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SCIENCE FICTION AND THE SMART-ECO CITY[1]

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Abstract: This paper takes as its starting point the science fictional aesthetic evident in the promotion of many 'eco-city' initiatives, and particularly in their more recent hi-tech and 'smart' incarnations. This may seem unsurprising, since the genre of science fiction is well aligned with the project of envisioning alternative urban futures, and has a well-established dynamic relationship with technological innovation. It also, however, points to an underlying utopianism: eco-city and smart-city visions and plans are often criticised for paying insufficient attention to the social and political dimensions of real urban space. On this critical view, not only are they unable to live up to their own utopian promises, but also even covertly reproduce the structural conditions of unsustainability. At the same time, a more generous interpretation is possible. The turn to science fiction – reflecting its recent renaissance in popular culture – may suggest that 'story-telling' is one of the few remaining legitimate ways for urban policy-makers to relate to the future. It may be speculated that the 'smart' strands of this discourse specifically have failed to enthuse the general public, partly since they resonate with a long tradition of dystopian science fiction. But insofar as the story-telling has in fact succeeded in mobilising heterogeneous groups of actors who would not otherwise act in concert, the experimental technologies of the smart-eco city are not so much diminished as fundamentally enabled by the science-fictional rhetoric through which they are presented.

Keywords: smart city, eco-city, science fiction, utopian narratives, dystopian narratives.

1. Introduction

This paper builds on the author's subjective observation of a science fiction (SF) aesthetic in the presentation of many contemporary plans for variously conceived future cities. This tendency is not ubiquitous among such plans, or even proposed as a dominant one. Indeed, the purpose of this

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paper is not to illustrate or test the observation, but rather to suggest that this tendency should not be surprising, given the historical relationship between the technologies of urban planning and different types of SF. In effect, the paper outlines a research agenda: it elaborates on a grounded assumption, and speculates on some of its implications.

At the same time, to capture some of the key contemporary tendencies in future city planning, the concept of the 'smart-eco city' is borrowed from a current three-year international research project. The smart-eco city is first defined with reference to the idea of the experimental 'niche', and its science-fictional tendencies are then explored within a broader discussion of the utopianism which it exhibits. It is suggested that a consideration of smart-eco city plans through the lens of SF may go some way to explaining why visions of the 'smart' city future have so far failed to achieve positive resonance in the popular discourse, when compared with the more consensual global appeal of the 'eco-friendly'.

The paper concludes by recognising that the utopian SF rhetoric mobilised in the promotion of the smart-eco city may provide sensible grounds for useful critical evaluations, but also proposes two ways in which it might be understood as a positive attribute.

2. Contemporary tendencies in imagining the future: the experimental 'smart-eco city'

Current thinking about the future of cities is strongly influenced by two broad bodies of discourse. The first, which might be called 'eco-urbanism', has taken hold over the last few decades; the other, that of the 'smart city', has a more recent pedigree. These two tendencies are looked at in turn below, in order to provide a broad delineation of the paper's subject matter.

The international 'mainstreaming' of eco-urbanism has been charted elsewhere (see eg: Joss et al., 2013; Rapoport, 2014). Since the late 1990s, the previously radical idea, that cities might hold the key to resolving environmental problems at local and global levels, has become widely accepted in urban development policy-making at different levels and around the world – a shift catalysed in particular by the spread of the discourse of sustainable development, in which cities have increasingly moved to centre-stage (Myllylä & Kuvaja, 2005; Whitehead, 2012; Joss, 2015). The term 'eco' is used in this paper to describe a wide variety of contemporary urban-level development plans and policies which, though differing in their conceptual underpinnings and practical manifestations, collectively represent an attempt to respond to a series of interrelated contemporary agendas. Among the most prominent of these agendas are: the threat of climate change; concerns over localised pollution and calls for urban environments to be more 'liveable'; the social and environmental impact of ongoing rapid urbanisation in the global South; and the need for post-industrial cities in the global North to reinvent and rebrand themselves (Joss, 2010b).[2]

The eco-city does not represent the first attempt in history to resolve socio-environmental problems by reconfiguring urban space: the twentieth century provides a wealth of examples of what is now

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[2] It should be acknowledged that use of the label 'eco-city' itself appears increasingly to be restricted to large and often new-build urban developments in Asia (see Moir et al., 2014).

labelled 'utopian planning' of different types (see eg: Pinder, 2005; Kargon & Molella, 2008; Joss, 2010a). The earlier eco-city thinking of the 1970s and 1980s, as Roseland (1997: 198) observes, not only drew on a "long line of thinkers and writers whose ideas were precursors to these concepts many decades ago", but more immediately embraced various schools of (largely non-conventional) thought, such as bioregionalism, ecofeminism, appropriate technology, environmental justice, and the Gaia hypothesis – while reversing their largely anti-urban orientation. But it is precisely the globalised nature of the contemporary 'eco-city' (both as an idea which has spread globally, and in the increasing involvement of multinational organisations), and the particular twenty-first century agendas to which it responds (Joss, 2010b), which define it as a coherent contemporary phenomenon. Nevertheless, no consensus has ever been reached about what an eco-city might look like, or how it might be achieved (Rapoport, 2014; Joss, 2015). The eco-city is at best a fuzzy concept, mobilised variously depending on different actors' intentions (Cowley, forthcoming), and is perhaps better understood as a conceptual 'boundary object' performing primarily rhetorical work to allow collaboration between heterogeneous groups of actors (Cowley, 2016).

Alongside concerns for social and economic well-being, eco-city practitioners and theorists have always looked to innovative technologies for solutions, across fields such as transport, energy production and consumption, and waste and water management. Eco-city schemes, indeed, have often been criticised for fetishising technology, or at least for framing their ambitions too strongly in technological terms (see eg: Yigitcanlar & Lee, 2014; Shwayri, 2013; Carvalho, 2015; Caprotti, 2015). Such criticisms problematise the possibility of implementing eco-cities through real-world political and economic processes, and their cultural acceptance; the commonly desired eco-city goal of 'replicability' (Hodson & Marvin, 2010) may lead the actors involved to present a "techno-economic paradigm" (Rydin, 2011: 131) for universal consumption. What results in practice from these globally circulating notions of 'best practice' is liable to be compromised through the process of 'translation' in local contexts (Chang & Sheppard, 2013; Shwayri, 2013).

This traditional technological focus may have been reinforced over time by the tendency towards the involvement of large international companies (Joss et al., 2013) in the hi-tech field among others. Meanwhile, the rise of 'big data'-driven, algorithmic governance practices (see eg: Kitchin, 2014a; Chandler, 2015; Barns, 2016), often promoted by the same international firms, goes some way to explaining why 'eco' urban discourse has become increasingly infused with that of the 'smart' in the last few years. Like the eco-city, the smart city has multiple definitions (Caprotti, 2015: 90; Hollands, 2015). While, in its theorised essence, it envisions the urban as "an incarnation of an immense cloud of Big Data" (Calvillo et al. 2016), in practice the label appears often to refer to a broader set of enabling technologies (see eg: Neirotti et al., 2014), or to be attached retrospectively within policy-making to a wide variety of pre-existing initiatives which may have little to do with the digital (Caprotti & Cowley, 2016). In further reflection of the eco-city, smart urbanism may have policy resonance because it rhetorically entwines a set of otherwise potentially incompatible discursive ambitions: its digital ambitions are aligned with a vision of 'smart people' as well-educated, entrepreneurial innovators working in a knowledge economy (Kitchin, 2014b); are lexically bridged to the urban planning paradigm of 'smart growth', closely related to the ideal of the compact city and 'new urbanism' (Kitchin, 2015; Vanolo, 2014); and dovetail with the appealing notion of efficient

'smart governance' at a time of budget shortfalls for local authorities in many countries (for examples from the UK, see eg: Beresford, 2014; LGA, 2015).

The rise of the smart beside the eco does not, however, mean that the two can straightforwardly be conflated. It seems reasonable to suggest that the 'smart' has not appealed to the lay imagination to the same extent as the 'eco': its earliest incarnations attracted significant critical commentary in the popular media and the academic literature (for an overview, see Kitchin, 2014b). Significant theoretical tensions between the two, furthermore, might be identified: if the 'eco' is underscored by a sense of long-term responsibility, and the normative desirability of intentionally shaping this long-term future (Cowley, 2016), the 'smart' exhibits a non-linear ontology, more concerned with real-time feedback loops and efficiency, sidestepping deliberative decision-making and traditional 'planning' – although such a discussion goes beyond the scope of the current paper. Despite this, the two terms clearly overlap conceptually and in terms of instrumental ambitions, and are often used interchangeably in practice (de Jong et al., 2015). As they appear rhetorically within plans and policies at least, it may reasonably be argued that smart cities can often be interpreted as "basically re-iterations of current eco-city definitions" (Caprotti, 2015: 90).

'Smart' and 'eco' elements of urban initiatives are interwoven in different ways, with varying relative prominence – and both are typically aligned with (or explicitly subordinate to) economic and political strategies. South Korea's Songdo (full name Songdo International Business District) is an oft-cited example of smart city new development, claiming "unrivalled 'smart' infrastructure, which enables many of the city's solutions around transportation, safety and security, disaster management, facilities and management, and citizen information services" (Songdo IBD, undated), but also boasts green credentials in terms of open space and LEED building certification, and has its origins in the previous President's strategy for low-carbon growth. Conversely, the 'eco' is dominant for the city of Heidelberg (Germany): building on a long history of sustainability and CO2 reduction initiatives, and conscious 'green' branding, its focus on improving resource efficiency has meant that smart technologies, including intelligent street lights and in-home smart meters, have been comfortably subsumed within its 'eco' ambitions. The process whereby the smart has gained prominence in broader urban strategic plans over time might be illustrated by the case of Sheffield (UK). Since the collapse of its manufacturing industries in the 1970s and 1980s, Sheffield (UK) has made ongoing attempts to redefine its economic and regional identity. Sustainability was one of the five key principles laid down in Sheffield's strategic plan for 2010-2020 (Sheffield First Partnership, 2010), envisioning the future Sheffield as a 'low-carbon' and 'low waste' city (21), but its post-industrial environmental ambitions have more recently been complemented by the aim of becoming a "smart and connected" city through digital technology and improved digital infrastructure. In the "first iteration" of Sheffield's 'Smart City Strategy' (Dymond, 2015: 2), published last year, the concept of the 'smart' is mobilised to describe a wide variety of activities which extend far beyond the application of 'big data'. The mobilisation of both the smart and eco as two strands of promotional discourse among many is evident in newly-built Sejong City (to take another example from South Korea). In tandem with labelling itself as "one of the greenest cities in the world" (MACCA, undated), Sejong is keen to promote its so-called 'ubiquitous' internet-based services, which provide citizens with "convenience and high technology" (MACCA, 2012: 21) across a wide variety of services. But its

smart and eco characteristics are only two strands of an overall strategy for the city to become an internationally competitive science, education, and innovation cluster, and a series of political agendas including the desire to relieve congestion in the capital city and a longer history of attempts to relocate the institutions of government (Kim, 2011; Cowley, 2015; Kwon, 2015). These are only a small selection of examples of variegated 'smart-eco' ambitions around the world – but all illustrate the way in which the well-established environmental sustainability agenda is widely and increasingly inflected with the discourse of the smart.

In reflection of these contemporary tendencies, the current paper borrows the notion of the 'smart-eco city' from an ongoing international research project Smart-Eco Cities for a Green Economy: A Comparative Study of Europe and China.3 Alongside the presence of hi-tech, digital and green ambitions, the concept refers to:

> an experimental city which functions as a potential niche where both environmental and economic reforms can be tested and introduced in areas which are both spatially proximate (the surrounding region) and in an international context (through networks of knowledge, technology and policy transfer and learning) (Smart Eco Cities, 2016)

To adopt the language of socio-technical transitions theory, the smart-eco city can usefully be theorised as a 'managed' (Rotmans et al., 2001) innovation niche, rather than one which emerges 'from below' (ie through market innovation, or initiated by civil society). The regime actors promoting smart-eco initiatives often explicitly use the language of experimentation and innovation, expressing the hope that the technological solutions tested within the niche can be more broadly applied (often for commercial gain). For example, Manchester's (UK) smart ambitions are heavily focused on a particular 'innovation district' where a variety of high-tech projects are being trialled, with explicitly stated environmental ambitions (Corridor Manchester, 2015: 12). Newcastle's flagship city-centre Science Central initiative is promoted as a 'living laboratory' and 'test bed' for new digital technologies with environmental applications (Science Central, 2015). Songdo describes itself as "a proving ground for next-generation 'smart' city solutions" (Songdo IBD, undated). The Amsterdam Smart City (undated) partnership has defined several of its neighbourhoods as 'urban living labs'.

The notion of the experimental city chimes with the broader tendency towards 'urban experimentation' as a policy mechanism (see eg: Bulkeley & Castán Broto, 2013; Karvonen & van Heur, 2014; Evans et al., 2016). While large new-build cities in Asia (such as Masdar City in the UAE, and the stalled Dongtan Eco-City project near Shanghai, China) have attracted significant media coverage, more typically smart-eco projects are more modest in their immediate ambitions, involving retrofitting particular areas of cities, or adopting innovative approaches to developing new quarters. The transferability of such experiments may appear to be problematic, following Callon et al. (2009), in their subjection to 'translation' when applied to settings elsewhere; yet the contemporary trend towards experimental urban development directly acknowledges this problem. The notion of the urban experiment is fundamentally one of low-risk trial application in real urban

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[3] www.smart-eco-cities.com

space, and its 'learning objectives' are relatively open-ended. In this sense, the practices of smart-eco city development are often far removed from top-down 'utopian' twentieth-century planning approaches to the city. In turn, the question arises of why, as will be discussed in the following section, the smart-eco city should be adopting different forms of utopianism in its presentation to wider publics.

3. Utopian science-fiction aesthetics

Figure 1 below is taken from a large library of images collected by NASA in the 1970s, as part of a programme to envision the colonisation of outer space. On first seeing it, I was struck by its aesthetic similarity to many images accompanying contemporary visions of the smart-eco city, and later by its similarity to the Cooper space station appearing at the end of the 2014 blockbuster film Interstellar. These parallels may appear particular and arbitrary, and the intention of this paper is not to prove or demonstrate their more widespread existence – I lack the methodological tools and the copyright permissions for such an undertaking in any case. Nevertheless, the question of why such similarities might be apparent, even with reference only to these particular examples, seems worth pondering. In speculating on this theme, I am conscious of drawing selectively on certain strands of SF, and slipping between text and imagery, and the media of literature and film; I make no claims to have conducted a comprehensive survey of SF. But if the reader is happy to accept the possibility that the presentation of the real-world technology of the smart-eco city overlaps, or is aligned, with certain strands of SF in certain ways, I would at least like to propose some reasons why this should not strike us as surprising, and to consider some of its possible implications.
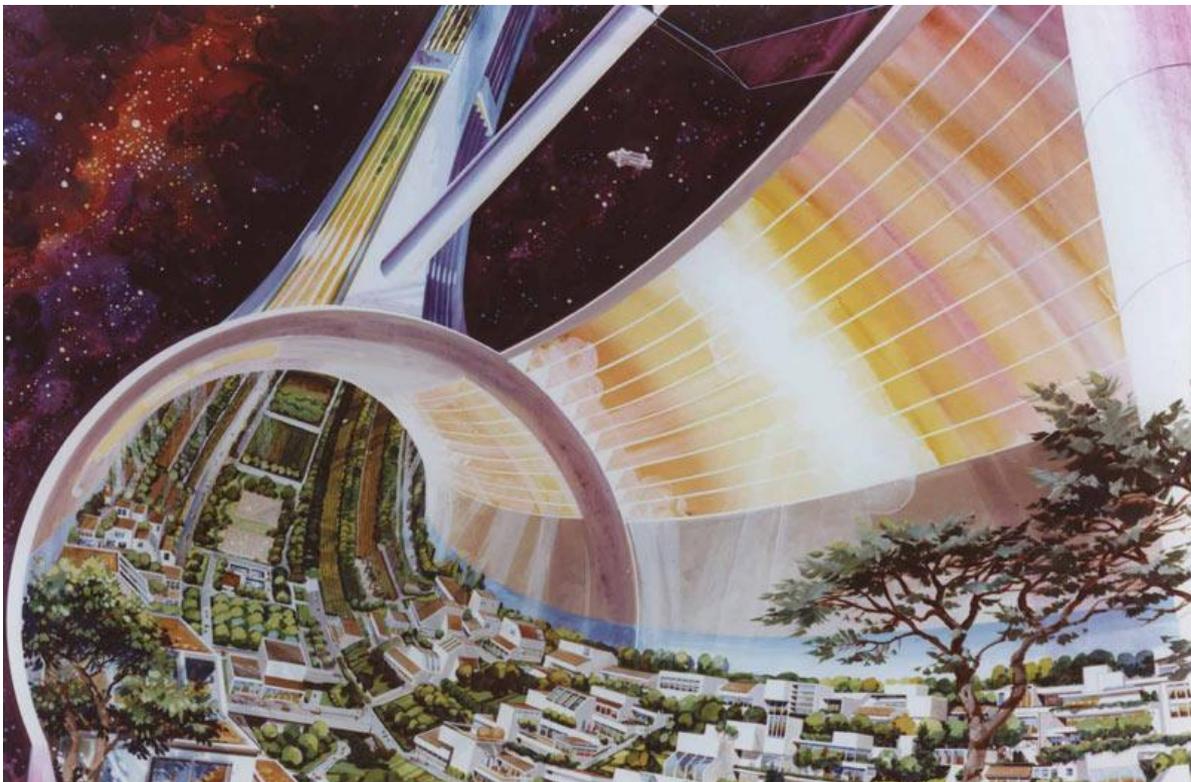

Figure 1: Rick Guidice, Cutaway View of a Toroidal Colony. Photo credit: NASA Ames Research Center

3.1. Smart-eco cities and science fiction

One reason why representations of smart-eco cities, as future oriented bundles of technology, might have a strong science-fictional flavour lies in the longer dynamic historical relationship between technological innovation and SF (Bassett et al., 2013). On the one hand, SF speculates on the ethical and societal implications of contemporary technologies (ibid). On the other, Dourish and Bell (2013) argue, SF provides a collective cultural medium through which emergent technological problems can be imagined long before the practical design has to grapple with them. It may play "an important role in the shaping of desire – for change, for progress, for novelty, for a sense of wonder and of discovery" (Bassett et al., 2013: 2), and technological innovation "often follows on the heels of science fiction, lagging authorial imagination by decades or longer" (Jasanoff, 2015: 1). Detailed plans made in the 1970s to colonise space provide just one example of scientific thinkers taking their lead from fiction (see e.g. O'Neill, 1974).

Echoing this, a reciprocal relationship between science fictional presentations of cities and the practices of urban development has been observed (Kitchin & Kneale, 2001). Cities have often featured as the settings for different forms of speculative fictional prose and cinema (see eg: Sobchack, 1988; Gold, 2001; Abbott, 2007). This is the case both for works set on other planets, and in the use of the city as the "conventional setting when science-fiction film-makers turn their attention away from the extraterrestrial to tackle more earthbound topics" (Gold, 2001: 337). Abbott (2007), meanwhile, considers the role of science fiction as a "particularly interesting and useful way to surface some of the implicit understandings that lie beneath the surface of our society, and even our scholarship" (123), commenting that the grand 'utopian' twentieth-century urban visions of Le Corbusier, Frank Lloyd Wright amount to "what we might call design science fiction" (124) as "extrapolations of the possibilities of new technologies and new cultural values" (124).

3.2. Urban planning and utopia

While 'utopian planning' is associated with the grand schemes of the twentieth-century, the case can be made that all plans are necessarily utopian. A plan in itself – as distinct from any processes of contestation that precede or continue in the wake of its finalisation, or the process through which it is implemented – is fundamentally "about closure – there can only be one decision about whether a development can proceed" (Allmendinger, 2002: 180). Insofar as plans may be modified or abandoned, they might be better understood as "punctuation points" (Innes & Booher, 2015: 206) within ongoing processes of socio-political contestation – but a plan in itself posits a, fictional, static, ideal future state, and proposes a means of arriving at this state.

Accordingly, a plan to develop urban space in a particular way, to achieve particular goals, does not describe a future state, but rather constitutes a particular tool for shaping the future course of development. Abbott (2007) points us towards Myers and Kitsuse's (2000) analysis of the different ways in which planners think about the future. They observe that the need for planners to envision the future is so commonsensical that it is taken for granted; and yet planning has never been well equipped to do so. It has tended to produce either "bland and cautious truisms or blue-sky wish lists are packaged for public consumption" (Myers & Kitsuse, 2000: 222), or "imagined or technical

futures divorced from political realities" (ibid), or merely exercised caution by focusing on the short-term requirements of the electoral cycle (ibid). Myers & Kitsuse see hope for the future in the trend within planning towards the use of building scenarios with "attractive and plausible storylines" about alternative futures, and suggest that science-fiction may serve this purpose well. More generally, it has become widely accepted that urban planning is a type of 'storytelling' about the future (Throgmorton, 2003). Building consensus for action, accordingly, hinges on the persuasiveness of this storytelling (Throgmorton, 2003: 130; van Hulst, 2012: 310).

Rather than constituting a description of a future state conditional on correct implementation, a plan may therefore be conceptualised as a particular story, organised around a vision which "describes a desired future and can take a simple form or can require an entire, complex document to describe" (Shipley & Michela, 2006: 223), and which may or may not motivate action (ibid), depending on how well the story is told. On this level, urban plans have much in common with utopian visions of the 'good society' which, since antiquity, been given spatial form as "the quest for the good city" (Cugurullo, 2013: 68). In parallel with such literary utopias – the lineage of which is conventionally traced to Thomas More's famous work – different groups through history have attempted to put utopian ideas into practice in intentional communities. 'Eco-villages', as experiments in applied 'green utopianism' (Sargisson, 2000a) which follow in this tradition, have an ongoing discursive influence on the eco-city (Rapoport, 2010); significantly, Paolo Soleri's Arcosanti, whose founders' rejection of mainstream society was expressed in an attempt to build a new type of city in the Arizonian desert, is often seen as its earliest forerunner. Both literary utopias (including those present in SF) and intentional utopian communities may typically carry 'transgressive' intent (Sargisson, 2000b): by being "incongruous with the state of reality" (Mannheim, 1960:173), they work to challenge dominant ideological norms. As a "useful source of socio-political truths and inspiration" (Goodwin & Taylor, 1982: 221) utopian thinking helps "relativize the present" (ibid: 28). In the adoption of a utopian SF register, then, and drawing on its countercultural origins, the smart-eco city tells a story of radical change – even if, it might be observed, this rhetorical move is at odds with a typically rather less transformative set of intentions.

If the smart-eco city thereby exploits an alignment between SF and the representational technologies of urban planning, it should be noted that it appears to draw on dystopian narratives as much as utopian ones. In an important sense, it takes its justification from contemporary imaginations of the apocalypse, framed as at other times in history by anxieties about the 'climate' (Hulme, 2008). Erik Swyngedouw (2010) has argued that a populist 'apocalyptic imaginary' (Swyngedouw, 2010) is mobilised by state actors to foreclose democratic debate in favour of techno-managerial governance, to point towards the 'post-political' tendency within contemporary environmentalism (2009; 2010; 2013). But as well as the eco-apocalypse being a narrative constituting a "directly political resource" for state actors (Hammond & Breton, 2016:109), the recent proliferation of 'end of the world' films (Ritzenhoff & Krewani, 2015; Bassett et al., 2013) suggest that it has "considerable popular cultural resonance" (Hammond & Breton, 2016: 109–110). Hammond & Breton speculate that the collapse in modernist left:right politics since the 1980s has left (western) publics with "no readily available structure of meaning through which to make sense of change" (ibid: 107). Eco-apocalypticism strikes a chord in the resulting "discourse of fear or risk

consciousness" (ibid); environmentalism takes on a primarily therapeutic role in an age where we have lost confidence in our agency as political subjects.

3.3. Eco-utopian science fiction

It is in architects' renderings of smart-eco cities that a science-fictional aesthetic is most obviously adopted; some would sit comfortably on the cover of a science fiction novel.4 Beside its portrayal of the colonisation of space, science fiction has also often explored the idea of subterranean dwelling (Beck & Dorrian, 2014) – as perhaps echoed in the plans for an underground eco-city in the Siberian city of Mirny, on the site of a disused diamond mine (Geere, 2010). Imagery such as this seems to be a source of fascination; it is often eagerly circulated, along with accompanying text, on sustainability-related news websites and blogs around the world. If, as John Beck recently observed (Beck, 2014), the theme of the 'exodus' is recurrent in science fiction, then this has clear resonance with the 'eco' orientation of future planned cities in particular. The threat of catastrophe fuels the imagination; the lucky few make plans to escape from the earth's ravaged surface (Beck & Dorrian, 2014). Accordingly, Hodson and Marvin (2010) seek to deflate the rhetoric of urban sustainability by describing a degraded future planet, dotted with 'premium eco-enclaves' reserved for the rich and fortunate.

Across policy and planning documents internationally, the envisionment of desired future cities as solutions to, or an escape from, a coming apocalypse has certain common rhetorical characteristics (Cowley, 2016). Their text is typically replete with recognisable patterns of metaphors which paint a utopian picture of the future. While space does not permit for a full survey of this imagery here, a few examples may suffice to illustrate its main characteristics. First, they are described variously in terms of health, safety, riches, employment, and recreational opportunities for all. The sustainability vision for Almere (Holland) presaged a future which will be "liveable and healthy…a vital community with a wide diversity of living and working possibilities, in a salutary abundance of space, water, nature and cultural landscapes" (Almere, 2009: 8); Sejong City will be "a welcoming environment, abundant green land" (MACCA, 2007: 13); the reconstructed city of Huaibei (China) will enable "the good life for all" (Robert Edson Swain, 2010: 6.4). Second, the space is rhetorically constructed as socially 'flat': it is defined using words such as 'balance', 'integration', 'synthesis' and 'harmony'. Almere will constitute a "synthesis of ecological, social, economic and spatial strategy" (Almere, 2009: 3). In the famously eco-friendly German city of Freiburg's 'charter' (Academy of Urbanism, 2011), we are promised "the assurance of social harmony" (7), with a "balance of people and uses" (10), and a "balanced age and social profile within functioning neighbourhoods" (11); population growth in Huabei will be achieved in a "balanced" way (Robert Edson Swain, 2010: 21), with the city embracing "the potency of living in harmony" (2). A goal of unlimited accessibility is supported by metaphors related to the levelling of impediments and the filling of holes; the resulting space will be one of unhindered interconnections and unimpeded flow. Thus, the OECD in its Cities and Green Growth Framework portrays problems with existing networks as 'gaps' which "impede policy or programmatic activity" and therefore need to be "bridged" (Hammer et al., 2011: 94); the ideal is a city free of "institutional, regulatory and financing resource barriers" (9). Sejong will overcome the

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4 A particularly good example is provided by the rendering of the new environmentally friendly town centre currently under construction in Gwanggyo, near Seoul (see the gallery at MVDRV, undated)

socio-economic "gaps between regions obstacles [sic] in national development" (MCT, 2006: 15). Relatedly, the source domain of 'fabric' is often metaphorically mapped onto the city to evoke an uninterrupted surface. Almere aims "to interlace more and more with the social and cultural structures of the [Randstad] metropolis" (16). The World Bank's Eco2 Cities promotes an "action-oriented approach that knits together cities, their senior or national governments, and their supporters at all levels" (Suzuki et al., 2010:44). So as to "link" its cultural landmarks, the plans for Sustainable Sydney 2030 included a harbourside walking trail, which it describes as a "Cultural Ribbon" (City of Sydney, 2008: 156); Huaibei's plan "seamlessly integrates residential, commercial, park and recreation" (Robert Edson Swain, 2010: 62). Equally, the dichotomy between (externally threatening) 'nature' and the city is similarly erased by collapsing the distinctions between the two in the spatial vision. Auroville is "a human settlement in harmony with nature" (Auroville Foundation, 2001: 1.4.5); Sejong will exhibit "lively urban space in harmony with beautiful scenery" (MACCA, 2007: 22); for Almere, "the city and its environs" are "a single unit" (Almere, 2009: 37); Huaibei will be a "living urban garden" where "agriculture will infuse the city" (Robert Edson Swain, 2010: 30).

3.4. Smart-dystopian science fiction

While the discursive 'storyline' of the older eco-city is thus rhetorically constructed around a pattern of appealing Edenic images, its newer 'smart' incarnation strikes a rather different chord. One suggestion offered by this paper is that smart technology has been narrated primarily with an audience of urban policy-makers and budget holders in mind: its apparently limited popular appeal, on the other hand, is due to its unwitting alignment with a long tradition of consciously dystopian SF.

We might point to E. M. Forster's short story The Machine Stops, published over a century ago (Forster, 1954), which depicts a globally homogeneous world in which the 'Machine' provides every creature comfort. Read from a twenty first-century perspective, the story resonates in rather obvious ways with critical discourses around the individualisation of social relations, e-exclusion, depoliticisation, surveillance, the problems of algorithmic regulation, and the non-neutrality of 'big data', which have been variously levelled at the smart city and related digital technologies in the academic literature and in the popular media. In Forster's future world, all services are available at the press of a button; nobody need ever leave their room; face-to-face contact with others is shunned, except when mediated through screens – and messages sent by 'pneumatic post' are preferred to conversations in person. In place of deliberation, debate, and open-ended intellectual enquiry, individuals seek exposure to pre-framed and mediated 'ideas'; the "clumsy system of public gatherings had long been abandoned" (p.113) in favour of a passive enjoyment of pre-packaged 'lectures' enjoyed from ones armchair. There is no scope for disagreement with the Machine; questioning it may result in 'homelessness'. The Machine operates using a logic whereby "It only gave a general idea of people – an idea that was good enough for all practical purposes" (p.111). It takes a dissenter's voice to observe that the Machine itself is man-made, that it is "much, but it is not everything" (p.110).

Forster's story is only one example of older science fiction among many – and may be seen as having been 'cherry picked' to make an outline case here. Reading it through a contemporary lens may also have a distorting effect: the story is clearly rooted in early twentieth-century humanism. And yet,

the parallels it displays with contemporary critiques of the 'smart' suggest a continuity of folk unease over the promises made by 'techno-utopia'. The story was written, the author explains in his introduction to the collection, "as a reaction to one of the earlier heavens of H. G. Wells" (Forster, 1954: 6).

4. Conclusion

A consideration of the smart-eco through the lens of science fiction has permitted some preliminary reflection on the role of 'story telling' in its spread as an evolving idea and set of practices. The dystopian science-fictional flavour of its contemporary 'smart' orientation, it has been hypothesised, goes some way towards explaining the public ambivalence felt towards it. At the same time, the smart-eco ideal has succeeded in enabling action around the world, and – in its 'eco' guise at least – has become normalised in recent history as an internationally accepted consensus concept. To the extent that this has relied on a type of utopian story-telling, it seems tempting to advocate that critics should seek to debunk this rhetoric, in order to reveal the contingent political and economic agendas which it conceals. Thinking actively about the SF dimensions of the smart-eco city may, in other words, be one way of allowing more fundamental questions to surface, related to its ability to deliver more than unsustainable 'business as usual'.

At the same time, there are two senses in which such critiques may miss the mark. First, the smart-eco city's utopian rhetoric might instead be seen as an enabling characteristic – the story-telling has allowed practices of experimentation to come about by attracting and assembling varied coalitions of otherwise disconnected or mutually antagonistic actors: environmental activists, property developers, tourism and investment boards, politicians at different levels, engineers, urban planners and designers, and IT firms, to name just a few. The resulting variegated and polycentric experiments might more usefully be judged against their local real-world contexts, rather than against the utopian criteria of their science-fictional outward presentation. Second, it may be that story-telling is a significant aspect of planning which has retained validity and acceptability as a way of thinking about the future5, at a time when we have increasingly lost our faith in the traditional, linear, modernist potential of planning (van Assche & Verschraegen, 2008). Rather than retreating into SF as a form of therapy, we may wish to take up the challenge in our postmodern era, following Myers and Kitsuse (2000), of actively embracing the potential for SF to assist us in shaping a more convincingly sustainable collective urban future.

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[5] I am adapting a similar point from Prof John Beck's inaugural lecture (Beck, 2014), made with reference to the use of 'scenario planning' in contemporary future-oriented policy-making.

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The paper should be referenced as follows:

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References

Abbott, C. (2007). Cyberpunk Cities: Science Fiction Meets Urban Theory. Journal of Planning Education and Research, 27(2): 122–131.

Geere, D. (2010). Russia plans domed city in Siberian mine. Online: http://www.wired.co.uk/news/archive/2010-11/17/russia-domed-city-siberia (accessed 20 May 2016).

Allmendinger, P. (2002). Planning Theory. Basingstoke: Palgrave Macmillan.

Almere (2009). Summary, Draft Structural Vision Almere 2.0. Online: http://english.almere.nl/fileadmin/files/almere/subsites/english/Draft_strategic_vision_Almere_2.0.pdf (accessed 26 January 2013).

Amsterdam Smart City Partnership (undated). Living Labs. Online: http://amsterdamsmartcity.com/projects/living-labs (accessed 10 May 2016).

van Assche, K. & Verschraegen, G. (2008). The Limits of Planning: Niklas Luhmann's Systems Theory and the Analysis of Planning and Planning Ambitions. Planning Theory, 7(3): 263–283.

Auroville Foundation (2001). The Auroville Universal Township Master Plan (Perspective: 2025). Online: www.auroville.info/AUCR/masterplan/index.htm (accessed 18 December 2012).

Barns, S. (2016). Mine your data: open data, digital strategies and entrepreneurial governance by code. Urban Geography, Advance online version: DOI 10.1080/02723638.2016.1139876.

Bassett, C., Steinmueller, E. & Voss, G. (2013). Better Made Up: The Mutual Influence of Science Fiction and Innovation. Nesta Working Paper No. 13/07. Online: http://www.nesta.org.uk/sites/default/files/better_made_up_the_mutual_influence_of_science_fiction_and_innovation.pdf (accessed 13 March 2014).

Beck, J. (2014). Catastrophic Futures and Applied Fiction. Inaugural lecture. University of Westminster, 5 March.

Beck, J. & Dorrian, M. (2014). Postcatastrophic Utopias. Cultural Politics, 10(2): 132–150.

Beresford, M. (2014). Smart People Smart Places: Realising Digital Local Government. London: New Local Government Network http://www.nlgn.org.uk/public/wp-content/uploads/Smart-People-Smart-Places.pdf (accessed 26 April 2016).

Bulkeley, H. & Castán Broto, V. (2013). Government by experiment? Global cities and the governing

of climate change. Transactions of the Institute of British Geographers, 38(3): 361–375.

Callon, M., Lascoumes, P. & Barthe, Y. (2009). Acting in an Uncertain World: An Essay on Technical Democracy. Cambridge, MA: MIT Press.

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

Caprotti, F. & Cowley, R. (2016). Smart Cities UK 2016. London: King's College London. Online: http://www.smart-eco-cities.org/wp-content/uploads/2016/03/Kings-College-London-UK-Smart-Cities-Survey-2016-summary.pdf (accessed 26 April 2016).

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

Chandler, D. (2015). A World without Causation: Big Data and the Coming of Age of Posthumanism. Millennium: Journal of International Studies, 43(3): 833–851.

Chang, I.-C.C. & Sheppard, E. (2013). China's Eco-Cities as Variegated Urban Sustainability: Dongtan Eco-City and Chongming Eco-Island. Journal of Urban Technology, 20(1): 57–75.

City of Sydney (2008). Sustainable Sydney 2030: The Vision. Sydney: City of Sydney.

Corridor Manchester (2015). Corridor Manchester – A Decade of Opportunity: Strategic Vision to 2025. Online: http://www.corridormanchester.com (accessed 12 March 2016).

Cowley, R. (2015). In defence of top-down sustainability planning: the case of Sejong City. In: J. Condie & A. Cooper (eds.) Dialogues of sustainable urbanisation: Social science research and transitions to urban contexts. Penrith: University of Western Sydney, 36–40.

Cowley, R. (2016). Eco-Cities: Technological Showcases or Public Spaces? PhD Thesis. London: University of Westminster.

Cowley, R. (forthcoming). Eco-Cities. In Shwamen, T. & van Kempen, R. (eds.) Handbook of Urban Geography. Cheltenham: Edward Elgar.

Cugurullo, F. (2013). The Business of Utopia: Estidama and the Road to the Sustainable City. Utopian Studies, 24(1): 66–88.

Dourish, P. & Bell, G. (2013). 'Resistance is futile': reading science fiction alongside ubiquitous computing. Personal and Ubiquitous Computing, 18(4): 769–778.

Dymond, C. (2015). Smart Sheffield. Version 1.0. Online: https://www.sheffieldfirst.com/dms/sf/management/corporate-communications/documents/SFP/SEB-Papers/February-2015/Item-4---Sheffield-Smart-City-Framework/Item%204%20-%20Sheffield%20Smart%20City%20Framework.pdf (accessed 27 March 2016).

Evans, J., Karvonen, A. & Raven, R. (eds.) (2016).The Experimental City. London: Routledge,

Forster, E.M. (1954). The Machine Stops. In: E. M. Forster: Collected Short Stories. Harmondsworth: Penguin, 109–146.

Gold, J.R. (2001). Under Darkened Skies: The City in Science-fiction Film. Geography, 86(4): 337–345.

Goodwin, B. & Taylor, K. (1982). The Politics of Utopia: A study in theory and practice. London: Hutchinson University Library.

Hammer, S., Kamal-Chaoui, L., Robert, A. & Plouin, M. (2011). Cities and Green Growth: A Conceptual Framework. OECD Publishing. Online: http://www.oecd-ilibrary.org/governance/cities-and-green-growth_5kg0tflmzx34-en (accessed 16 August 2015).

Hammond, P. & Breton, H.O. (2016). Eco-Apocalypse: Environmentalism, Political Alienation, and Therapeutic Agency. In: K. A. Ritzenhoff & A. Krewani (eds.) The Apocalypse in Film: Dystopias, Disasters, and Other Visions about the End of the World. Lanham, MD: Rowman & Littlefield, 105–116.

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

Hollands, R.G. (2015). Critical interventions into the corporate smart city. Cambridge Journal of Regions, Economy and Society, 8(1): 61–77.

Hulme, M. (2008). The conquering of climate: discourses of fear and their dissolution. Geographical Journal, 174(1): 5–16.

van Hulst, M. (2012). Storytelling, a model of and a model for planning. Planning Theory, 11(3): 299–318.

Innes, J.E. & Booher, D.E. (2015). A turning point for planning theory? Overcoming dividing discourses. Planning Theory, 14(2): 195–213.

Jasanoff, S. (2015). Future Imperfect: Science, Technology, and the Imaginations of Modernity. In: S. Jasanoff & S.-H. Kim eds. Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power. Chicago, IL: Chicago University Press, 1–33.

Joss, S. (2010a). Accountable governance, accountable sustainability? A case study of accountability in the governance for sustainability. Environmental Policy and Governance, 20(6): 408–421.

Joss, S. (2010b). Eco-cities - a global survey 2009. WIT Transactions on Ecology and The Environment, 129: 239–250.

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

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

Kargon, R. & Molella, A. (2008). Invented Edens: Techno-Cities of the 20th Century. Boston, MA: MIT Press.

Karvonen, A. & van Heur, B. (2014). Urban Laboratories: Experiments in Reworking Cities. International Journal of Urban and Regional Research, 38(2): 379–392.

Kim, J.-I. (2011). The New Capital plan: a South Korean case. The Journal of Architecture, 16(2): 191–211.

Kitchin, R. (2015). Making sense of smart cities: addressing present shortcomings. Cambridge Journal of Regions, Economy and Society, 8(1): 131–136.

Kitchin, R. (2014a). The Data Revolution: Big Data, Open Data, Data Infrastructures and Their Consequences. London: SAGE.

Kitchin, R. (2014b). The real-time city? Big data and smart urbanism. GeoJournal, 79(1): 1–14.

Kitchin, R. & Kneale, J. (2001). Science fiction or future fact? Exploring imaginative geographies of the new millennium. Progress in Human Geography, 25(1): 19–35.

Kwon, Y. (2015). Sejong Si (City): are TOD and TND models effective in planning Korea's new capital? Cities, 42(B): 242–257.

LGA (2015). Transforming local public services using technology and digital tools and approaches. London: Local Government Association http://www.local.gov.uk/productivity/-/journal_content/56/10180/6357119/ARTICLE (accessed 26 April 2016).

Living PlanIT (undated). Who We Are. Online: http://www.living-planit.com/about.html (accessed 21 May 2016).

MACCA (2007). Happy City Sejong. Geumnam-myeon, Yeongi-gun: Multifunctional Administrative City Construction Agency.

MACCA (2012). The City of Happiness Sejong. Sejong City: Multifunctional Administrative City Construction Agency.

MACCA (undated). Sejong: Asia's Green Metropolis of the Future. Geumnam-myeon, Yeongi-gun: Multifunctional Administrative City Construction Agency.

Mannheim, K. (1960). Utopia and Ideology. London: Routledge and Kegan Paul.

MCT (2006). Master Plan for Construction of Multi-functional Administrative City. Seoul: Ministry of Construction & Transportation.

Moir, E., Moonen, T. & Clark, G. (2014). What Are Future Cities? Origins, Meanings and Uses. London: Report for Future of Cities Project / Future Cities Catapult. Foresight, Government Office for Science.

MVDRV (undated). Power Center. Online: http://www.mvrdv.nl/en/projects/417_gwanggyo_power_center (accessed 1 November 2014).

Myers, D. & Kitsuse, A. (2000). Constructing the future in planning: A survey of theories and tools. Journal of Planning Education and Research, 19(3): 221–231.

Myllylä, S. & Kuvaja, K. (2005). Societal premises for sustainable development in large southern cities. Global Environmental Change, 15(3): 224–237.

Neirotti, P., De Marco, A., Cagliano, A.C., Mangano, G. & Scorrano, F. (2014). Current trends in Smart City initiatives: Some stylised facts. Cities, 38: 25–36.

O'Neill, G.K. (1974). The colonization of space. Physics Today, 27 (9): 32–40.

Pepper, D. (2005). Utopianism and Environmentalism. Environmental Politics, 14 (1): 3–22.

Pinder, D. (2005). Visions of the City: Utopianism, Power and Politics in Twentieth-Century Urbanism. New York: Routledge.

Rapoport, E. (2010). Defining the sustainable city: the discourses and convictions behind the eco--city. Unpublished paper presented at the Summer Symposium on Sustainable Systems, Sanaas, Finland. Online: http://engd-usar.cege.ucl.ac.uk/project/view/idprojects/9#outputs (accessed 15 February 2012).

Rapoport, E. (2014). Utopian Visions and Real Estate Dreams: The Eco-city Past, Present and Future. Geography Compass, 8(2):137–149.

Ritzenhoff, K.A. & Krewani, A. eds. (2015). The Apocalypse in Film: Dystopias, Disasters, and Other Visions About the End of the World. London: Rowman & Littlefield.

Robert Edson Swain (2010). Huaibei Eco-City Master Plan & Huaibei Mining Subsided Area Eco-Restoration Plan. Online: www.robertedsonswain.com (accessed 15 December 2012).

Roseland, M. (1997). Introduction: Dimensions of the Future: An Eco-city Overview. In: M. Roseland (ed.) Eco-city Dimensions: Healthy Communities, Healthy Planet. Gabriola Island, B.C., Canada: New Society Publishers, 1–12.

Rotmans, J., Kemp, R. & van Asselt, M. (2001). More evolution than revolution: transition management in public policy. foresight, 3(1): 15–31.

Rydin, Y. (2011). The purpose of planning: Creating sustainable towns and cities. Bristol: Policy Press. Online:
http://www.dawsonera.com/depp/reader/protected/external/EBookView/S9781847425850/S9 (accessed 2 July 2012].

Sargisson, L. (2000a). Green Utopias of self and others. Critical Review of International Social and Political Philosophy, 3 (2-3): 140–156.

Sargisson, L. (2000b). Utopian Bodies and the Politics of Transgression. London: Routledge.

Science Central (2015). Science. Central to Your Future. Marketing Brochure. Online: http://www.newcastlesciencecentral.com/wp-content/uploads/2016/03/Science-Central-brochure-updated-oct-15-FINAL-small.pdf (accessed 10 May 2016).

Sheffield First Partnership (2010). Sheffield 2020: The Sheffield City Strategy 2010-2020. Sheffield:

Sheffield First Partnership. Online: https://www.sheffieldfirst.com/key-documents/city-strategy.html (accessed 27 March 2016).

Shipley, R. & Michela, J.L. (2006). Can vision motivate planning action? Planning Practice & Research, 21(2): 223–244.

Shwayri, S. (2013). A Model Korean Ubiquitous Eco-City? The Politics of Making Songdo. Journal of Urban Technology, 20(1): 39–55.

Smart Eco Cities (2016). About the Project. Online: http://www.smart-eco-cities.org/about-the-project (accessed 24 April 2016).

Sobchack, V. (1988). Cities on the Edge of Time: The Urban Science Fiction Film. East-West Film Journal, 3(1): 4–19.

Songdo IBD (undated). About. Online: http://songdoibd.com/about (accessed 21 May 2016).

Suzuki, H., Dastur, A., Moffatt, S., Yabuki, N. & Maruyama, H. (2010). Eco2 Cities: Ecological Cities as Economic Cities. Washington, DC: World Bank. Online: http://siteresources.worldbank.org/INTEASTASIAPACIFIC/Resources/Eco2_Cities_Brochure.pdf (accessed 12 May 2016).

Swyngedouw, E. (2010). Apocalypse Forever? : Post-political Populism and the Spectre of Climate Change. Theory, Culture & Society, 27(2–3): 213–232.

Swyngedouw, E. (2009). The Antinomies of the Postpolitical City: In Search of a Democratic Politics of Environmental Production. International Journal of Urban and Regional Research, 33(3): 601–620.

Swyngedouw, E. (2013). The Non-political Politics of Climate Change. Acme Journal, 12(1): 1–8.

Throgmorton, J.A. (2003). Planning as Persuasive Storytelling in a Global-Scale Web of Relationships. Planning Theory, 2(2): 125–151.

Vanolo, A. (2014). Smartmentality: The Smart City as Disciplinary Strategy. Urban Studies, 51(5): 883–898.

Whitehead, M. (2012). The sustainable city: an obituary? On the future form and prospects. In: J. Flint & M. Raco (eds.) The future of sustainable cities: Critical reflections. Bristol: Policy Press, 29–46.

Yigitcanlar, T. & Lee, S.-H. (2014). Korean ubiquitous-eco-city: A smart-sustainable urban form or a branding hoax? Technological Forecasting & Social Change, 89: 100–114.