged new users of the space for living, working or playing, and for the city as a whole. Within an overall political context of devolution of responsibility to local authorities and concomitant demands for improved relationships with local citizens, the institutionalization of these new planning and policy processes has opaque or ambiguous results (Wessells 2010).

At one level, econ-urban projects are efforts to maximize the economic potential of real estate in an emergent new economic order, a continuation of an urban economic development agenda that has been in place since the postindustrial turn of the 1970s (Heeg, 2011). In this domain, Susan Fainstein (2010, 2) quotes former mayor of London Ken Livingstone as saying: "as soon as you stop building you lose out." At the same time, this explanation of the recent explosion of ecourban redevelopment districts is not sufficient, as these precincts also produce a unique kind of urban/natural landscape, the vision for which has changed remarkably over the past 100 years (Desfor, 2011). While reference to notions of the public interest and nature have been constant, interpretations are undergoing metamorphosis (Stevens, 2011). The shift is from a utilitarian view of the waterfront to a view of the waterfront and the neighbourhoods being sited there in much more aspirational terms. Often, these aspirations are for

place-based lifestyle and identity values, framed as liveability, sustainability, and other slippery, holistic notions.

These econ-urban projects have also faced harsh criticisms from a variety of sources about their: cost overruns, circumventing of normal planning and development processes, poor quality results and diminished performance compared to expectations at the outset. Bunker (2009) describes the transition toward this urban redevelopment approach in the Australian context toward an open, globalized economy, emphasizing free global movement of goods and people. As this model expanded its reach, citizen critiques of its impact on governance institutions and processes, and in particular qualities of transparency, accountability, public engagement and civic values have expanded in step. Complaints that urban redevelopment are stymied by slow and inertia-prone public and private sector regulators and developers, are matched by other complaints that these developments proceed with a surfeit of efficiency and a deficit of care for quality or concern for context. While the special urban development authority is argued to be a crucial tool in order to avoid NIMBY-style resistance to major change and to fast track through conservative-tending local government development regulations, the level of control exercised by development authorities can leave the local government in the role of a critic, rather than an agent responsible for the district's success, and leave citizens in the role of outsider, to the extent that they are not consumers. In some instances, it is difficult to distinguish complaints about the particular approach and form of the redevelopment projects from negative public attitudes, more generally, about densification and increased populations in established neighbourhoods. In other instances, particular infill or "brownfield" redevelopment sites are considered prime for densification because they are buffered from neighbourhood complaints due to their location. An article in The Atlantic City Lab claims, referring to The Wharf development in Washington DC's southwest, "You can't just do this kind of dense mixed-use urban waterfront everywhere" (Capps 2012).

Despite widespread critiques of inscrutable behavior by public and private agencies, negative attitudes and perceptions among citizens, and poor design and performance outcomes of econ-urban developments, these types of developments are continuing to be pursued. In the context of the UK, the Urban Regeneration Program has been linked explicitly to government goals under the framework of Sustainable Communities. In 2003, the Sustainable Communities Plan was passed as "the government framework for tackling deprivation and the shortage of affordable housing by delivering successful, thriving and inclusive communities in all regions" (Bunker 2009). Making a new move in the direction of awareness of the social consequences of ecourban development, the core explicit notion of sustainable communities being addressed in this plan is that: "most importantly, sustainable communities must offer decent homes at prices people can afford" (McDonald et al., 2009, 50).

The Chinese government refers now to 'eco-civilization' as a means to right the challenges emerging in social, economic and environmental consequences of its rapid economic growth of the past three decades. In line with the econ-urban model, the terms in which the government of China proposes to achieve eco-civilization include cross-cutting reforms toward greater use of market mechanisms, and a more open and less regulated economy, alongside resource conservation, renewable energy development, and environmental protection. In its annual parliamentary meeting in late 2013, the Chinese government announced that it would both build "a resource-saving and environment-friendly society based on the environmental carrying capacity of resources, the laws of nature and sustainable development" and that it would double GDP and income per capita from 2010 to 2020 (The Climate Group 2014, p.3).

*3.2 Ecol-urbanism: The case for eco-urbanism within the environmental politics of transformation*

Environmental conservation and preservation movements emerged in contemporary society in the 1960s, identifying the need to reduce some combination of human population, affluence, and technology in order to limit and reduce human-caused environmental destruction and compromise of climate system stability. Ecourban development as a theory of how ecological living could be brought to urban communities is credited to Richard Register, working in Berkeley, California in the 1970s (Ecocity Builders 2014). His and other early ecological urban development principles recommended mixed land-use and compact development, the reprioritization of infrastructure principles to favour pedestrian and active and public transportation modes over the automobile, and emphasized the need to restore damaged urban environments. Early principles also included notions of socially and ecologically just economic development, local agriculture and local resource conservation and reduction of pollution (Roseland, 1997). An additional key to ecovillage and eco-city concepts was that they were inhabited by "intentional communities," or "residential group[s] that come together for some shared purpose or intention" (GEN-Europe n.d.), whether such groups pre-date residency in the eco-city or form in situ. Many of today's sustainable neighbourhood development frameworks echo similar principles, with the added focus on reducing greenhouse gas emissions and improving resilience to climate change threats. A Luddite economics of 'small and local is beautiful' typically accompanies this approach to ecourban developments, marking a stark contrast with the economic proposition of growth behind the redevelopment approach.

Currently, reports from the United Nations Environment Program (2012, 2011), the World Bank (2010), and the OECD Green Cities Program all proclaim that the only climate-safe future lies in urban sustainability. Cities are of particular interest as they have direct control over critical sources of greenhouse gas emissions (Betsill 2001; Bulkeley & Betsill 2003) and are the sites where the potentially catastrophic impacts of climate change will first play out (Wilbanks & Sathaye 2007). It is therefore in urban infill projects that the greatest potential is proposed to exist to capitalize on infrastructure and built form efficiencies and also to create new cultural patterns of behaviour that may fit with the visions of low-impact urbane and sustainable living (Jabareen 2006).

Numerous concerns are also raised with regard to the ecological approach in ecourbanism. There is the straightforward technological complaint that they fail to perform to a high ecological efficiency level. This is exemplified by a comment made by a professional participant at the 2014 EcoDistrict Summit in Washington, DC: "I don't know of a single net zero neighbourhood that is actually performing that way." Second is a political complaint that ecol-urban neighbourhoods represent a higher level of expectations and aspirations than the results they are capable of delivering based on technological and design changes alone. That is, ecol-urban models represent implicit political and social promises whereas they are delivering only ecological and technological results. This can result in increasing rather than resolving political and social tensions about urban development and ecological trends in the city [1]. A third critique, coming from a political ecology perspective, is that the model and experimental nature of ecourban processes may lead to further disassociation of citizens from urban governance (Gibbs & Krueger 2007). Instead, ecol-urban experiments are considered to be forcibly increasing disparities in cities between the engaged and the excluded, the haves and the have nots. Specifically at issue is the inability of ecol-urban neighbourhoods so far to prioritize affordable housing, or to integrate new urban migrants and refugees. As 3 billion people will demand to be

accommodated in cities around the world in the coming decades, it seems like more than a “missed opportunity” to fail to include these new urban migrants in ecourbanist plans. Instead, the predominance of ecourban projects sit beside these overwhelming trends, in many cases ignoring the way in which they contribute to disparities and reinforcing divides between winners and losers in the emerging eco-economy [2].

From a social and political perspective, the prospect for change within ecol-urbanism comes from an idea about this new form and lifestyle context making space for a sustainability transition in society and governance. The field of research and policy known as transition management has emerged from this idea (DRIFT 2013; STRN 2010). Beginning from a socio-technical understanding of past societal transitions, the transition management approach makes recommendations for translate ecol-urbanism into the active management of a widescale transition toward sustainability (Smith & Kern, 2009; STRN, 2010a; Verbong & Loorbach, 2012; Loorbach, 2007; Smith & Kern, 2009). Smith et al. (2005) articulate the preconditions for such a transition in terms of: the articulation of selection pressures from the landscape scale, and adaptive capacity of the city or system based on resource availability and coordination. Relevant to the choice of a standardized compared to home-grown approach to the ecourban development, transitions can in this way be generated from within or from external structures and resources, although they will happen in a different way and at a different rate depending upon where the motive force is coming from. Hodson and Marvin (2009, p477), in their research amongst some of the world’s most powerful cities, found "strong evidence of expectations, aspirations and plans to undertake purposive socio-technical transitions," in line with sustainability and climate change adaptation and mitigation goals.

Transition theorists such as that of Smith et al. (2005) identify a number of factors that increase the potential for a system of governance to undergo an effective transition, in line with their adaptive capacity. They identify the volume and actions of ‘intermediaries,’ a broad group of actors who are not formal members of government but who work in partnership with government and with citizens to bridge the gap between policies and practices, as a crucial leverage point. It is intermediaries, equipped with a wide range of necessary knowledge types, effective and wide-ranging presence in local networks, and communication skills and credibility, that do the key work of developing and coordinating capacities for regime change at the urban level. In a successful intervention, for example, intermediaries would have been able to engage all stakeholders in the shared vision of sustainability for the ecol-urban neighbourhood, and aligned sufficient resources to move towards that vision (Hodson and Marvin, 2010). Why we should expect such intermediaries to be more prevalent in ecol-urban neighbourhoods compared to elsewhere in the city is more apparent when we consider the voluntary and idealistic roots of ecocities than when we consider many of the contemporary ecourban districts in our time.

### *3.3 Fitting in versus breaking free*

In general, we suggest that econ-urban projects aim to “fit” these projects with the existing city, its institutions and relationships, whereas ecol-urban projects aim to set themselves apart as a new kind of space for a new kind of urban living. Diving into the structure, thematic emphases and innovations, design qualities, and progress of these eco-urban developments reveals a trend of standardization as well as fragmentation and findings which have important implications for urban development and for

the pursuit of sustainability more broadly. Together, ecourban districts are changing the solution set we associate with unsustainable development trends at the same time as they change the face of our cities.

Jessop (2000) notes that critical comment on urban regeneration initiatives is fundamentally contradictory in almost all cases, insofar as critical analysis identifies particular failures, in major projects for example, but can simultaneously identify successes, specifically and most often "in terms of creating a … spectacle that could seemingly attract new postindustrial investment" (Cook and Ward 2012, 789). Within planning studies, ecourbanism might be considered to raise the bar initially set by the concept of the neighbourhood unit in the comprehensive rational planning tradition, with a trajectory of global impact that can be traced through Mumford (1961), Jacobs (1961), Lovelock (1987), Hough (1995), Soleri (Soleri & Strohmeier 2001), and Girardet (2004). Long-standing critiques of the neighbourhood unit are also relevant here: Herbert Gans, notably, argued that the physical determinism of neighbourhood units was an attempt to force interaction and congeniality upon neighbourhood residents, whereas instead they served as a means of social division, establishing boundaries between 'self-contained,' homogeneous entities (Vidyarthi 2010; Gans 1968). The history of the use of neighbourhood units warns of the risk of return to modernist planning principles and ideals.

Battle lines emerge between the modernist urge within the econ-urban camp and the ecological preservationist urge within the ecol-city camp. Importantly, these battle lines can sometimes emerge within the same project, as different actors on the same project can espouse different models for their development. Ecourban plans and results are often presented as "packaged examples that are ready for export" without considering the politics of urban transformation, and whose nature, sustainability, and liveability is served (Bradley et al. 2013, 190). Moreover, few policy and planning efforts toward realizing urban sustainable development explicitly question the need for continued economic growth, whether within the district or in society at large (Hajer 1995). Rarely addressed are the continuing community development demands within neighbourhoods where people live, work and play. However, ecourbanism is a political movement, and it has potentially exclusionary, inequitable, over-consuming, unsustainable outcomes in particular cases.

In a devastating critique of the modernist, econ-urban model, Vincent Renauld (2014) labels the generation of sustainable products, technologies and systems within ecourbanism as practiced in France as no more than a new ideology of modernism, a new mode of mass overproduction and overconsumption, which serves to solve the latest crisis of capitalism in the very generation of this new category of marketized products. This, he notes, is the stand required of the state and private developers in the production of these sites, even though they stand in stark contrast to the functioning of site features and design (savoir faire) and residents' understanding of how to use the sites' technologies and other features and how to live in these new kinds of neighbourhoods (savoir-vivre). By generating national competitions for the production of les écoquartiers, and through a suite of policy incentives designed to smooth their completion, France stands to capitalize on a growing market share in this new niche as production costs decrease via increased demand. He provides examples of residents who fight back in their incorporation of a few of these new technologies and products into their lives, such as vegetated balcony shades, eco-flooring, and their ongoing resident educational programming, with the effect of simultaneously reducing the ecological value of the technologies and reducing their economic value as well, because they were put in place without adequate consideration

of their social value (or lack thereof). These écoquartiers fail, according to Renauld, to transform neighbourhoods into different sets of social relationships because of their approach to forcing changes in residents' quotidian habits, without their consent or knowledge, and expecting this to be a matter of technical, rather than embedded and social, adjustment. While the changes to daily habits presumed by the introduction of the new forms, structures and technologies within ecourban districts are presented as beneficial in a straightforward manner, incorporating these changes into daily life actually requires a radical shift in most people's notions of home, of the division between public and private space and the types of activities that happen in each. The lack of treatment of this transformation as a social project means that as a social project, it is doomed to failure. And without success as a social (and political) project, success as an ecological or economic project is impossible. In sum, the evolution of ecourbanism, at least as practiced in France, suffers from a lack of adapted social and political practices, processes of integration, and justifications.

Compounding failures and inconsistencies in the contemporary urban redevelopment approach, coupled with a sense that many cities are in a similar situation, have led to calls, and some responses, to revise the model. Consensus has yet to emerge on what the ideal ecourban model should be, and maybe consensus on this can never emerge. A number of concepts are being employed as means to revise and refine the ecourban approach, some of which offer potential to reconcile the competing directions of econ- and ecol-urban models.

To take two prominent examples, organizing frameworks of both "ecohealth" and "resilience" appear to offer the prospect of a marriage between the two approaches to ecourbanism. In the case of ecohealth, the US EPA Healthy and Sustainable Communities Program has launched an EcoHealth Relationship Browser which is designed to allow people to connect matters of urban design and built form to personal matters of health. The implicit argument is that leveraging the design, construction and elements of the built form of neighbourhoods as a means to improve human health and convince people that such questions are a viable means of improving their health will lead to greater individual commitment and responsibility for ecological urban design, as such connecting at least the social to the environmental, if not outright addressing the economic motivations of ecourban development. In the case of urban resilience framing within ecourbanism, planning, designing and building for resilience is argued as a means to maintain quality of life in the face of increased frequency of devastating storm events. The question of pursuing district energy systems within ecourban development, along with other systems and structures of local self-sufficiency, can then be justified as a means of decoupling the viability of the neighbourhood from that of the surrounding city fabric in the event of a major catastrophe. Here, the implicit connection is between the prospective ecological technology of district energy and the self-interest of residents in emerging unscathed from environmental or climate disaster, thus connecting an economic motivation for ecourbanism to an ecological one.

More adequately addressing the social demands and desires of occupants and residents of ecourban neighbourhoods could be a key means of finding the common ground between econ-urban and ecol-urban motivations. LEED-ND, the most prominent neighbourhood-scale sustainability certification system in North America, provides a case in point with its implicit universal principle of an open society, via prohibition of gated communities, as well as credit given to good stewardship of the land as part of being there. At the same time, LEED-ND lacks a great deal of thoughtful reference to or opportunity of credit based upon efforts to improve the human or cultural experience, for example, that of "belonging," which is of course a core concept associated across cultures with the concept of home.

Cross-cutting efforts within LEED-ND to appeal to both econ-urban and ecol-urban models sometimes are called out to be inauthentic, such that practitioners accuse LEED-ND of rewarding projects that do not authentically deserve ecourban certification. Similarly, the Ecodistrict Protocol, under development, aims to blend the value perceived primarily in the urban redevelopment camp with using international certification standards, and the value perceived primarily in the ecol-urban camp with bottom-up neighbourhood indicators and performance efforts, in an effort to make space for both bodies of thinking on best practice in ecourbanism within the development process.

On the more optimistic side, a small number of existing single case studies of ecodistricts such as Civano, Arizona (Nichols & Laros 2010), Orestad (Book et al. 2010) and Stockholm (Metzger & Olsson 2013), nevertheless, suggest the conflict between the econ- and ecol-urban models may not be insurmountable. They admit to finding evidence of ecological modernization, by which efforts to create ecourban districts in the name of environmental and social goals become merged with attempts to use a sustainability edge to attract new growth capital. At the same time, they also recognize simultaneous evidence of deeper institutional change, an ecological restructuring of cities to a political agenda that seeks to move 'beyond growth' along the way (Daly 1997; Fisher & Freudenburg 2001; Holden & Scerri 2014).

In any case, ecourban projects represent a remarkable and growing diversity of practices, underlain by a difference in motivations, understandings, expertise, and relationships that can generally be grouped into an econ-urban or an ecol-urban model. We can thus confirm the trend identified in a more general context by Blok (2012, 2336), that "processes of urban greening are highly fragmented: whereas some areas of the city maintain their sociomaterial commitments to high-carbon economic development, other areas are redesigned in light of low-carbon, green, and sustainable urban visions." Furthermore, this fragmentation, even within a context of proliferating certification systems and standards, is a major part of the high level of debate and critique related to these projects, their "gap between 'rhetoric' and reality', 'words' and 'action'" (Blok, 2012, 2336). Clearer focus on the emerging landscape of ecourban developments will permit learning at this critical time.

## 4. Preliminary Results of the Compendium

As we prepare a new compendium, we refer to a few other resources with a similar intent to serve the group that Blok (2012, 2334) calls the "transnational epistemic community of urban design professionals, who draw on diverse global sources in their sustainability work." The "global census of contemporary eco-city initiatives," that Joss et al. produced over 9 months in 2011, is a resource input for our web resource, but it defines the universe differently than this proposed project does. Importantly, our project takes an explicit focus on urban infill projects (Brownill 2011). Our catalogue will also uniquely and exclusively focus on built projects, excluding policy frameworks with no translation into the built environment, and excluding initiatives yet to be constructed. The Architecture 2030 group, a collection of architects and related professionals committed to meeting the 2030 Challenge of creating a carbon-neutral built environment, has also compiled a web resource, www.2030palette.org. This resource is a platform for understanding the complexities of low-carbon and resilient built environments at scales that range from the region, city/town, district, site, and building scale. In addition to providing general principles that should be considered at each scale, case projects are referenced.

Our research to date has revealed 274 ecodistrict initiatives which fit our selection criteria around the world (122 in the US; 30 in Canada; 63 in the EU; 49 in Asia and the Middle East; 7 in Australia and New Zealand; and 3 in South America). Roughly 10% of these projects are completed, with approximately 90% at various stages of planning or construction. Currently, we estimate that we have located perhaps 70% of the ecodistrict initiatives around the world.

The axes of difference that we expect may emerge in the ecourban developments we will investigate, and which may have an impact on their success in terms of encouraging new social and political behaviours and actions in line with sustainability ideals, include:

1. Social and demographic mix intended and achieved, with a strong bearing on housing and lifestyle affordability and equity considerations
2. Land use considerations, including mix of uses, density and housing and neighbourhood form.
3. Emphasis on self-sufficiency at the neighbourhood scale, including features of energy and food systems, local economic development, water and wastewater systems and sewage
4. Use of ecological systems based approach and considerations given to long-term planning and resilience
5. Governance arrangements, including neighbor and resident “intentional” participation and learning, public-private partnership investment and financing arrangements

**Conclusion: The compendium and what should be done with it?**

In this paper, we have traced some of the core models and emerging trends in ecourban district scale development. As the trend in ecourban development gathers speed in cities around the world, it is important to recognize their history and the range of motivations propelling them, even as we begin to categorize and assess their outcomes in particular contexts. What constitutes ecourbanism at the neighbourhood scale is a fragmented set of motivations, visions, processes, structures, designs and practices. Because they have bases in political, social, and economic as well as environmental, design and technical realms, much of this fragmentation persists even as ecourban developments are pursued based upon particular national and international standards for sustainable design and ecological urban living. More careful cataloguing of initiatives and what lies within them can help to elucidate where the gaps that are often perceived between “‘rhetoric’ and ‘reality’, ‘words’ and ‘action’” (Blok, 2012, 2336), as a first step toward recognizing and then serving a broader range of interests.

**Conflict of Interest**

The authors declare no conflict of interest.

**Notes**

1. Through processes of ecological modernization, whereby policy aims explicitly to ‘decouple’ economic growth from environmental harm, and thus to ‘green’ capitalism, cities are also recognizing the economic wins available to those able to green their urban brand (Fitzgerald 2010; Tang et al. 2010; Baker & Eckerberg 2008; Wheeler 2008; Conroy & Berke 2004).

2. Failure to innovate within the urban revitalization model has also been maligned by economic development officials in terms of stymying more effective revitalization efforts in North American and Europe. Richard Florida (2010, 85) quotes an economic developer as saying: "If economic developers want to do that today, they should move to China. That's where all the big corporate projects are or are heading. Revitalizing older cities in North America and Europe increasingly depends on being able to support lots of smaller activities, groups, and projects."

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