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The Emergence and Spread of Ecurban Neighbourhoods around the World

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Abstract: 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, ecobarrios, One Planet Communities, and solar cities. They have become frames—sometimes the dominant frame—used to orient the construction of new pieces of a city in a growing number of countries. Despite numerous standardization efforts, the field of ecurban neighbourhood planning and practice lacks a consistent cross-cultural understanding of what constitutes meaningful ecurbanism in specific economic, political, ecological, social, and design-based terms. Ecurban neighbourhood projects also respond to strictly local challenges and opportunities and express themselves in fragmented ways in different contexts. This article presents an original typology of ecurbanism as the integration of seven extreme type principles. We developed this typology through an abductive approach, or the back and forth testing of observed practices with arguments advanced in theories of sustainable development, planning and urban studies. While ecurban neighbourhood developments by definition express integrative goals, this typology permits assessment of the extent to which outcomes are being achieved in terms of each specific principle. We define and present a limiting case for each of these extreme type principles. Rather than attempting to render different standards equivalent across national contexts, this typology-based approach to understand the outcomes of ecurban neighbourhood developments promises a means to

facilitate orienting these developments toward higher levels of integration within a common set of principled boundaries, as they are developed around the world.

Keywords: eco-urbanism; eco-districts; green building; sustainable neighbourhood development

1. Introduction

Ecodistricts, écoquartiers, eco-cities, zero, low-carbon and carbon-positive cities, ecourbanismo, ecopolises [1], ecobarrios, ecovillages, One Planet Communities, and solar cities are now on the rise worldwide. Research by Joss *et al.* [2] into the related idea of eco-cities documented the existence of 178 unique policies and initiatives to advance their practice. More than 100 municipal governments in China are proposing to build eco-cities, many of them on greenfield sites on the urban fringe [3]; Charlot-Valdieu and Outrequin [4,5] documented 33 “écoquartiers” in France as of 2009. As of 2015, 79 LEED ND, four BREEAM Communities, three CASBEE Urban Development, and two One-Planet Communities meeting our research criteria have been documented in our compendium, amongst many other neighbourhoods following different local frameworks, demonstrating the rise of neighbourhood and city-scale ecourbanism around the world.

Manuel Ruano claims to have coined the term ecourbanismo or ecourbanism in 1999, defined as “the development of multi-dimensional sustainable human communities within harmonious and balanced built environments” [6]. 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” [7,8]. 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 [9]. The first of such tools appeared in 2004 (e.g., CEEQUAL, China EcoCity) and the latest one (AARP Livability Index) was launched in April 2015.

As a set of planning, design, and technological arrangements for living in particular newly-developed and revitalized neighbourhoods, and as a new ideal for urbane, green, and healthy living, ecourban developments are, at present, demonstrating rapid growth in popularity. 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 [10]. From a social and political perspective, the prospect for change within ecourbanism

comes from an idea about this new form and lifestyle context making space for a sustainability transition in society and governance. These developments have been heralded as demonstrating “the value of partnership, voluntary sector drive, private sector funding and local authority facilitation” [10] (p. 1792), as well as local citizen participation. Just as often, they have been criticized on grounds of cost, social exclusion, and broken promises of environmental performance [10–12]. The expansion of neighbourhood certification and rating systems provides only a partial answer to how best to define eourban neighbourhoods in practice. Certification frameworks for sustainable neighbourhoods, like LEED-ND and BREEAM communities, tend to place predominant value on the environmental and efficiency innovations possible in eourbanism [13]. Urban development models in particular pieces of cities singled out for redevelopment tend to value the capital-generating aspects of development for their own sake. Other values, including the value of integrative planning and development dimensions per se, exist mainly in theory and are, at best, tested only in a few prototypical cases. This makes the identification of ideal type cases of eourban neighbourhood development difficult. We need a better understanding of the kinds and markers of success that eourban neighbourhoods strive for in order to better determine where they are expanding the frontier of urban development, and where they are falling short.

2. Research Questions and Methods

Our ongoing research to date has revealed 420 eourban neighbourhood projects which fit our selection criteria around the world (74 in the US; 27 in Canada; 195 in the EU; 95 in Asia and the Middle East; eight in Australia and New Zealand; and 15 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 80% of these initiatives around the world. In contrast with recent work by Joss and colleagues [14,15], our catalogue uniquely and exclusively focuses on built, infill projects, excluding policy frameworks with no translation to the built environment, and excluding initiatives still in the planning phase yet to be constructed. As we proceed in establishing our compendium of eourban initiatives for review, we recognize the lack of a single encompassing framework and clear set of rules for inclusion or exclusion of certain projects. It is this gap that this article addresses and attempts to fill.

Rapid developments in eourbanism suggest that the time is right for a global review of projects and practices. Such a review serves the interests of researchers, practitioners, and policy regulators, the group that Blok [16] (p. 2334) calls the “transnational epistemic community of urban design professionals, who draw on diverse global sources in their sustainability work.” A useful global review would gauge the nature and degree of progress in eourban development, their diversity and implications. In embarking on such a review, we also recognize the need for a framework to understand diverse and fledgling practices and achievements in constructing eourbanism within the different development contexts of cities around the world.

To meet the need for a better framework for understanding the outcomes of eourban neighbourhood developments around the world, we engaged in an abductive approach to framework definition. As opposed to a theoretically-driven, deductive approach, or an empirically-driven, inductive approach, an abductive process involves iterative steps of distilling principles from theoretical

engagement with literature in urban studies, sustainable development, and planning, alongside empirical research into principles as they are expressed in published documentation of eourban developments. The interrogation of the results of this abductive research by the research team resulted in a new seven-part framework of integrative eourban neighbourhood development, which we consider to be most appropriate to understanding the origins, motivations and practices of eourbanism at this juncture. Each of the seven points in our framework represents a value-based principle for eourban neighbourhood practice, which we find expressed in both theory and practice. Following this, we propose a new seven-part framework of extreme types of eourban neighbourhood development, each underlain by a separate principle which can be found in literature and in practice.

As a set, the seven principles in our typology constitute an integrative framing of eourban neighbourhoods, including their built form, transportation and other engineered systems, land uses, public spaces, local institutions, social make-up, and governance. Each of our extreme types, by nature of being an extreme criterion within a multi-criteria framework, delineates a boundary of practice in one dimension that can help to clarify the limits of classification of cases of eourbanism. This is to say, our extreme types provide us with the ability to identify not ideal cases, but limiting cases, of eourban neighbourhood developments. A limiting case is an instance of neighbourhood development that poses a challenge to certain expressed principles of eourbanism, while exhibiting other outcomes that fulfil the intent of one expressed principle in particular. As such, limiting cases of eourban neighbourhood development serve to reveal the actual limits of pursuing particular principles in the interest of integrated sustainability goals, and help clarify the boundaries of what constitutes eourban development practice across diverse contexts. We were guided by the methodological practice of testing at the margins [17], meaning, searching for those projects and ideas that revealed a limiting case at which the boundaries between what is and what is not eourban development could be clarified. This approach is comparable to Scott Campbell's identification, in 1996, of the three "corners" of a "triangle" of divergent priorities in planning for sustainable development. From each of their respective "corners", economic development planners, environmental planners, and equity planners need to move away from the edges, where conflicts occur between their priorities and perspectives, toward the centre where, ideally, all three priorities would be balanced [18]. By extension, integrative eourban neighbourhood practice is most likely when each of the seven principles receives emphasis within the overall framework, and when work is not driven disproportionately by one principle in particular. Within this space, there remains considerable room to emphasize different principles in different proportion, with respect to local opportunities and contextual constraints.

In this way, the typology of principles outlined in Table 1 is a tool by which to gauge and classify ideas about and practices of eourban development across theories and cases. This framework is placed in the context of contemporary eourban literature, and presented as defining a space of practice, in the next sections.

Table 1. Seven Extreme Types of Ecourban Neighbourhood Developments, with Key Principles.

Extreme Type	Key Principle
Econ-urban	To shift economic growth in cities toward greener products and forms; pursuit of green capitalism.
Ecol-urban	Lighter footprint living with energy and materials efficiency built in to design and technology, as well as the ability to directly experience wild nature.
Living-urban	Complete community development with a view toward wellbeing, liveability, and resilience to shocks from outside the neighbourhood.
Local-urban	Offers a sense of self-determination and active participation in all aspects of local life within the circumscribed neighbourhood.
Democ-urban	Reformulates citizenship at the local scale, and offers deliberative, community-based decision-making, with a suggestion about how this will assist in changing values and behaviours.
Diverse-urban	Accentuates and generates value from the mixing of diverse social, economic, and cultural offerings of urban life.
Equi-urban	Prioritizes redressing inequalities and injustices via attention to targeted groups' needs.

3. Origins of Contemporary Ecourbanism

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 [19]. 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 [20]. 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” [21], 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, marking a stark contrast with the economic proposition of capital growth behind the typical urban redevelopment approach.

Work by Joss and Molella [22] and more recently by de Jong *et al.* [23] sheds light on the rise in eco-city initiatives and the related increase in the number of categories which have entered the policy discourse as a result. While sustainable city initiatives generally aim to improve the environmental, economic and social conditions of the city and those living in it, they are variously framed according to a diverse and growing list of categories, including for example “eco cities”, “liveable cities”, “green cities”, and “smart cities”, among others [23]. This diversity demonstrates the wide array of motivations

and goals for which sustainable cities are being planned and developed, and also the overlapping nature and “co-dependence of environmental, economic and social dimensions” of sustainable development at the city scale [23] (p. 2). Yu [24] notes that the concepts of eco-city, low carbon city and low carbon eco-city are increasingly guiding government responses, both central and local, in China. Guided, in part, by a need to respond to the challenges of urbanization, population growth and industrialization, Chinese cities are adopting “green” urban development policies and embarking on eco-city demonstration projects [24]. Other authors have questioned the sustainability outcomes actually achieved through these large scale eco-city demonstration projects, pointing to the existence of key contradictions, including the location of such projects on land reclaimed from the sea through large-scale dredging, which counter some of the GHG emission savings achieved by the projects once built; a focus on new-build instead of retrofitting the existing city; and a blurry role for residents in the development process and governance of the eco-city [22]. While they point, for example, to concerns by Chinese government officials about “‘false eco-cities’...and ‘fake elements of eco-cities’” [22], they also concede that the Chinese newly-built techno-city presents a new breed of eco-cities, “quite unlike many other contemporary eco-city initiatives elsewhere...planned on a smaller scale within existing cities and with a focus on community-based social and technological innovations” [22] (p. 134). In this and other contexts, Rapoport [25] sees eco-cities as playing a valuable role in advancing urban sustainability, as sites of experimentation and innovation where new ideas are being tested and sustainability ambitions conceived.

Currently, reports from the United Nations Environment Program [26,27], the World Bank [28], 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 [29,30] and are the sites where the potentially-catastrophic impacts of climate change will first play out [31]. It is therefore in urban infill projects that the greatest potential may exist to capitalize on infrastructure and built form efficiencies and also to create new cultural patterns of behaviour that may fit with visions of low-impact urbane and sustainable living [32].

Since the 1980s, eourban redevelopment projects have also been pursued to revitalize and “grow” cities, aiming to capture hidden value by reclaiming and transforming land once considered a liability [33–42]. From 1981 to 1998, London Docklands Development Corporation established the prototype for a form and ethic of urban redevelopment that has reproduced across Europe, North America, and beyond, with comparable results [37,42]. 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 impulse to find new means to profit from underused lands in a post-industrial 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 [43]. 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 [38]. Sometimes redevelopment is motivated by the needs of disadvantaged on-site populations for remediated land, upgraded infrastructure, and modernized housing [32,38,44]. However, 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.

The governance of such redevelopments 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, the 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 [45]. 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” [46] (p. 55). 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” [46] (p. 50).

The Chinese government refers now to “eco-civilization” as a means to resolve the social, economic, and environmental consequences of rapid economic growth of the past three decades. The terms in which the government of China proposes to achieve eco-civilization include cross-cutting reforms toward greater use of market mechanisms, a more open and less regulated economy, 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 [47] (p. 3).

A small number of efforts have already been made to track emergent trends and categories of ecourban developments. Joss *et al.* [2] (pp. 43,56) categorize eco-cities in terms of a descriptive distinction amongst their “main implementation mode,” “technological innovation,” “integrated sustainability plan”, and “civic engagement.” Based on this description, Joss *et al.* [2] 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 outcome. This is similar to the approach taken by Souami [48], who considers 60 European écoquartiers and identifies two distinctive models: 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 and Asian notions of the “post-suburban” [49,50]. Böhm *et al.* [51] refer to long-existing and new emergent ecocultures as ways of living based upon social, ecological, and economic principles radically different from the mainstream. Differences amongst these and other variations on ecocity models relate to the mixing of urban revitalization, ecological modernization, urban development, and other sustainable development goals, which carry divergent results for different groups with claims to the urban environment, including nonhuman nature [12,52].

Jessop [53] 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” [54] (p. 789). Numerous concerns are also raised with regard to the ecological performance of eourban neighbourhood development. 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.” On the more optimistic side, a small number of existing single case studies of ecodistricts such as Civano, Arizona [55], Leeds, UK [56], Orestad, Denmark [57], and Stockholm [58], suggest the conflict between the different extreme types of eourban development and their underlying principles may not be insurmountable. Consensus has yet to emerge on what the ideal eourban model should be, and maybe such consensus can never emerge. Evidence of ecological modernization, by which efforts to create eourban neighbourhoods in the name of environmental and social goals become merged with attempts to use a sustainability edge to attract new growth capital, is clear. At the same time, they also recognize evidence of deeper institutional change, an ecological restructuring of cities to a political agenda that seeks to move “beyond growth” along the way [59–61].

4. Inscribing Eourban Neighbourhood Development in Integrated Space

Recognizing that the primary rift in eourbanism practice worldwide is that between the modernist drive for profit and capital growth, on the one hand, and the humanist need for socially- and ecologically-authentic lifestyles and places to live, on the other, we nonetheless reveal a series of seven “extreme type” principles expressed in relation to eourban developments. In practice, each of these extremes is tempered by reference to multiple principles; and numerous principles are related to one another. Considering each principle in the extreme case in which it would be implemented to the exclusion of other principles, however, permits a clear delineation of the conceptual space within which integrated eourban neighbourhood development is bounded. The result is a comprehensive and multidimensional typology on which to base the recognition and cataloguing of eourban developments, outlined in Table 1 and depicted in Figure 1. We will discuss each extreme type and its limits.

We find the basis for emphasis on the first four of our extreme types: econ-urban, ecol-urban, living-urban, and local-urban, within theories of sustainable development. Beginning from the definition of sustainable development offered in the Brundtland Report [62], “development that meets the needs of the present generation without sacrificing the ability of future generations to meet their own needs,” we have the ambitious proposal to seek development within the shared boundaries of the first three extreme types. First, to meet the needs of the present generation, we understand an econ-urban or capital growth agenda to be the surest path, along with a need to eliminate the negative effects of this push for growth on others [63]. Second, meeting the needs of the present generation without sacrificing the life choices of future generations implies the ecol-urban imperative of achieving development without depleting future energy and resource availability. Third, enabling people increasingly to meet their own needs implies a living-urban or human and community development agenda. Later, with the passing of Local Agenda 21 as part of the Rio Earth Summit in 1992, the local-urban ideal type was introduced, in that

action at the local scale was considered by the assembly to be a necessary precursor to meeting the other three principles of sustainable development. What constitutes local scale action in geographic space has been debated in the intervening decades, with enthusiasm for the specific potential of the neighbourhood scale rising to the fore in the past five years.

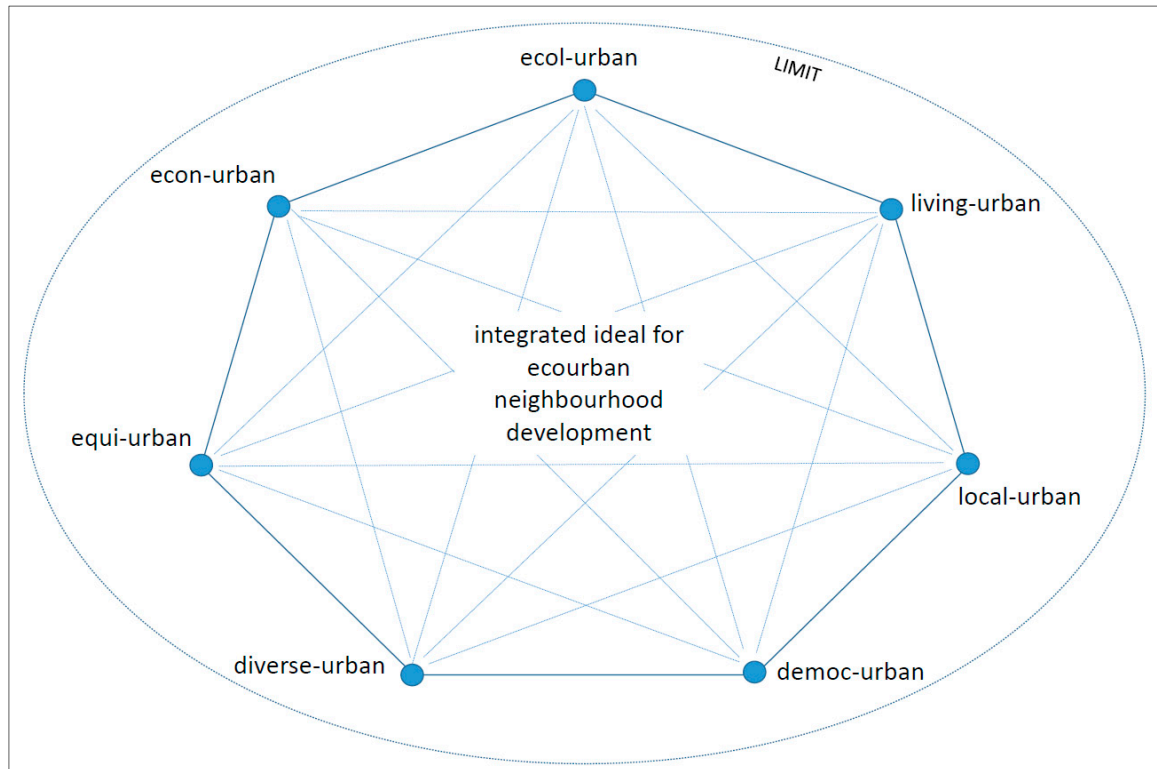


Figure 1. Ecourban neighbourhood development within integrated conceptual space, as circumscribed by seven extreme types.

For a reinforcement of the local-urban extreme type and justification of the final three extreme types, as well as additional justification of the first four already mentioned, we turn to the planning and urban studies literatures. 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 [64], Jacobs [65], Lovelock [66], Hough [67], Soleri [68], and Girardet [69]. Localized planning at the neighbourhood scale has long held appeal and promise of results in keeping with the patterns and habits of local people—plans that get implemented and plans that may therefore improve life conditions. The democ-urban extreme type is popular amongst those who prioritize visioning processes and transition models toward a sustainable future, within social innovation and decentralization approaches and other radical theories. There is a challenge in this principle to the effectiveness of representative democracy, and a commitment to the possibility of direct democracy through full participation of community members. “Green niches”, for example, are grassroots innovations, or experiments in behaviour and social change that begin at a local neighbourhood scale. These efforts are also linked to a local-urban extreme type, as they are sometimes part of Local Agenda 21 efforts and target decentralization of work and life [70]. The concept of co-housing, to take another example of democ-urban ecourbanism, reformulates the notion of home toward less private

space and more shared spaces and group interaction, including group self-governance and decision-making. A deliberative approach to decision making, rule-setting, and conflict resolution is required, and considered to enable behavioural change in an ecurban direction [71].

The diverse-urban principle emphasizes the value of diversity of physical, economic and social conditions in the city, as well as its built form and physical structures. Diversity advocates emphasize the way in which urban diversity has always been key to cities' economic advantage, as it "underlies the appeal of the urban, it fosters creativity, it can encourage tolerance, and it leads city officials to see the value in previously underappreciated lifestyles" [72] (p. 13). Related to capturing the value of diversity, the equi-urban principle emphasizes a just distribution of resources, privileges, and damage across the demographic and socioeconomic spectrum. Advocates, theorists, and planners for just sustainability identify a need for equitable protection of all people from environmental harm and access for all people to environmental benefits [73]. In the context of planning new model ecurban neighbourhoods, concern for affordability of housing and lifestyles for different demographic and socioeconomic groups quickly rises to prominence as an equity concern. Affordable and equitably-provided health services, transportation, safety, education, food, and other institutions and commodities also are prominent factors. In sum, whereas democ-urban principles provide the means to operationalize ecurbanism in local contexts, diverse-urban principles provide the situational components for constructive work together, and equi-urban principles constitute the ethical imperative of ecurbanism [74].

5. Limiting Cases and the Bounds of Integrative Practice

Much more than a holistic ideal for the realization of utopian ecurban neighbourhoods, these seven extreme types represent battle lines between any number of attempts to combine and unite the different types and their underlying principles. Sometimes the battles are between different projects, fighting for identity and designation as a "better" ecurban neighbourhood, one based on a modernist econ-urban extreme and the other based on an ecological preservation urge within the ecol-urban camp. Sometimes the battles are between different actors on the same project. Ecurban plans and results are often presented as "packaged examples that are ready for export" without considering the politics of urban transformation, or whose nature, sustainability, and liveability is served [75] (p. 190). The seven-part typology illustrates the way in which pursuing any particular principle of ecurbanism to the extreme will challenge outcomes overall. Each of the extreme types of ecurban neighbourhood development presents limits to practice. These limits will be sketched out below, briefly because of space constraints, and using specific examples where possible. It is additionally important to keep in mind that these extreme types are pursued with unequal focus and fervor, suggesting a geometry of seeking more integrated solutions in ecurban neighbourhood practice that is more complicated than seeking a centrepiece. 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 [76]. Rarely addressed are the continuing community development demands within neighbourhoods where people live, work and play. Although ecurbanism is a political movement, and represents implicit political and social promises, typically these projects are delivering only ecological and technological results and have potentially exclusionary, inequitable, over-consuming, unsustainable outcomes in social and political domains. This can result in increasing rather than resolving political and social tensions

about urban development and ecological trends in the city [77]. Despite widespread critiques of inscrutable behaviour 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.

The axes of difference that we expect to emerge in the eourban 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, are discussed in turn.

5.1. Econ-Urban

Econ-urban extreme type 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 [78]. In this domain, Susan Fainstein [44] (p. 2) quotes former mayor of London Ken Livingstone as saying: “as soon as you stop building you lose out.” In Fainstein’s analysis, the redevelopment of the Thames Gateway in London based upon extreme econ-urban principles misses the mark of successful redevelopment because of the inability to consider other important urban development goals. This motivation for eourban neighbourhoods stands in stark contrast to that of the global ecovillage movement, which serves as a limiting case for this extreme type, as ecovillage thinking questions the value of growth and even works toward degrowth [79]. Projects which take an econ-urban motivation too far 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, and complaints that these developments proceed with a surfeit of efficiency and a deficit of care for quality or concern for context.

5.2. Ecol-Urban

Ecol-urban extreme type projects prioritize the health and resilience of ecological and energy systems within the neighbourhood above all other considerations, and aim to lighten the footprint of human use of these systems. Often this approach involves increased incorporation and visibility of functioning natural systems and habitats. At their limit, these efforts to innovate technologically for energy and materials efficiency often encounter challenges in terms of suboptimal operation of these systems due to a lack of “savoir faire” or expertise. They are also challenged by mismatch with human use of their neighbourhoods, their “savoir vivre,” a French term which translates roughly at the intersection of liveability, dignity, and decency. In a devastating critique, Vincent Renauld [80] notes the failures of environmental improvements to be incorporated successfully into lower footprint living in three écoquartiers in France, in Grenoble, Bordeaux, and Nantes. He provides examples of residents who fight back in the incorporation of a few of these new technologies and products into their lives, such as vegetated balcony shades, eco-flooring, and resident educational programming. 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 technological, rather than embedded and social, adoption and adjustment.

5.3. *Living-Urban*

Pursuing the living-urban extreme type of eourbanism prioritizes land use considerations for the creation of “complete communities”, including mix of uses, density and housing and neighbourhood form. Often, the aspirations are for place-based lifestyle and identity values, framed as liveability. Challenges arise in the achievement of this extreme type in the variable and subjective ways that different people define the features of place and lifestyle that create liveability for them. Often, the shift implied in lifestyle and daily habits by living-urban neighbourhood design demands significant changes to people’s habits and understandings. While the changes to daily habits presumed by the introduction of the new forms, structures and technologies within eourban 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. Instead, educational and social transformation efforts are needed in order to ensure an adequate take-up on living-urban innovations. In an analysis of different ecological neighbourhood development projects in Australia, Crabtree illustrates how an emphasis on living-urban principles can lead both in the direction of justice and gender equality and away from it, and that achieving eourban design that is also feminist design may entail a radical reconceptualization of home and neighbourhood in their public and private contexts [81].

5.4. *Local-Urban*

Local-urban extreme type eourbanism emphasizes self-sufficiency at the neighbourhood scale, including features of energy and food systems, local economic development, water and wastewater systems and sewage. Bottom-up efforts are prioritized as means to a greater sense of self-determination and meaning among residents and other placemakers. Challenges are presented to this extreme type by forces of standardization and globalization, which emphasize the free global movement of goods, people, and ideas about neighbourhood development too. These challengers accuse an overly localized approach to eourbanism of being at risk of failure due to slow and inertia-prone local publics, regulators and developers. The Ecodistrict Protocol was created as a bridge between the recognized value of a local approach and the necessity of some level of internationalization and standardization for legibility of local efforts farther afield [82]. In this way, the Ecodistrict Protocol presents a sense of limits to the local-urban principle by blending the benefit perceived primarily in the globalization camp with using international certification standards, and the value of bottom-up neighbourhood indicators and performance efforts, in an effort to make space for both bodies of thinking on best practice in eourbanism within the development process.

5.5. *Democ-Urban*

A democ-urban extreme type focuses upon better neighbourhood governance arrangements, including neighbor and resident participation and learning, public-private partnership investment and financing arrangements. This model seeks a place for citizens in the minutiae of urban governance. The limit to this model is that eourban neighbourhood developments, by virtue of their experimental and unusual goals, are often pursued by a special urban development authority, outside of regular local democratic

control. This is viewed as essential to “see results,” avoid NIMBY-style resistance to major change, and to fast track through conservative local government development regulations. At the same time, such a special development authority sets limits on the extent to which democ-urban development can be pursued, as they often leave the local government in the role of critic, rather than 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 less-inhabited southwest, “You can’t just do this kind of dense mixed-use urban waterfront everywhere” [83]. Sociocratic governance principles, used often within the ecovillage movement, take this thinking to the opposite extreme, putting forward seven mutually reinforcing processes, self-organizing circles or committees, and feedback loops, as key to effective participatory decision-making. The sociocracy approach is advocated as a means “to bring out the best in people” and promises equivalence, transparency, and effectiveness when practiced thoroughly and by the entire group [84]. These latter criteria make for high barriers to practice of this democ-urban extreme, however, because of the contrast with dominant practice in bureaucratic and representative decision-making processes.

5.6. Diverse-Urban

Diverse-urban extreme type developments privilege the value of social and demographic mix intended and achieved. These considerations have a strong bearing on housing and lifestyle affordability and equity considerations. LEED-ND, the most prominent neighbourhood-scale sustainability certification system in North America, provides a modest advance upon diverse-urban principles 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. This extreme type hits its limit with alternate aspirations for neighbourhoods that embody a particular historically- and culturally-grounded approach to living. From the other direction, a critique lobbed at some ecourban neighbourhoods is that they in fact do not attract a diversity of people. In the case of Solarseidlung, in Freiburg, Germany, for example, living in the neighbourhood is found to have value to residents for the sense of insularity and “sophisticated isolation” [85] (p. 655) and high level of social control that they perceive. In this sense, by design and by preference, these communities may only attract a relatively narrow range of people [85].

5.7. Equi-Urban

At issue in the pursuit of equi-urban extreme type neighbourhoods is the need to reverse trends toward increasing disparities in cities between engaged and excluded, rich and poor, haves and have-nots. Specifically at issue is the inability of 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, as the examples studied by Freytag and

colleagues above [85] note, the predominance of eourban projects sits 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 [86]. The other side of the limit to this situation is the case to be made for inequitable conditions in an eourban neighbourhood as part of an effort to redress historical injustices. An example of this is “Habitat para la Mujer—the Maria Auxiliadora Community” in Bolivia, a 16.8 ha piece of land where, in an effort to address deep-seated gender inequalities and domestic violence, land titles and community leadership roles are exclusively reserved for women, and low-income families with children and particularly women-headed households are prioritized in a rigorous selection process for new residents [87].

6. Conclusion: The Value of Seeing Axes of Difference in Eourban Neighbourhood Development Practice

In this paper, we have traced some of the core models and emerging trends in eourban neighbourhood-scale development. As the trend in eourban development gathers speed around the world, it is important to recognize their history, the range of motivations propelling them, and their limits in application. What constitutes eourbanism 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 eourban 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 the gaps that are often perceived between “‘rhetoric’ and ‘reality’, ‘words’ and ‘action’” [16] (p. 2336), as a first step toward recognizing and then serving a broader range of interests.

We consider eourbanism to be a phenomenon of both push and pull, from a multiplicity of directions, driven by combinations of these seven extreme types and their underlying principles. On the one hand, it is being driven by a pull for innovation in the realm of urban planning and development, technology, architecture and design; and a push for adequate responses to converging crises in capitalist urban development. On the other hand, 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 as they offer new value to socio-cultural lifestyles. The mix of motivations for pursuing eourban development are both converging and diverging.

We can thus confirm the trend identified in a more general context by Blok [16] (p. 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. The work that we identify here for urbanists and planners is similar to the work laid out by Campbell in 1996 to plan for sustainable development more generally: we should orient ourselves, and orient different projects, within this seven-sided space, within the boundaries that

set limits for work in each extreme type dimension alone. We should strive to balance priorities and integrate divergent agendas.

More adequately addressing the social demands and desires of occupants and residents of ecourban neighbourhoods could be a key means of finding the middle ground and the balance between these seven extreme types and the principles underlying them. Together, ecourban neighbourhoods are changing the solution set we associate with unsustainable development trends at the same time as they change the face of our cities. Clearer focus on the emerging landscape of ecourban developments will permit learning at this critical time. This review contribution represents the early work of an ongoing project investigating Ecourbanism Worldwide, through which we hope to provide deeper and richer opportunities for this kind of learning, from the basis of this typology.

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Author Contributions

Meg Holden conceived and designed the project objectives and established the research direction. Charling Li and Ana Molina conducted the research. Meg Holden, Charling Li and Ana Molina conducted the analysis and wrote the paper.

Conflicts of Interest

The authors declare no conflict of interest.

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