

A Discourse Analysis of Eco–City in the Swedish Urban Context – Construction, Cultural Bias, Selectivity, Framing, and Political Action

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Abstract

In recent years, eco-city as a sustainable urban model has gained increasing prevalence and evolved into a hegemonic urban discourse. As a future vision of urban transformation, eco-city is being increasingly translated into concrete projects, strategies, and policies, mainstreaming urban sustainability and being replicated and proliferated across the world. This study aims to examine, by means of a discursive analytical approach, the construction of eco-city in the Swedish urban context – urban planning and development – with a particular emphasis on definitional and thematic issues, cultural bias, selectivity, framing, and political action. I use six analytical devices to guide the analysis of four documents as an empirical material.

Findings show that the construction of eco-city in the Swedish urban context entails aspects of other sustainable urban models: smart city, sustainable city, green city, and compact city, making eco-city as an umbrella metaphor for such models. Also, only combining all projects, it is clear that eco-city has evolved into a comprehensive vision, embracing most of the requirements and norms set for a city to be ecological. While the concept of eco-city tends to incorporate social and cultural dimensions of urban sustainability, the prime focus remains on economic and environmental aspects – in other words, social considerations are marginal compared to economic and environmental ones. Moreover, the discourse of eco-city draws on and is informed by an array of established discourses. Building on previous discursive constructions of reality, it changes urban reality – aspects of its economic and environmental dimensions, by generating new ways of thinking about urban practices through new amalgamations of established discourses. The technological orientation of eco-city has links to urban-economic-political processes of regulation as well as involves selective framing in terms of discursive interpretation of urban-environmental crises as material processes, recontextualization of urban-economic imaginaries, reference to particular meta-discourses, and privileging of particular discursive chains. Technologically-oriented eco-city can be conceptualized as a specific urban practice which is contingent upon hegemonic discourses on the economic, technological and environmental regulation in relation to urbanization and on the agency of various actors advocating energy efficiency and green technologies and forming alliances on sustainable urban issues. Furthermore, the discourse of eco-city is exclusionary, in that it leaves out some topics and facts relating to the negative direct and indirect environmental effects of the so-called green and energy efficiency technologies. In addition, the discourse of eco-city is shaped by cultural frames associated with environmental and climate awareness and the role of technology in enabling and catalyzing sustainable urban transformation. Finally, using different mechanisms, political action has a great impact on the discourse of eco-city in relation with the environment, climate change, and shifts to low-carbon/low-energy cities. It plays a role in the expansion and success of eco-city.

Key words: Discourse, construction, eco-city, sustainability, green and energy efficiency technology, Sweden, culture

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1. Introduction

1.1. Statement of Topic

Ranging from districts to cities, the contemporary built environment has been seen as a source of numerous adverse environmental impacts, including unsustainable use of resources and associated greenhouse gases (GHG) emissions, environmental degradation, inappropriate urban design (community disruption), inefficient transport systems, unchecked haphazard urbanization, and so on. But of all these energy consumption and GHG emissions remain the most pressing environmental issues when it comes to urban areas, as cities are the engines of economic growth. In the built environment, the urban form directly affects ecosystems, air and water quality, soil pollution and contamination, climate, and GHG concentrations accumulation (Jabareen 2006; Cervero 1998). Human (economic) activities are increasingly triggering climate change or making it worse (IPCC 2007). Climate change has overarching multi-effects (the environment, the economy, and human health – see, e.g., Parry 2007; Stern 2007; McMichael, Woodruff & Hales 2006) on society. Therefore, the growing concern about the exponential economic growth, the density of urban pollution, and the environmental crises has intensified the challenge to rethink existing urban models for the planning/design and development of cities and thus devise new frameworks for making urban living more sustainable. Urgent changes are required in the design of the built form (Jabareen 2006). As a response, sustainable urban development has emerged as a strategy to address environmental (as well as economic and social) challenges and problems associated with the exiting built environment; it is increasing gaining significance across the globe. As Bibri (2013, p. 1–2) puts it: ‘It [sustainable urban development] is a task that all the world’s major cities are facing nowadays, and, in the coming years, there will be even more enormous pressure on urban planning due to...the wave of urbanization, a dynamic clustering of population, buildings, and resources, which is occurring on a staggering scale. At present, across the globe, planners are taking on the challenge of developing cities in such a way as to enable them to provide human environment with minimized demand on energy resources – a smaller ecological footprint – and minimized adverse effects on the environment’. Rather, sustainable urban development is attracting not only urban planners, but also many scholars, policymakers, and government officials (Rapoport & Vernay 2011). It has motivated ‘scholars and practitioners in different disciplines to seek forms for human settlements that will meet the requirements of sustainability and enable built environments to function in a more constructive way than at present’ (Jabareen 2006, p. 38).

In recent years, eco-city, an ambitious sustainable urban model for addressing environmental urban concerns, has gained increasing prevalence and evolved into an environmental urban discourse. It is considered as a vision of urban change, which is being increasingly translated into concrete projects, strategies, and policies as well as proliferating across the globe. Since the early 2000s, a number of ambitious plans have begun to emerge for brand new sustainable urban districts and cities, high-profile examples include Hammarby Sjöstad, in Stockholm; Western Harbor in Malmo; Masdar City, in Abu Dhabi; and several eco-city projects in China. A global, comprehensive survey of eco-cities carried out in 2010 by Joss (2010) lists 79 eco-cities. Eco-cities are becoming ubiquitous through the internationalization of eco-city policy and practice (Joss, Cowley & Tomozeiu 2013). Eco-cities are mainstreaming urban sustainability due to several external driving factors (Joss 2011). In Sweden, further initiatives within the field of ecological districts and cities are increasingly on the rise. As an example, an eco-city project to be executed in Oresund region is expected to be completed by 2020, where energy supply will consist of 100% renewable or recovered energy (Sweden.se

2013). Stockholm will witness a new project named the Stockholm Royal Seaport, which will be completed by 2025.

1.2. Problematizing – Gap Spotting and Truth Assumptions

We refer to eco-city as a discourse in this context both because it is an urban phenomenon for which there is no widely accepted and clear definition as well as people talk about it and hence when engaging in debates about this urban issue form a discourse. In terms of the construction of the discourse of eco-city, there are so many formulations and understandings, which are essentially contingent on the economic, social, cultural, and political context where eco-cities as both visions and projects are constructed and implemented, respectively. Indeed, there is no clear consensus – in urban planning and development – as to how human settlements embody sustainability, and different perspectives and several sets of principles exist on and for sustainable cities with respect to environmental, social, and economic considerations and dimensions of sustainability (see, e.g., Haughton & Hunter 2003; Haughton 1997; Basiabo 1996). The multiplicity in the construction of eco-city as a vision or discourse goes back to the early years that heralded the emergence of the concept, and has also been affected by the contested concept of both sustainable development and sustainable urban development alike. Indeed, the operationalization and implementation of the latter conceptualizations at the local level are highly contested and variable (Heberle 2006). Further, the term 'eco-city' came to widespread a few years after having been defined by Richard Register who was credited as the first to have coined the term in 1987: as 'an urban environmental system in which input (of resources) and output (of waste) are minimized' (Register 2002). Back then the term had different connotations or implications, manifested in the multiplicity of urban projects. Roseland (1997) concurred that there was no universally accepted definition of the eco-city, but rather the concept entailed more an ensemble of ideas and terminologies, such as urban planning, urban layout, resource conservation, economic development, transportation, and so forth. Joss (2010), who carried out a comprehensive survey of eco-cities in 2010, acknowledges that the conceptual multiplicity of eco-city initiatives render it difficult to have a clear definitional implication. Therefore, it has been of difficulty to construct a clear, complete vision of what an eco-city actually epitomizes. Although the emergence of some plans (on district and city scale) during 2000s led to lessening the difficulty surrounding this urban vision, the operational definition of the term continues to date to be still vague (Rapoport & Vernay 2011). In practice, many local governments, planners, and landscape architects tend to grapple much with such diverse aspects as sustainable, ecological, and pedestrian-oriented urban form, as shown in many examples from practice (Jabareen 2006).

Furthermore, like all discourses, the discourse around eco-city is assumed to draw on or be informed by earlier discourses. Hence, it has not emerged out of nowhere, but rather it is influenced by the evolving cultural, social, political, and economic structures, factors, and actors, which have shaped the discourses informing the main discourse. In other words, the ongoing discussions over the potential of eco-cities in catalyzing sustainable urban development and thus advancing ecological sustainability has evolved into hegemonic discourse that is constructed in the light of understandings and formations about different societal changes that happened in recent periods of history. As a consequence, eco-cities embodying specific environmental, economic, and social imaginaries are increasingly getting translated into concrete urban projects and strategies and institutionalized in the form of local politics and regulatory frameworks. This relates to Cultural Political Economy (CPE), a way to examine social transformation (Jessop & Sum 2001; Fairclough et al., 2004; Jessop 2004;

Sum 2004, 2006), e.g. sustainable urban transformation (e.g., Moulaert et al., 2007; Ribera-Fumaz, 2005). From this CPE perspective, the review of how eco-cities are overall formulated and done in an interplay between ‘discursive selectivity (discursive chains, identities and performance) and material selectivity (the privileging of certain sites of discourse and strategies of strategic actors and their mode of calculation about their ‘objective interests’, and the recursive selection of these strategies)’ (Sum 2006, p. 8, cited in Dannestam 2008) in a dialectical manner is of import to comprehend why eco-city as a new urban vision or discourse is translated into concrete projects, and why the socio-political and policy orientation is legitimized with regard to such visions.

Therefore, ecological sustainability and green/renewable technologies may well be used as rhetorical and persuasive moves in the eco-city discourse to achieve economic and political ends. Especially, technology being part of society is shaped by cultural frames. Put differently, technology and society constitute a mutual shaping process where the two influence each other simultaneously. ‘...technologies are, like other socio-cultural artefacts, social constructions whereby seamless webs of economic, technical, social, cultural, and political factors and actors shape and influence the creation and development of technologies. This relates to the view of social embeddedness of technology, which assumes that technological innovations are loaded with symbolic and ideological meanings’ (Bibri 2013, p. 4). Rather, in the case of technological innovations, society inclines to become what technologie dictates and does. In relation to the use of green technology, drawing on a CPE perspective, to understand why eco-city discourse is translated into concrete projects and strategies or why an institutional and policy and orientation is legitimated with references to it requires investigating how eco-city is constructed in a dialectical interplay between discursive and material selectivity (see Sum 2006). Hence, the technological orientation of eco-city ought not to be conceived as an ‘isolated island’ or treated as something ahistorical, neutral, and apolitical. Indeed, drawing on Foucault 1972, the discourse of eco-city is in constant interaction with political action – which is one of the fundamental elements of its creation as a new object of knowledge and hence its translation into concrete urban endeavors and projects. This relationship is important to understand why eco-city appears and why it is successful. As a final postulation, like all discourses, eco-city discourse excludes some topics and facts in order to produce meaning. In particular several studies (e.g., Huesemann & Huesemann 2011; Bibri 2013) have revealed the negative environmental impacts of green and energy efficiency technologies which are at the core of eco-city projects in Sweden and many other European countries. Consequently, certain aspects of eco-city are underscored and brought to the fore, while other aspects are ignored and underestimated as part of a framing operation.

1.3. Aim of the Study

From the preceding background, this study intends to examine, by means of a discursive analytical approach, the construction of eco-city in the Swedish urban context – urban planning and development – with a particular emphasis on definitional and thematic issues, cultural bias, selectivity, framing, and political action. Hence, this attempt of discursive examination looks into the examined documents from the perspective of ideologies and institutions.

1.4. Research Questions

With reference to the above objective and background, the following questions can be formulated:

1. How is eco-city defined and constructed in the broader social context of Sweden?
2. What discourses does eco-city discourse relate to and how does this interdiscursivity change urban reality?
3. Why is it that eco-city becomes technology-oriented?
4. What are the main cultural frames and shifts that shape eco-city discourse?
5. Which topics are excluded when talking about technologies in eco-city discourse?
6. How does political practice influence eco-city discourse?

1.5. Structure of the Study

The rest of the research report will proceed as follows. Section 2 outlines and discusses the research methodology: how the data was collected, selected, and analyzed. Section 3 presents a conceptual and theoretical framework. In section 4, a review of literature and research on eco-city is conducted in which a number of central concepts and ideas are discussed and elaborated on and relevant studies are analyzed, synthesized and evaluated. Section 5 contains the analysis results of the empirical material. Section 5 provides concluding remarks, presenting a summary of the findings and reflecting over the results and discussing them in the light of theoretical perspectives.

2. Research Methodology

2.1. Discourse Analysis Approach

In this study, discourse analysis is used as a tool to collect and analyze a set of documents addressing eco-city projects in Sweden. The rationale for espousing this approach is that the present examination is concerned with the construction of knowledge and how it is given meaning and applied to social world – the urban, cultural, economic, and political reality. Discourse analysis approach is employed to examine the way in which issues (e.g. environmental urban crises) and understandings (e.g. ecological sustainability) are socially constructed by actors (e.g. urban planners), as well as how these affects urban planning as a form of social practice. In this account, it builds on the idea of language as constitutive of the social (urban). In this sense, discourse analysis as analytical method can be described as a way to understand how particular ways of talking can have social implications in a particular social context – specific to this study, how the discourse of eco-city shape urban practices in Sweden. Fairclough and Wodak (1997) describe discourse analysis as the study of the link between the discourse and the surrounding social practice. According to Hajer (1995) and Dryzek (2005), discourse analysis is used, in environmental sociology, to explore the manner by which social actors construct and reconstruct environmental issues. Hence, the value of discourse analysis lies in understanding how planning decisions and actions are made and taken, respectively (Portugali & Alfasi 2008; Kumar & Pallathucheril 2004). Of relevance is also the CPE perspective, which in relation to urban context examines urban ‘imaginaries, their translation into hegemonic economic strategies and projects and their institutionalization in specific structures and practices’; specifically, these imaginaries ‘discursively constitute...[urban] objects and their associated subjects with different ideal and material

interests and they can be studied in terms of their role alongside material mechanisms in reproducing and/or transforming...[urban] and political domination' (Sum 2006, p. 2).

In the context of this study, discourse analysis can unveil the patterns underlying the social construction of urban problems in relation to ecological dimension of sustainability, particularly. It can also, in the study of eco-city, reveal the basis of its claims that it can make a city or district more environmentally sustainable (see Rapoport & Vernay 2011). It moreover exposes how discourse circumscribes/closes and opens up what people can think and imagine doing. As Bibri (2013, p. 24) states, 'particular discursive constructions and the position contained with them open up and close down opportunities for actions, by constructing particular ways of seeing the world and positioning an array of subjects within them in particular ways'. Therefore, a common theme in discourse analysis is an emphasis on discourses as enabling or restricting. Thus, it is the processes and mechanisms through which discourses are constructed or operate, respectively as to giving the impression that they represent true image of reality that needs to be analyzed (Phillips & Jørgensen 2002).

2.2. Analytical Devices – Six Steps

Given the focus and the scope of this study, I shall apply a specific analytical framework to orientate reading of text in the selected documents. Based on the research questions, I have identified a set of aspects that are of significance in the formulation of the overall meaning in these documents and that ought to be analyzed from a discursive perspective. Consequently, I set out six analysis phases (described separately below), combining analytical tools from (Bardici 2012), Fairclough (1995), Bibri (2013), and (Dannestam 2008, building mainly on Sum (2006) and Jessop (2004)). Discourse analysis entails a diversity of analytical techniques which provide different textual insights and are usually determined by the objective of, and the approach to, the study. Different analytical perspectives suggest different things, and there is no consensus as to how to analyze discourses (Phillips & Jørgensen 2002, p.1).

2.2.1. Discursive Constructions – Definitional and Thematic Issues

This analysis phase looks at discursive objects (with ecological values and ideals and material interests) and how they are represented as well as definitional issues in eco-city vision. It touches upon the question of which themes, connotations, and social relations the documents construct. Clearly identifying key objects is an important step to understand how eco-city as an urban vision is associated with multiple perspectives, among others. Also, Fairclough (1995) suggest that texts contribute to both building the image of different actors and describing their relations.

2.2.2. Interdiscursivity

This stage looks at some aspects of interdiscursivity: how eco-city discourse relates to other discourses. Discourse analysis involves 'intertextuality' (Fairclough 2005). This is an aspect of discursive practice. It 'is partly through discursive practices in everyday life (processes of text production and consumption) that social and cultural reproduction and change take place' (Phillips & Jørgensen 2002, p. 61) Texts are informed by various discourses which are regulated by the primary discourse and thus bring new reality into existence. 'It is by

combining elements from different discourses that concrete language use can change the individual discourses and thereby, also, the social and cultural world' (Ibid, p. 7).

2.2.3. Discursive–Material Dimensions: Macro–processes and Selectivity

In this stage, I attempt to examine some discursive and material dimensions of eco–city in terms of their link to sustainable urban macro–processes of regulation, as well as how eco–city as an urban vision plays out with regard to discursive–material selectivity on different scales. This relates to the CPE approach which looks at urban imaginaries (e.g. eco–city), 'their translation into...hegemonic projects and strategies and their institutionalization in specific structures and practices' (Sum 2006, p. 2), adding to crises as path–shaping moments (Jessop 2004).

2.2.4. Cultural Frames

This stage dissects some framing aspects in the discourse of eco–city as well as relevant cultural frames associated with this discourse. Cultural frames are equated to social representations – they both represent shared forms of representing the urban world in the context of this study. Fisher (1997) defines such frames as 'socio–culturally and cognitively generated patterns which help people to understand their world by shaping other forms of deep structural discourse'. They are cultural–specific and represent a force which shapes the way urban planners think and what they should think, to draw on Moscovici (1984).

2.2.5. Framing – Inclusion and Exclusion

This stage involves framing as an operation of inclusion and exclusion of topics and facts. Framing has been defined in multiple ways. It denotes 'organizing discourse according to a certain perspective, which is usually articulated in the author's attempting to choose a particular angle of the complex reality... It is inherent to the construction of texts. In the production of texts, framing involves composition – the arrangement of facts, opinions, and value judgments in order to produce a certain meaning – and selection – an exercise of inclusion and exclusion of these elements... Various "framing devices"... "suggest how to think about the issue", and different "reasoning devices"... "justify what should be done about it"' (Bardici 2012, p. 37). 'To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described' (Entman 1993, p. 55).

2.2.6. Political Action

The final stage of analysis examines the interaction between eco–city discourse and political practice. According to Foucault (1991, cited Ortega–Cerdà 2004, p. 4), 'political practice does not transform the meaning or form of discourses, but the affects the conditions of its emergence, insertion and functioning'. As a corollary of its interaction with the eco–city discourse, politics forces its emergence, evolution, and functioning. Here I will explore only some of the key facets of the aspects of the processes that link political action with the creation and development of eco–city – that is, the main mechanisms used by political action.

2.3. Selection of Cases and Documents for Analysis

In this study eco-city is used as an umbrella term. Hence, considered are also eco-district projects in Sweden. I intend to focus on ambitious plans for existing and brand new sustainable districts and cities in Sweden, hence my choice of high-profile examples of such plans that emerged between 2001 and 2011, a period which has heralded the emergence of a clear, comprehensive vision of what an eco-city entails in Sweden and around the globe. The rationale behind this is, to quote Rapoport and Vernay (2011, p. 13), ‘that as the demand for practical ideas about how to make urban living more sustainable increases, these projects are likely to get increasing attention from policy makers and practitioners... Further research should focus on providing the information that these people will need to make informed decisions about how to achieve the eco-city objective in their own context’. Therefore, I selected eco-city projects on the basis of size, ambition, and document availability. I focused on urban projects in Sweden that were and are being developed with strong ecological sustainability or sustainability objectives with consideration of geographical locations – southern and northern of Sweden. Then I attempted to pinpoint the projects for which there was adequate information and thus documents available in the public realm to carry out a discursive examination. Ultimately, I settled for four eco-district or -city projects: Western Harbor, Hammarby Sjöstad, Stockholm Royal Seaport, and Green Sustainable Øresund Region. Table 3.1 lists each of the selected projects along with related documents for analysis – empirical material. When espousing discourse analysis, it is common to delimit the units of analysis. The sources used include project websites and academic publications about sustainable cities in Sweden.

Doc. Type	Title	Project	Status	Authors
Journal article	The Development of a Sustainable Urban District in Hammarby Sjöstad, Stockholm, Sweden?	Hammarby Sjöstad	Completed	Pandis Iverot S. and Brandt N.
Project Website	Stockholm Royal Seaport: Vision 2030	Stockholm Royal Seaport	Unbuilt	City of Stockholm
Project Website	Western Harbor, The Bo01-area, <i>A city for people and the environment</i>	Western Harbor	Completed	City of Malmö
Journal article	Green Sustainable Øresund Region: Eco-branding Copenhagen and Malmö	Green Sustainable Øresund Region	Under Construction	City of Malmö and Copenhagen

Table 2.1: Documents selected for analysis

3. Conceptual and Theoretical Frameworks: Discourse and Theoretical Models

Discourse has been defined in multiple ways, depending on its context of use, but there is agreement on many of its aspects. In this study, I shall use a specific discourse theory, following the work of Michel Foucault (Foucault 1972). Indeed, ‘in relation to the term “discourse” Michel Foucault is often mentioned. His theoretical work and empirical research on discourse is of significant contribution to the field of social and cultural inquiry.’ (Bardici

2012, p. 26) Most of existing definitions, as I will exemplify in this section, borrow from Foucault's perspective on discourse. Foucault defines discourses as 'practices which focus on the object of which they speak' (Foucault 1972, p. 49), e.g. sustainable urban practices focusing on eco-city projects and strategies which the discourse of eco-city talks about. Specifically, as '[A] group of statements which provide a language for talking about – a way of representing the knowledge about – a particular topic at a particular historical moment... But since all social practices entail meaning, and meanings shape and influence what we do – our conduct – all practices have a discursive aspect' (Foucault 1972, cited Hall 1997, p. 44). In relation to environmental discourse, Hajer (1995, p. 44) defines discourse as 'a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is giving to physical and social realities'. Borrowing also from Foucault, discourse is described as 'a group of claims, ideas and terminologies that are historically and socially specific and that create truth effects' (Alvesson & Due Billing 1999, p. 49); 'a set of meanings metaphors, representations, images, stories, statements and so on that in some way together produce a particular version of events' (Burr 1995, p. 48); or 'the general idea that language is structured according to different patterns that people's utterances follow when they take part in different domains of social life' (Phillips & Jørgensen 2002, p. 1). In relation to ideology, 'discourse concerning a group of ideological statements can be described as patterns of representation developed socially to generate and circulate a set of norms or values which serve the interests of particular groups in society...or legitimize and reproduce power (Bardici 2012, p. 26). The above definitions can all be considered, to varying degrees, relevant working definitions for this study. Foucault's definition is about ways of seeing, thinking, acting, and being – discourse and practice dialectics. In this account, the discourse of eco-city shapes social (urban) practices as legitimate forms of actions, and such practices, in turn, reproduce and transform the discourse. Discourses as objects of knowledge representing social reality are brought into existence by both language and practice in a specific culture, to draw on Barker (2000). Social constructionist worldview posits that particular social understandings of the reality lead to different social actions, and thus social construction of knowledge or truth has social implications (Burr 1995; Gergen 1985). Put differently, discourse and social practice interact in a dialectical way. Accordingly, certain urban practices become legitimate forms of actions from within eco-city discourse, and they in turn reconstruct, transform and challenge this discourse that legitimates these actions in the first place. The discourse of eco-city 'is reshaping the actions of urban planners and policy makers as actors, as well as the meanings these actors ascribe to their undertakings' (Bibri 2013, p. 24). Therefore, 'discourses set the frames for meaning and practice. It is the construction of discourse as a process where social reality is constructed through a symbolic system. The constitution of the social world occurs through the processes of text production and consumption – discursive practice.' (Bardici 2012, p. 26-27)

Furthermore, common to discourses is that they have some kind of effect and thus power implications associated with knowledge or truth. In relation to this, Foucault asserts that truth effects are produced within discourses (Phillips & Jørgensen 2002). Hence, truth is a product of a discursive construction and, accordingly, the discourse of eco-city determines what can be true and false. For example, there exist various perspectives of eco-city discourses today (e.g., Rapoport & Vernay 2011); 'each carries with it a supporting body of knowledge, and thus 'truth' according to the way things are seen by those who claim a version of truth' (Bibri 2013), but which one of these gain dominance depends on the socio-cultural context where urban practices associated with eco-city are implemented. Social constructionist worldview postulates that we are fundamentally socio-cultural beings and our understanding and

representation of the world is the result of socio–culturally situated interchanges among actors (Burr 1995; Gergen 1985). In this context, the discourse of eco–city has been around for almost two decades and circulates freely in Swedish society. It is now established as urban and institutionalized practices relate to it in a structured way.

Furthermore, in its relation to subjects, truth is asserted by Foucault (1972) to be produced by institutional apparatuses and their techniques such as institutions, rules and things. ‘Truth...is produced only by virtue of multiple forms of constraint... Each society has its regime of truth, its ‘general politics’ of truth; that is, the types of discourse which it accepts and makes function as true, the mechanisms and instances which enable one to distinguish true and false statements, ...the status of those who are charged with saying what counts as true’ (Foucault (1972, cited in Hall 1997, p. 49). Consequently, on Foucault’s argument that subjects are created within discourses, ‘people are not really free to think and act, because they - and their ideas and activities - are produced by the structures (social, political, cultural) in which they live’...The individual self becomes a medium for the culture and its language... Subjects may produce particular texts, but they are operating within the limits of...the regime of truth of a particular...culture. This subject of discourse ‘cannot be outside discourse, because it must be subjected to discourse. It must submit to its rules and conventions, to its dispositions of power/knowledge. The subject can become the bearer of the kind of knowledge which discourse produces. It can become the object through which power is relayed. But it cannot stand outside power/knowledge as its source and author.’ (Bardici 2012, p. 29)

4. Literature Review

4.1. Conceptual Background Definition

The key constructs that comprise this study include eco–city, sustainability, sustainable (urban) development, and renewable energy sources. These concepts are interrelated as I will illustrate in this section.

4.1.1. Eco–city Definition

As an umbrella metaphor, the eco–city ‘encompasses a wide range of urban–ecological proposals that aim to achieve urban sustainability. These approaches propose a wide range of environmental, social, and institutional policies that are directed to managing urban spaces to achieve sustainability. This type promotes the ecological agenda and emphasizes environmental management through a set of institutional and policy tools.’ (Jabareen 2006, p. 47) Different environmental, social, economic, institutional, and land use policies can be used to manage eco–cities to achieve sustainability (Ibid). Moreover, eco–city should not only be confined to the scale of districts and neighborhoods, but also the scale of city. According to Joss (2011, cited in Rapoport & Vernay 2011, p. 1), ‘an eco–city must be a development of substantial scale, occurring across multiple sectors, which is supported by policy processes’.

4.1.2. Sustainability Definition

The term ‘sustainability’ has taken on multiple definitions in the literature. Common to all definitions, however, is that sustainability is cast ‘in terms of the environment, the economy, and equity, which in a sustainable society should be enhanced over the long run’ (Bibri 2013, p. 8). In other words, sustainability refers to the integration of natural environmental systems

with social and economic systems and celebrating ‘continuity, uniqueness and place making’ (Early 1993). Urban sustainability represents a long-term goal of a balanced social, economic, and ecological system from an urban context. Hence, it enables us to see how far away we are from achieving its ultimate goal and to strategize and calculate how we will attain it. In this context, to ‘become a powerful and useful organizing principle for planning’, it should be ‘incorporated into a broader understanding of political conflicts... The more it stirs up conflict and sharpens the debate, the more effective the idea of sustainability will be in the long run’ (Compbell 1996).

In the context of this study, the emphasis is on the environmental or ecological dimension of sustainability. Environmental sustainability entails living within the carrying capacity of the planet, and one way to do this is to create processes and systems that enable resources to be used in a way that can be replenished naturally. The basic premise ‘of environmental concern is that modern humans should find ways of consciously *living with the grain of nature*’ (Foster 2001, p. 156) This implies that instead of reshaping ‘the planet to fit our infinite needs, we should ‘reshape ourselves to fit a finite planet’ (Orr 2004).

4.1.3. Sustainable (Urban) Development Definition

Sustainable development is seen as vision for achieving the long-term objectives of sustainability. The concept is highly contested, so too is its implementation and operationalization at local level (Hopwoodil, Mellor & O’Brien 2005; Jöst 2002; Jacobs 1999 Heberle 2006), but it retains enormous potential (Compbell 1996). Sustainable development has been applied to urban planning and development practices since early 1990s (e.g., Wheeler & Beatley 2010). Sustainable urban development is described as ‘...a process of change in the built environment which foster economic development while conserving resources and promoting the health of the individual, the community, and the ecosystem’ (Rechardson 1989, p.14). However, ‘one is no...likely to abolish the economic–environmental conflict completely by achieving sustainable bliss... Nevertheless, one can diffuse the conflict, and find ways to avert its more destructive fall–out’ (Compbell 1996). In relation to eco–city, sustainable development denotes ‘renewable resources should be used wherever possible and that non–renewable resources should be husbanded... This intergenerational aspect...suggests a confluence of diverse social, environment, and economic objectives and raises a number of important questions’ (Hall, Daneke & Lenox 2010, p. 440).

4.1.4. Renewable Energy Definition

Renewable energy technologies are increasingly being used in many eco–cities across the world, especially in Sweden. Renewable energy commonly refers to energy that derives from natural resources and processes – continually replenished, such as solar, wind, waves, and geothermal heat. It involves ‘electricity and heat generated from solar, wind, ocean, hydropower, biomass, geothermal resources, and biofuels and hydrogen derived from renewable resources’ (IEA 2002, p. 9). Renewable energy is related to environmental sustainability and thus ecological sustainable development.

4.2. Environmental Discourses and Eco-cities

A large body of the literature on eco-cities tends to be analytical, attempting to experiment with and investigating various propositions about what makes a city ecologically sustainable. This entails the planning, design, and implementation of sustainable urban models depending on different urban contexts, patterns, and scales. Research work on eco-city tends to either describe the phenomenon (e.g. Roseland 1997; Joss 2010; Joss, Cowley & Tomozeiu 2013) or concentrate on normative recommendations or prescriptions on realizing the status of eco-city (Joss, Tomozeiu & Cowley 2012; Girardet 2008; Kenworthy 2006). Drawing on this prescriptive literature, Rapoport and Vernay (2011, p. 2) conceive of eco-city 'as a way of practically applying existing knowledge about what makes a city sustainable to the planning and design of new and existing cities'. However, realizing an eco-city requires making numerous decisions about and taking actions as to sustainable technologies, urban models/designs, and governance. In fact, one of the main challenges facing eco-cities is urban governance (Joss, Tomozeiu & Cowley 2012). Of much debate has been the link between planning and urban design projects and sustainability goals (Williams 2009; Bulkeley & Betsill 2005), especially in relation to the integration of environmental, social and economic goals and values. Further to the point, the manner in which decisions are made and actions are taken occurs through a social process involving intricate negotiations, and often disputes, as contended by many contemporary scholars of urban planning processes (Healey 2007; Flyvbjerg 1998).

Eco-city as a discourse has claims that it can make a city more sustainable – environmentally-friendly. The question is whether these claims concern their design and the way they are governed and their citizens participate in decision making. This is what urban planners or designers try to look at when dealing with eco-cities. It is worth pointing out that these claims differ from a country to another – in other words, there are divergences around a particular set of how to respond to these urban visions. The focus of this study is on eco-districts or –cities in Sweden. I look at what exactly means to be an eco-city in the Swedish context as well as how it is constructed in relation to other discourses circulating in Swedish culture, some specificities in the interplay between discursive and material selectivity (selective framing) and political action involvement. However, the above claims can be traced through looking at a number of categories of discourse about urban development and sustainability, which include, according to Rapoport and Vernay (2011, p. 3–4):

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

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

Category 2: Which actors drive the eco-city?

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

Category 3: Eco-city as a model...?

Given that the eco-city is a relatively new and ambitious model of urban development, one could anticipate that the actors involved would see it as more than just a place to live. On the one hand the eco-city could be about presenting a new model of sustainable urban living to the world, something to be replicated in other locations...

Category 4: Behaviour change as solution or technology and design as solution? How can an eco-city help achieve sustainability? In considering existing sustainable urban projects, there appear to be three ways for it to do this. First, inhabitants can be encouraged to change their behaviour in order to live more sustainably. The other possibilities are connected to technological solutions, which can be used in two different ways. Production focused solutions incorporate technologies to generate renewable energy into an eco-city. Consumption focused solutions use technology and design to decrease the demand for resources, for instance through passive ventilation.

Category 5: Sustainability by design or management and governance?

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

Several sets of criteria have been proposed to identify what an ‘eco-city’ is, entailing economic, social, and environmental objectives and qualities. According to Roseland (1997) and Harvey (2011), the ideal ‘eco-city’ is a city that fulfills the following set of requirements: operates on a self-contained, local economy, maximizes efficiency of energy resources; is based on renewable energy production and carbon-neutrality; has a well-designed urban city layout and efficient transportation system, prioritizing walking, cycling, and public transportation; creates a zero-waste system; support urban and local farming; ensures affordable housing for diverse socio-economic and ethnic classes; raises awareness of environmental and sustainability issues and decreases material consumption; and, added by Graedel (2011) is scalable and evolvable in design in response to population growth and need changing.

5. Discourse Analysis of the Empirical Material

5.1. Discursive Constructions – Definitional and Thematic Issues

The emphasis here is on the discursive aspects of eco-city – that is, on the discursive themes, chains, social relations, including some aspects of social practices attached to eco-city projects. The way eco-city is defined and constructed has much to do with the Swedish culture as a broader context in the sense that it attempts to amalgamate diverse aspects of other sustainable urban models, such as smart city, sustainable city, and compact city. Transitioning from Western harbor, through Hammarby Sjöstad, to Stockholm Royal Seaport projects, it is clear that the vision of eco-city evolves in such a way to attempt to embrace most of the requirements and norms set for a city to be ecological. It is also important to underscore that while the concept of eco-city tends to incorporate social and cultural dimensions of urban sustainability, it still focuses more on economic and environmental

aspects. In other words, social considerations are marginal compared to economic and environmental consideration – with the economic concerns being the most dominating of all dimensions of sustainability. Moreover, eco-city as a relatively ambitious model of urban development is seen as a new model of sustainable urban living, an ultimate form of healthy living in modern urban spaces or cities. The social actors involved in eco-city projects perceive it as more than just a place to live, incorporating economic, social and cultural aspects into the design of eco-city. Below is a selection of quotations that illustrate the above socio-discursively constituted constructions:

Eco-district or city forms ‘an exciting and sustainable urban environment’ that is attractive to live and work in as an urban area; is ‘environmentally sound’ and based on ‘100% locally renewable energy’ (e.g. solar energy, wind power and hydropower); entails greening (biodiversity, varied flora and fauna) and energy efficiency in the built environment and local production of energy from waste and sewage (Malmo City 2001). Hammarby Sjöstad model ‘handles energy, waste, sewage, and water..., aiming to reduce the metabolic flows in accordance with the ideas of sustainable urban districts by Girardet 1992 and Newman 1999’ (City of Stockholm, p. 11, cited in Pandis & Brandt 2010). ‘The city district is to be planned and built in accordance with the principles of the natural cycles’ (p. 4); and ‘Hammarby Sjöstad is to serve as a spearhead for the movement towards ecological and environmentally friendly construction work and housing, and be at the forefront of international striving for sustainable development in densely populated urban areas’ (p. 7). Moreover, eco-city involves smart/ICT-based mobility – e.g. ‘digital displays for real-time information on bus arrivals at the stops’ and diverse and mixed land uses, sustainable transport: ‘environmentally friendly modes of transport’, intensification of activities, and efficient land planning (Ibid). ‘Stockholm Royal Seaport will be developed into a vibrant and sustainable world-class urban district, attracting the world’s most highly skilled people and most successful companies’ (Stockholm City, p. 14) – these are features of smart city: smart people and smart economy. It ‘will offer an urban environment characterized by a wide diversity of architecture and lifestyles. The design...stimulates good social relationships. The blend of residential and business accommodation, nature experiences and cultural attractions means everyone can feel at home.’ (Ibid, p. 7) ‘The urban environment should offer natural meeting-points and a well-balanced mix of housing, activities, education, service, and green areas’ (Malmo City, 2001, p. 7). See Appendix A for more quotations illustrating diversity, density, and mixed land use as design concepts of eco-city.

Speaking of design, eco-city in Sweden tends to see sustainability mostly by design. Actors involved in eco-districts or cities in Malmo, Stockholm, and Øresund Region see sustainability as resulting from endeavors undertaken during the design phase – i.e. these districts or cities are ecological because they are designed as such. Hammarby Sjöstad ‘should impose as little demand as possible upon resources, and be an environmentally well-adapted city district...in densely populated urban areas’ (City of Stockholm 1996a, p. 4, cited in Pandis & Brandt 2010). ‘The natural cycles should be closed at as local a level as possible’; ‘energy should be derived from renewable sources, and...obtained from local sources’; ‘transport needs are to be reduced’; and ‘The...technology generated in the process are to be disseminated...’ (Ibid) In Western Harbor, buildings are well-insulated with low-energy windows to decrease heating needs. This approach ‘reduces heating and cooling loads, resulting in energy consumption through the operation of the building... [D]evices for solar shading are added to reduce the heat gains in summer.’ (Sev, p. 165–166) Avoidance of heat gain and loss through insulation and additional devices is one of the approaches into achieving the main goal of energy conservation (Ibid).

In contrast to Western Harbor Stockholm Royal Seaport, Hammarby Sjöstad focuses also on sustainable construction as an important feature of eco-city. The guiding vision of Hammarby Sjöstad is that ‘the environmental performance of the city district should be twice as good as the state of the art technology available in the present day construction field...’ and it ‘is to serve as a spearhead for the movement towards ecological and environmentally friendly construction...’ (Pandis & Brandt 2010, p. 10)

Furthermore, eco-cities projects are associated with high complexity due to their scale and extension, as well as the multiplicity of the involved stakeholders or actors. In other words, they involve long planning horizons, complex interfaces, and multi-stakeholder-based decision making and planning and development processes with conflicting interests. This leads to inefficiencies (e.g. delivery delays, benefit shortfalls), bottlenecks and communication failures, changes in ambition over time, deviation from initial planning, uncertainties, and so on. Below are some illustrative quotes:

‘...the project organization was resourceful in gathering actors from different branches and in integrating external and internal contributions to the project’ (Pandis & Brandt 2010, p. 13).

‘Achieving this result [Seaport will be developed into a vibrant and sustainable world-class urban district] will only be possible by working together. The work requires consensus, collaboration and dialogue. Together we can give Stockholm a world-class urban district and a new, modern entry point from the Baltic’ (Stockholm City 2010, p. 4).

‘Important steps have been taken– but to allow further progress, a number of institutions need to work together. Cooperation between the City of Stockholm and the business community is essential’ (Ibid, p. 22).

5.2. Interdiscursivity

Eco-city as an urban discourse or vision has emerged and evolved from a number of previously established discourses; that is, it has been influenced by earlier discursive constructions of reality advanced by these discourses. The main discourses that inform eco-city in Sweden include: sustainable development, academia, science and technology, health, policy, economics, local politics, information society, green romanticism, globalization, and ecological modernization. Below is a selection of quotations that highlight interdiscursivity – relation between the main discourse of eco-city and other discourses.

‘Research has shown that close contact with green areas, sun and water make people healthier, both physically and mentally’ (Malmö City, 2001, p. 3).

‘The energy concept is in line with the EU Commission goals to increase the share of renewable energy in Europe substantially’ (Ibid, p.6).

‘The City of Malmö has received support from the government for a local investment program for the environmental measures taken in’ the eco-district of Western Harbor’ (Ibid, p. 7).

Funds ‘from the local investment program was earmarked for the Bo01 project, with the explicit requirement that a scientific evaluation be made’ (Ibid).

There is ongoing research ‘within all areas of priority: ...energy, green structure..., building and living..., environmental information and education and sustainable development’ (Ibid).

Hammarby Sjöstad should ‘be an environmentally well–adapted city district, whilst being at the forefront of international strivings towards sustainable development in densely populated urban areas’ (Pandis & Brandt 2010, p. 2).

‘This is why the business community and the City of Stockholm have come together around a vision that provides a shared basis for the creation of Stockholm Royal Seaport – a world–class urban district’ (Stockholm City 2010, p. 4).

‘Stockholm Royal Seaport has particularly good prospects of becoming an international prototype for sustainable and high–quality urban environments’ (Stockholm City 2010, p. 5).

‘The Climate Positive Development Program...will create a new global target for sustainable urban development. Stockholm Royal Seaport is one of 18 projects worldwide that the program is supporting to serve as good examples of economically and environmentally successful urban development’ (Ibid, p. 9).

‘The objective is for Stockholm Royal Seaport to take the lead in realizing the latest innovations within climate, environmental technology and sustainable development’ (Ibid, p. 15).

‘Globalization creates new opportunities and challenges for the Stockholm region. The City of Stockholm is taking a number of measures to meet the international competition for tomorrow’s investments, business ventures and visits. One example is a new urban district: Stockholm Royal Seaport’ (Stockholm City 2010, p. 22).

‘Environmental efforts came to be considered important not only for the sake of health, quality of life, and sustainability, but also for stimulating growth and enhancing attractiveness of the region’ (Anderberg & Clark 2009, p. 1).

‘But in a broader view it appears that the geopolitical economy of global economic restructuring and environmental load displacement through ecologically unequal exchange also play important roles in the region’s recent environmental history’ (Ibid, p. 17).

‘Ecological modernization optimistically emphasizes potentials for combining environmental and economic goals by identifying and exploiting win–win situations’ (Ibid, p. 4).

Like all discourses, eco–city discourse involves different interrelating understandings, views, and issues from different discourses. Combined, they transform or change urban reality: the ecological character of urban settlement comes to the fore and other social, cultural, political, and economic practices are undertaken with ecological consideration and environmental awareness. Thereby a new reality materializes with its social and physical aspects. Essentially, within the eco–city discourse one can clearly discern between a variety of social, environmental, technological, and scientific discourses, a combination of which in Swedish temporal and spatial context has led to a broader urban transformation. In this account, public discourse as an inherent inter–discourse constitutes the kind of discursive elements that are

accessible by citizens and the public at large as to the debates on the benefits of living in eco-cities as sustainable urban spaces in Sweden.

5.3. Discursive–Material Dimensions: Macro–processes and Selectivity

From a CPE perspective – considering that urban scholars have joined the CPE cluster (e.g., Dannestam 2008), it is of import not to conceive of eco-city supported by local politics as an ‘isolated island’. Rather, it is crucial to recognize the interplay between eco-cities and macro-scales, as well as the links to urban–economic–political processes on a macro level, as I will illustrate below by a set of quotations extracted from the examined documents. Macro-processes of urban–economic–political regulation shape the discursive–material dialectics of sustainable urban change. Specifically, there is a role for environmental policy in influencing the development of eco-city and low-carbon technologies and their integration in urban planning. Eco-city is being translated to concrete projects and planning strategies through regulatory and policy frameworks related to urban development, green technology, climate change, and the environment. See section 5.6 for a related analysis.

In the Swedish urban context, eco-city projects are typically based on having planners define what aspects of the world become ecological, which means that they assign particular significance to urban reality. They tend to depart from comprehensive definitions of eco-city, but operationalize less sophisticated concepts of it, meaning that they tend to favor the selection of green and energy efficiency technologies, such as solar photovoltaic, wind turbines, hydropower, building automation systems, and so on. The basic idea is that they don’t operate in isolation, but rather they are influenced by the wider social and economic contexts within which they operate. Below are some quotes that indicate the technological orientation of eco-city:

Hammarby Model ‘is a model primarily based on well-tried technologies with supplementary technical innovations (such as fuel cells, solar cells, solar panels, biogas stoves, and green roofs), attempting to reduce the metabolic flows of the district in accordance with the principals of biological ecosystems.’ (Pandis & Brandt 2010, p. 17)

‘As the Hammarby Sjöstad vision: ‘the environmental performance of the city district should be twice as good as the state of the art technology available in the present day construction field’ (Ibid, p. 12).

‘...the influence of the overarching aims and operational goals of the choice of technical solutions in Hammarby Sjöstad is manifested in the installation of solar cells..., the use of FX-ventilation systems..., and the installation of the automated vacuum waste collection system’ (Ibid, p. 12).

‘The emergence of a completely new district affords particularly good opportunities for climate – adapted and future – oriented development. From pioneering energy-efficient technical solutions in buildings and infrastructure to the development of smart electricity networks that enable local production and distribution of electricity, a new urban district offers the most fertile ground for new ways of thinking’ (Stockholm City 2010, p. 16).

‘In order to stimulate development, Stockholm must offer excellent opportunities to develop and apply innovative technology. Stockholm Royal Seaport Innovation will show how

solution within environmental technology are being tested and applied in the new urban district, serving as an important showcase to the outside world' (Stockholm City 2010, p. 14).

The above shows selective framing as to discursive and material dimensions of eco-city in terms of the interpretation of material processes, use of certain meta-discourses, and favoring specific discursive chains. From a CPE approach, a key question is that why it is that eco-city becomes technological. In this account, the emphasis would be on those material trends impacting the urban environment, such as deindustrialization, the intensity of economic growth in cities, the rapid growth of urban population, and the environmental crisis. In view of discursive aspects in the analysis, the environmental crisis associated with cities as an engine of economic growth as material processes get construed discursively. It is to note that crisis is, according to Jessop (2004, p. 167, cited in Dannestam 2008), 'crisis is never a purely objective process or moment that automatically produces a particular response or outcome. ...In short, crises are potentially path-shaping moments. Such path-shaping is mediated semiotically [or discursively] as well as materially. Crises encourage semiotic as well as strategic innovation'. In relation to Hammarby Sjöstad, Western Harbor, Stockholm Royal Seaport, and Green Sustainable Øresund Region, the technological orientation of the eco-city has been made possible with the discursive use of the environmental-urban crisis. The discursive interpretation of such a crisis happens and certain (technological) strategies are opted for, constructed according to that interpretation. Hence, technological eco-city ought not to be taken to mean something apolitical, neutral or unrelated to economics. Technological eco-city should rather be conceptualized as 'hegemonic discourse' (see Sum 2004) formulated in consideration of specific notions of changes to the wider socio-technological landscape in Sweden in the recent period of history. Drawing on Jessop (1998, p. 91), the eco-city or -district, in general, 'has been constructed through the intersection of diverse economic, political and socio-cultural narratives which seek to give meaning to current problems by construing them in terms of past failures and future possibilities'.

As a discourse, eco-city relates to specific urban visions, such as the 'discourse on green city' and the discourse on 'low-carbon city', which are recontextualized in Swedish urban settings. Also, policy-makers make reference to macro-discourses such as 'sustainable urban development' and globalization when legitimizing eco-city politics, and diverse actors formulate discursive chains that select and privilege particular objects of green city and urban governance. This highlights how the discourse around eco-cities in Sweden becoming technological is selected and maintained in different urban settings with the use of material mechanisms entailing strategies of strategic actors and institutions and their mode of calculation as to their interest, to draw on Sum (2006) and Dannestam (2008).

5.4. Cultural Frames

As shared forms of understanding the urban world – especially environmental and economic aspects of it, cultural frames are socio-culturally generated patterns which shape the structural discourse of eco-city. In other words, the eco-district or -city has been constructed through the intersection of socio-cultural narratives associated with technological innovation and their transformation effects for urban change as well as ecological thinking, which seek to give meaning to current environmental urban problems by construing them in terms of past unsustainable urban forms as failures and the development, diffusion and implementation of green and energy efficiency technologies and greening as future possibilities. Technology-related cultural frames have thus been reconstructed and challenged in eco-city discourse, assuming that they have long existed within and through urban or urban planning discourses.

In this account, it is important not to think of eco-city as if it operates in isolation; rather, it is the product of socio-cultural processes and urban macro-processes of policy and part of wider economic and political contexts in terms of how its underlying concept and practice favoring the selection and use of technology have evolved into the current vision of eco-city. Eco-city has thus materialized through particular cultural frames, conventionalized by Swedish society and attuned to its values and material interests, particularly with respect to green and energy efficiency technologies and their perceived positive force in achieving sustainable urban transformations – i.e. eco-city – in addition to climate and environmental awareness. The following are excerpts of texts exemplifying relevant cultural frames:

‘In order to stimulate development, Stockholm must offer excellent opportunities to develop and apply innovative technology. Stockholm Royal Seaport Innovation will show how solutions within environmental technology are being tested and applied in the new urban district, serving as an important showcase to the outside world’ (Stockholm City 2010, p. 14).

Today, our city is already a world leader in developing, marketing and applying new energy and environmental technology, a position that must be managed and reinforced. Innovative environmental technology and creative solutions will make Stockholm Royal Seaport a showcase for sustainable urban planning’ (Ibid, p. 5).

‘Stockholm is one of the world’s cleanest capitals... Prudent investments, well-reasoned decisions and constructive dialogue will enable us to reconcile a rapidly growing city with a high level of environmental ambition and responsible, long-term resource management.’ (Ibid, p.8).

‘Environmental efforts came to be considered important not only for the sake of health, quality of life, and sustainability, but also for stimulating growth and enhancing attractiveness of the region’ (Anderberg & Clark 2009, p. 1).

‘The Øresund region was already one of the cleanest densely populated regions in the world and had for decades combined remarkable environmental improvements with economic growth’ (Ibid, p. 17).

‘Research has shown that close contact with green areas, sun and water make people healthier, both physically and mentally. Beauty...has a proved positive effect on health. These research results were all taken into account by the planners’ (Malmö City 2001, p. 3).

‘...sustainable development and ecological planning are deep-seated’ in Sweden’ (Anderberg & Clark 2009, p. 7)

Therefore, the cultural frames associated with the role of new and green technologies and environmental awareness in urban-economic development have shaped the structural discourse of eco-city. This is evident in the vision of eco-city articulated in the documents. It is moreover worth noting that cultural frames are being reshaped by the emerging cultural shifts associated with the increased awareness of the risk posed by climate change, and the integration of environmental considerations and concerns into planning and budgetary mechanisms, and into changes in urban norms and behavioral patterns. Below are some quotes showing some cultural changes.

‘...climate change requires continued investments and greater awareness of the challenges that lie ahead’ (Ibid, p.8).

The city of Stockholm ensures that ‘an integrated administrative system that guarantees that environmental aspects are taken into consideration in budgets, operational planning, reporting and monitoring, reduced carbon dioxide emission by 25 percent per inhabitant since 1990 set the target of being fossil fuel-free by 2050’ (Stockholm City 2010, p. 9).

‘In...Sweden..., environmental policies were radicalized during the 1990s...The Ecocycle vision was a national vision for sustainable Swedish society’ (Anderberg & Clark 2009).

‘This breakthrough in environmental policy based on ecological modernization was paralleled in the 1990s by advances in urban ecology, eco-city movements and sustainable city visions’ (Ibid, p. 6).

5.5. Framing – Inclusion and Exclusion

The framing of eco-city as an urban reality emphasizes the economic benefits of promoting eco-districts and -cities through the development and implementation of green and energy efficiency technologies in eco-city projects being promoted in Sweden. Below is a selection of quotations that illustrate some facts and value judgment associated with the inclusion process of framing:

‘Stockholm City Council decided...that Stockholm Royal Seaport’s environmental profile should: support the marketing of Swedish environmental technology and contribute to the development of new technology...’ (Stockholm City 2010, p. 9).

‘Programs of environmental innovation, local sustainability investment, development of alternative energy sources, and green industry initiatives are seen not only to improve environmental performance, but also to stimulate regional economic competitiveness...’ (Anderberg & Clark 2009, p. 4)

‘Sustainable technology and enhanced efficiency of resource utilization are seen to increase competitiveness and provide market advantages’ (Ibid).

‘Ecological modernization optimistically emphasizes potentials for combining environmental and economic goals by identifying and exploiting win-win situations (Ibid, p. 3).

The above framing operation entails selecting economic aspects of the perceived urban reality and making them salient to encourage causal interpretation, ecological evaluation and treatment recommendation for low-carbon technologies given their contribution in stimulating economic competitiveness. By turning what is mainly economic to ecological this framing process excludes important aspects in the textual arrangement to produce meaning. That is to say, some issues relevant to environmental sustainability are ruled out in the construction of eco-city as an urban reality. The positive implications of the technological orientation of eco-city are only one angle from which this rather more complicated reality could be approached. In fact, green and energy efficiency technologies have negative direct and indirect effects on the environment, but the discourse of eco-city tends to eschew the questioning of such technologies, favoring to construct them as realist ecological or sustainable urban achievements. In the urban context, low-carbon technologies are associated

with direct and indirect effects. The former involve the adverse environmental implications that arise from the development, production, distribution, and disposal of environmental, clean, green, and energy efficiency technologies by the industry – that is, they consume huge amount of energy and thus generate significant GHG emissions associated with their manufacture, transportation, and the operation of technological–industrial facilities. Such direct negative environmental impacts have indeed been of much debate in recent years (e.g., Huesemann & Huesemann 2011; Bibri 2013). Critics have taken up issues relating to unsustainable use of materials and energy (resource depletion) through exploiting natural resources and degrading the environment, hazardous substances, and toxic waste disposal. This is on rise as such technologies are proliferating due to their increasing commercialization and implementation in eco–city projects justified by their role in stimulating economic competitiveness – urban markets and industries.

As far as indirect effects are concerned, they are associated with the implementation and use of the so–called environmental, clean, green, and energy efficiency technologies in residential, commercial and public buildings as well as power plants and grids. In this account, the negative environmental effects of such technologies derive from the GHG output emitted due to the intensive energy needed to power and operate solar panels, wind turbines, hydropower systems, and so on. What may further complicate the matter is that technological and industrial systems may purposefully embed design flaws to serve economic ends, which make them inefficient systems and prone to continuous improvement, although they are designed to preserve the environment and reduce the adverse effects of anthropogenic involvement. In all, the indirect environmental impacts of low–carbon technologies are especially intricate to measure at the macro scale and from a long–term perspective. And the whole idea of focusing on economic considerations when promoting eco–cities relate to the discourse or concept of neo–liberal urban spaces, which has been a subject of criticism as this discourse tends to undervalue the risks associated with putting a significant emphasis on economic goals and values as the lone and key driving factor for sustainable urban development.

The main arguments against the focus on technology in designing and developing eco–cities through including and excluding elements relate to biases in strategic interests and the focus on new and green technology when talking about eco–city as an urban reality. Biases in strategic urban interests may lead to overlooking alternative avenues of promising urban development such as greening and green infrastructures and other energy conservation strategies – e.g. ‘passive heating and cooling through orientation’ and ‘low–energy urban development improves the quality of life in a city, including ecological, cultural, political, institutional, social and economic components’ (Sev 2009, p. 11). The technological focus of eco–city may lead to an underestimation of the negative implications of the development and use of the so–called environmental, green, clean and energy efficiency technologies and related infrastructures socially constructed as to be necessary for existing and new cities to be ecological or green. As mentioned by Anderberg & Clark (2009, p. 6), ‘the only possible way out of the ecological crisis is by going further into industrialization’; there are ‘nuances in the subtle complexities involved in institutional responses of industrial capitalist societies to ecological crises’.

5.6. Political Action

In Sweden, environmental, green, clean and energy efficiency technologies, the core component of eco–city, have a strong governmental support as well as proven successful

urban practices. Both these technologies and ecological–urban projects appear in policy documents and political statements. They are therefore influenced by political practices in relation with the environment, climate change, shifts to low–carbon/energy cities, and ecological modernization. The understanding of this link is then of import to understand the appearance, development, and promotion of eco–districts and –cities. In this account, shifts to eco–cities are unlikely to proceed and function without parallel political actions. There is thus interplay between eco–city discourse and politics as a societal factor.

One of the mechanisms pursued by political action to support, implement, and make function the discourse of eco–city is the construction of environmental and eco–technology policy and the development of regulatory instruments. Indeed, there are views that question the practicality of green technologies and the promises of energy efficiency technologies, hence the need for policy push to bring about changes to urban markets and industries and encourage sustainable urban models that emphasize the use of such technologies. Furthermore, government intervention in eco–city projects and endeavors is another mechanism by which political action promotes and mainstreams eco–districts and –cities in Sweden. This comes in the form of investing in green and energy efficiency technologies, promoting technological eco–innovation, supporting the establishment of sustainable urban forms and settlements, encouraging the adoption of low–carbon technologies, and so on. Below are some excerpts of texts that exemplify the impact of political action on eco–city and what this entails in terms of low–carbon technologies.

‘...The political support for the vision [Hammarby Sjöstad]...highlights the importance of the political consensus created by the vision’ (Pandis & Brandt 2010, p. 12).

‘...the program [Hammarby Sjöstad] and the coordinated project organization had broad political support, backing the development of existing and new technologies’ (Ibid, p. 18).

‘The City of Malmö has received support from the government for a local investment program for the environmental measures taken in the eco–district of Western Harbor’ (Malmö City 2001, p. 7).

Funds ‘from the local investment program was earmarked for the Bo01 project, with the explicit requirement that a scientific evaluation be made’ (Ibid).

‘Environmental programs have to a lesser degree been characterized by traditional command and control measures via legislation and regulation... [E]nvironmental policy also implies new roles and challenges for local authorities... Municipalities are responsible for...initiating local collaboration in various ways. Such collaboration is often encouraged and supported by central government...’ (Anderberg & Clark 2009, p. 5).

Adding to the above is the impact of political action on diffusing, accumulating, and preserving knowledge and teaching technology–based sustainable urban forms (e.g. eco–city) and related design concepts. This is done inside of universities, across Sweden, and in specific research areas, such as sustainable urban management, at Malmö University, sustainable urban planning, at Blekinge Institute of Technology, sustainable urban design and planning, at Royal Institute of Technology, sustainable urban design at Lund University, and so on. These research and educational programs directly affect the ongoing as well as the upcoming projects of eco–district and –city in relation to the regions where these universities and center institutions are located.

6. Conclusion, Reflection, and Discussion

The primary intent of this study was to conduct a discourse analysis of the construction of eco-city in the Swedish urban context – definitional and thematic issues, cultural bias, selectivity, framing, and political action. Based on the textual analysis my findings indicate that the construction of eco-city in the Swedish urban context entails aspects of other sustainable urban models, namely smart city, sustainable city, green city, and compact city, making eco-city as an umbrella metaphor for such models. Also, only combining all projects, it is clear that the vision of eco-city has evolved into a comprehensive one, embracing most of the requirements and norms set for a city to be ecological. This is based on earlier research work on eco-city both describing the phenomenon of eco-city (e.g. Roseland 1997; Joss 2010) and focusing on normative prescriptions on achieving the status of eco-city (Harvey 2011; Girardet 2008; Kenworthy 2006). The finding is also consistent with earlier research on eco-city (Rapoport & Vernay 2011) pointing out that eco-cities claims can be traced through looking at such categories of discourse about sustainable urban development as sustainability in its three dimensions, eco-city as a model, technology and design as solution, and sustainability by design and governance. Further, it is important to underscore that while the concept of eco-city tends to incorporate social and cultural dimensions of urban sustainability, the prime focus remains on economic and environmental aspects. In other words, social considerations are marginal compared to economic and environmental consideration – with the economic concerns being the most dominating of all dimensions of sustainability. The evaluations made (Larson et al 2003) argue that, although Western Harbor Bo01 could be regarded as successful in terms of ecology and technology, the aspects of social and economic sustainability tended to be weaker (Karrholm 2011). Moreover, eco-city as a relatively ambitious model of urban development is seen as a new model of sustainable urban living, an ultimate form of healthy living in modern urban spaces or cities. It is worth noting that Hammarby Sjöstad model involves some aspects not included in the other three projects. This supports the conclusion that the conceptualization of eco-city in Sweden differs from other conceptualizations of eco-city elsewhere – considering the discursive study carried out by Rapoport and Vernay (2011). In this account, the construction of the discourse of eco-city in the Swedish urban context encompasses an interesting theme: ‘the movement towards ecological and environmentally friendly construction’ (Pandis & Brandt 2010). This is in line with the theoretical argument on the contribution of the construction industry to sustainable urban development. This relates to the conceptual framework developed by Sev (2009), which relies on three basic principles: life-cycle design, resource management, and design for environment.

The discourse of eco-city emphasizes the complexity of eco-city projects, particularly in terms of the multiplicity of the involved stakeholders. They involve long planning horizons, complex interfaces, and multi-stakeholder-based decision making and planning and development processes with conflicting interests. This coincides with theoretical argument regarding the multi-stakeholder based decision making and planning and development processes with conflicting interests characterizing sustainable urban projects. Stakeholders have a wide variety of social, cultural, educational, and professional backgrounds, as well as separate roles, functions, responsibilities and interests within the implementation of the urban project, and define sustainable urban projects through different lens (Ding 2008).

Eco-city as an urban discourse draws on and is informed by a set of established discourses in the sense of the latter containing discursive constructions of reality that have shaped those associated with eco-city discourse. This finding is in line with Fairclough’s (2005) notion of

intertextuality and Foucault's (1972) conception of interdiscursivity. Moreover, the discourse entails new ways of thinking about urban practices through new amalgamations of established discourses. This relates to the theoretical model on the altering function of intertextuality in new discourses (e.g., Phillips & Jørgensen 2002). However, other energy conservation methods (e.g. passive solar design, low-energy urban development) tend to be overlooked in sustainable urban change as constructed in eco-city discourse. This design concept denotes the reduction of the demand for energy and the sustainable use of passive energy through design practices and measures (Jabareen 2006). By using siting, orientation, and layout, solar gain can be used in an optimal way to minimize the need for buildings' space heating or cooling by conventional energy sources (Owens 1992). Sev (2009) points out that it plays a key role in providing quality of light and controlling artificial light to achieve energy efficiency. The designer when designing a building 'must look at the greater environmental impact and contextual implications of the building in relation to the site, and must search for alternatives to orient the building according to the sun path for passive solar gain and daylighting... Windows facing east allow for early warming of spaces during winter, while south-facing windows will aid afternoon warming. West-facing windows need to be carefully designed so they do not add to overheating the spaces. Vegetation can also be an effective solution for passive heating and cooling' (Ibid, 165). As regards to low-energy urban development, it 'improves the quality of life in a city, including ecological, cultural, political, institutional, social and economic components... Integrating land-use, transport and environmental planning is important to minimize the need for travel and to promote efficient and effective modes of transport, including walking... Urban form and location of activities together with economic incentives and well organized public transport have a significant impact on traffic flows. The settlement formation of a city, which determines orientation and clustering of buildings, also affects the microclimatic conditions' (Ibid, p. 11).

The technological orientation of eco-city has links to urban-economic-political processes of regulation as well as involves selective framing in terms of discursive interpretation of material processes (urban and environmental crises), reconstruction of urban-economic imaginaries, employment of particular meta-discourses, and privileging of particular discursive chains. This finding relates to CPE as an approach into examining urban visions, 'their translation into hegemonic...[urban] strategies and projects and their institutionalization in specific structures and practices' (Dannestam 2008, p. 359). Technologically-oriented eco-city can be conceptualized as a specific urban practice which is contingent upon hegemonic discourses on the economic, technological and environmental regulation associated with urbanization and on the agency of various actors promoting green and energy efficiency technologies and forming alliances on sustainable urban issues. Hence, eco-city is not a model, but rather the product of social interactions and processes, which entail a seamless web of various actors and factors.

Like all discourses, the discourse of eco-city is exclusionary, in that it leaves out some topics and facts relating to the direct and indirect effects of the so-called green and energy efficiency technologies for the environment. Technologizing eco-city should not be the sole driver of sustainable urban change. In this sense, eco-city as a sustainable urban model is an oxymoron, as the development and use of new and green technologies degrades and pollutes the environment. This is supported by earlier research pointing out that energy efficiency technologies involves the exploitation, degradation, and harm of the environment (e.g., Bibri 2013) and that green technology is rejected as an attempt to ongoing reform due to exploitative patterns of the environment; it only looks environmentally-friendly on the surface (Huesemann & Huesemann 2011). Technological solutions remain quick fixes to

rather complex, multidimensional environmental problems. Urban sustainability is about a holistic system necessary to solve economic and environmental conflicts. Campbell 1996, p. 1) points out that ‘in the coming years planners face tough decisions about where they stand on protecting the green city, promoting the economically growing city... Conflicts among these goals are... [not]... merely conceptual, among the abstract notions of ecological, economic, and political logic... Rather, these conflicts go to the historic core of planning, and are a leitmotif in the contemporary battles in...our cities... And though sustainable development aspires to offer an alluring, holistic way of evading these conflicts, they cannot be shaken off so easily’. The socially constructed view of nature put forward here challenges the view of these conflicts as a classic battle of “man versus nature” or its current variation, “jobs versus the environment” (Ibid) – green and energy efficiency markets and industries.

The discourse of eco-city is shaped by cultural frames associated with environmental and climate awareness and the role of technology in enabling and catalyzing sustainable urban transformation. These frames are also reshaped by the emerging cultural shifts associated with the increased awareness of the environmental risks posed by climate change, and the integration of environmental considerations, ideas, and concerns into planning and budgetary mechanisms, and into changes in urban norms and patterns. This finding is consistent with Fisher’s (1997) conception of cultural frames, as well as the theoretic discursive perspective that discourses and social and economic structures reflect and reshape each other. However, cultural frames are said to be prescriptive in the sense that they impose themselves upon historical actors (forming and relating to discourses) in a force which shapes the way people think and dictate what they should think – e.g. understanding and solving complex environmental problems (e.g., Moscovici 1984; Foucault 1972).

Using different mechanisms, political action has a great impact on the discourse of eco-city in relation with the environment, climate change, shifts to low-carbon/energy cities, and ecological modernization. This plays a role in expansion and success of eco-city. This finding is supported by Foucault’s (1991) assertion that there is a constant interaction between discourses and politics. This has implications for the development of eco-city within particular directions and the extent to which these directions will contribute to ecological sustainability. Or, eco-city might become a new vehicle for Swedish government to re-package its neo-liberal urban-economic interests in the guise of the new language of sustainable urban transformation and thus the discourse of eco-city.

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Appendix A: Discursive Constructions – Diversity, Density, and Mixed Land–Use

‘The district will offer a large and varied range of amenities including restaurants, cafés, bars, shops, gyms, cinemas, conference facilities and hotels. Cultural venues for music, art, dance and other types of public event will also be established’ (Stockholm City 2010, p. 7).

‘Stockholm Royal Seaport offers good conditions for business community to continue to grow. It also offers unique opportunities to build a new vibrant and sustainable urban district with new jobs and homes in one of Stockholm’s prime locations, with proximity to business and shopping centres, vast nature and areas of open water’ (Stockholm City, p. 4).

‘The centre will be an international meeting place where the city, the business community and research institutions work together to profile and demonstrate Swedish know-how in sustainability and city planning. The centre will furthermore serve as a platform for presenting the area to the public and interested parties’ (Stockholm City 2010, p. 14).

‘The dynamic of the city will be reflected in the diversity of living accommodation and the range of amenities, culture and entertainment. Housing, amenities and public spaces will be distinguished by accessibility and modernity’ (Stockholm City 2010, p. 18).