Imagination for change: The Post-Fossil City Contest

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A B S T R A C T

The transition to a less carbon-dependent society is arguably one of the most pressing issues of our time. As carbon is deeply embedded in contemporary western culture, this transition requires a deep reconsideration of cultural values. Art and design can be helpful in opening up this debate and imagining alternative futures. However, not much is known about *how* such interventions work. In this exploratory paper, we analyse a futuring intervention in which we were closely involved as organisers and curators–*the Post-Fossil City Contest.* This international competition aimed at imagining a city beyond carbon received 250 entries and resulted in a public exhibition at the municipal building in Utrecht, the Netherlands. The ideas developed by the finalists of the *Post-Fossil City Contest*: inspired us to develop the notion of '*imaginative logics*': the set of principles underlying or constituting an imaginative intervention, by means of which an abstract phenomenon is made present to the audience. Linking our empirical observations to the speculative design and experiential futures literature, we distinguish between doable, juxtaposing, defamiliarizing, guerilla and procedural imaginative logics. This typology can be a starting point for further research into how and when to apply what kind of futuring intervention.

1. Introduction

The transition to a more sustainable world is arguably one the most pressing issues of our time. Mitigating the negative consequences of climate change requires a radical shift away from fossil fuels like coal, oil and natural gas. Given the fact that fossil fuels are a deeply engrained aspect of current societies, a 'deep transition' is required, in which practices, culture and social arrangements are rethought (Schot & Kanger, 2018). At this time, however, our ability to envision climate change is limited. Imaginations of climate change tend to be cast in elaborate policy reports and increasingly alarming quantitative models like those that have been developed by the Intergovernmental Panel on Climate Change (IPCC) over the last decades (e.g. Edenhofer et al., 2014). In the public realm, climate change is typically illustrated through the image of melting ice[1] (Doyle, 2007). In reflecting on this kind of discourse, various authors point out that we face a 'crisis of the imagination', and that we lack the stories necessary to come to grips with the elusive topic of climate change (Ghosh, 2016; Morton, 2013).

If it is problematic to envisage climate change, it is even more difficult to imagine *beyond* the fossil era (Hajer & Versteeg, 2018). With regard to post-fossil cities, our futuring topic of interest, dominant imaginations focus either on corporate driven technological fixes, like smart cities or self-driving cars, or on low-tech bottom-up experiments and small-scale initiatives. Tozer and Klenk (2018)

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identify the dominant imaginaries in self-declared carbon neutral cities. These imaginaries focus chiefly on technology, the energetic implication of carbon neutrality and the experimental approach of coming to carbon neutrality. In contrast, there is very little attention to the everyday intricacies of urban life after carbon. Terms like 'decarbonization' and 'CO$_2$-neutral' address the problems of our current world, but these descriptions are limited to what the situation beyond the fossil era *should not* be and seem unable to sketch a vision of what it *could be* like.

This poverty of ideas beyond an urban life based on fossil fuels is particularly problematic because imaginations of the future are performative; they can function, though not in a linear way, as self-fulfilling prophecies (Beckert, 2016; Jasanoff & Kim, 2015; Van Lente, 2012). An example can be found in the behavior of business investors, who act not merely upon their observations of the present but let themselves be guided by their expectations of the future. As Beckert (2013, p. 221) notes: 'it is the images of the future that shape present decisions'. Another example of the performativity of future imaginations is the neo-liberalist dictum of TINA (There Is No Alternative), frequently used by the former British prime minister Margaret Thatcher. TINA might be the most famous (or notorious) example of a particular imagination that, by its restrictive presentation of possible futures, limits the capabilities for imagination and action.

Recent scholarship points to the importance of 'plausible and desirable futures' that could contribute to the transition to a more sustainable socio-ecological system (Bai et al., 2016; McPhearson, Iwaniec, & Bai, 2016). This perspective is grounded in academic work about system dynamics, complexity, socio-ecological resilience and the idea of the Anthropocene (e.g. Bennett et al., 2016; Steffen et al., 2011). However, rather than trusting that more scientific data about human-caused biophysical problems like climate change will lead to improvement, it emphasizes the importance of positive examples ('good seeds') in the present and desirable yet plausible constructions of the future to bring about change.

Both desirability (what do we want to happen?) and plausibility (what is likely to happen?) are difficult to grasp in a single construction of the future. What is desired is, after all, typically a point of contestation and how the future will unfold is inherently uncertain. Using scenarios is one way to cope with this uncertainty in decision making. Scenarios can be defined as coherent narratives about futures which differ strongly on a set of dimensions of uncertainty that are deemed to be important for taking decisions (e.g. Berkhout, Hertin, & Jordan, 2002; Eker, van Daalen, & Thissen, 2017). This multiplicity of – not necessarily desirable – perspectives on the future is increasingly accompanied by simulations showing the quantified impacts of different storylines. A particular form is 'backcasting', in which the pathways to one or multiple end states in the future are mapped (Dreborg, 1996; Geels, Berkhout, & van Vuuren, 2016). Scenarios are widely used in different fields, including climate change (van Vuuren et al., 2018) and land use planning (Hopkins & Zapata, 2007).

However, as Candy and Dunagan (2017, p.137 – emphasis added) reflect on the use of scenarios and other tools in futuring practice, there is a 'need and opportunity to engage people more *viscerally* in futures conversations, which typically had high stakes but low affective engagement and embodied insight'. Stuart Candy and colleagues use the concept and practice of 'experiential futures', a 'happy marriage' between design studies and futures studies (Candy, 2010; Candy & Dunagan, 2017; Rijkens–Klomp, Baerten, & Rossi, 2017). From more traditional futures studies this approach takes the engagement with grasping trends and desirable future states through approaches like visioning and scenarios. Critical, however, is the difference in form; rather than written reports or PowerPoint presentations, experiential futuring interventions make possible futures tangible. By providing an immersive futuring experience, such interventions involve a wider range of perceptual systems than conventional methods would and may address a broad gamut of ways of knowing (e.g. Cross, 2006; Gibson, 1966; Lucas, 2009). Design thinking and critical design practices are an important source of inspiration for experiential futuring interventions. A case in point is 'discursive design', which refers to:

> (…) tools for thinking; they raise awareness and perhaps understanding of substantive and often debatable issues of psychological, sociological, and ideological consequence. Discursive design is the type of work that is generally less visible in the marketplace (though it can certainly exist there), but rather is most often seen in exhibition, print, film, and in the research process (Tharp & Tharp, 2013, p. 406–407).

Contrary to what the term might seem to imply, discursive design is not primarily concerned with words; it still produces objects that may function in the everyday world, but the primary goal of these objects is to encourage thought processes and debate (Tharp & Tharp, 2013). In a similar vein, Dunne and Raby (2013) propose to use design as a way to imagine possible futures, and to speculate about what might be (cf. Auger, 2013). The tangible nature of design objects makes possible an engagement with phenomena that would otherwise remain abstract (cf. Candy, 2010). Or as researchers from a project about sensing energy reflect on the added value of design:

> (…) when a rather radical suggestion, for example the wind powered washing machine on the roof, is thoroughly investigated and visualized in an architectural and designerly manner it ceases to be incredible and becomes inhabitable and realistic, something one can relate to and weave a social and everyday practice around – a story of the everyday (Broms, Wangel, & Andersson, 2017, p.203 – emphasis added).

In this paper, we engage with the literature on experiential futures and discuss an futuring intervention in which we were both involved: the Post-Fossil City Contest. We use this case as the basis for a conceptual analysis, building on the observation by Candy and Dunagan (2017, p. 150) that 'perhaps the central challenge for a next generation of foresight practitioners will be related to designing circumstances or situations in which the collective intelligence and imagination of a community can come forth'. Rather than focusing on the question *whether* we need more imagination, we use the setup and content of the Post-Fossil City Contest as an opportunity to explore *how* various imaginative approaches may work.

Box 1: Transdisciplinary research approach

Transdisciplinary perspective

The Post-Fossil City Contest was set up as a transdisciplinary research project. A key premise of transdisciplinary research is that research questions are steered by societal concerns, rather than to obtain 'knowledge for the sake of knowledge' (e.g. Mitchell, Cordell, & Fam, 2015). The Post-Fossil City Contest was transdisciplinary in both the organization of the research *process* and the intended *outcome*. With regards to the *process*, stakeholders from different backgrounds (policymakers, artists, designers) were involved throughout the process (cf. Lang et al., 2012). The jury that selected both the ten finalists and the winner of the contest had a multidisciplinary background, consisting of policymakers, artists, designers and academics to ensure different perspectives were included. Multiple stakeholders were involved as well in the process of curating the winning submissions, setting up a communication strategy and organizing the exhibition. The ongoing conversation with the ten finalists provided an important basis for the development of the notion of 'imaginative logics' (see Section 3).

With regards to the *outcome* of transdisciplinary research, Mitchell et al. (2015) discern three types of outcome spaces: (1) an improvement within the 'situation', (2) the generation of relevant stocks and flows of knowledge, and (3) mutual and transformational learning. Initially, the Post-Fossil City Contest aimed primarily for improvement within the situation. The call text asked for better ways to imagine the city of the future without fossil fuels; the contest aimed to contribute to solving the societal crisis of the imagination (see Section 1). Looking back, the contest and the publicity provided by it, helped perhaps primarily to generate flows of knowledge, in particular by introducing the value of imaginative and experiential approaches both into the Dutch debate and to a lesser extent the international discourse on climate change and urban planning. Moreover, the collaborative work with the finalists engendered a process of mutual learning regarding the connection between artistic imagination and policy debates. In a number of cases, this resulted in fruitful working relationships, which continued after the Post-Fossil City Contest had ended.

Research methods and data

The insights presented in this article are based both on the observations of the authors as written down during the process and on two additional ex post analyses. With regards to the latter, we first scanned the online and offline media that reported on the Post-Fossil City Contest or one of the finalists and selected the articles in which the journalist wrote an original piece. We excluded the media utterances that copied our press release or conducted interviews with organizers of the Post-Fossil City Contest. We show fragments of these media presentations in our analysis; they demonstrate how journalists interpreted the futuring interventions, and how they chose to present them to their readers (for an overview see Appendix Table A1). Second, we conducted interviews with nine of the ten finalists around a year after the exhibition (the tenth finalist could not be interviewed due to personal circumstances). The interviews were conducted face-to-face or by phone and in one instance by e-mail. The purpose of these interviews was to get a better understanding of the choices the finalists made and the principles they applied. All interviews were recorded and all the relevant parts were transcribed.

It would have been valuable to conduct a range of interviews with stakeholders (curators, finalists etc.) and expo visitors during the expo. However, with a small team and high time pressure, the day to day demands and practicalities of the project took precedence over the recording of results. For instance, while we had many conversations with visitors of the exhibition, no systematic analysis of participants' perceptions was conducted (cf. Bendor et al., 2017).

2. The Post-Fossil City Contest

2.1. The idea: a call to arts

The Urban Futures Studio (UFS), a transdisciplinary research institute at Utrecht University, started preparations for the Post-Fossil City Contest in late 2016, with the aforementioned crisis of the imagination as underlying rationale. The initiators' diagnosis: cities are crucial for societies to move beyond carbon dependency, but the current debate is dominated by corporate imaginaries of self-driving cars and other smart technologies. This technological vision does little right to the complexities of the urban fabric and fails to consider how transitions towards a post-fossil society could influence future social inclusion and democratic quality in different ways. The Post-Fossil City Contest was organized in reaction to this poverty of the imagination and intended to help broaden the debate about post-fossil futures. A key aspect of the contest was that it left no room for the question whether or not anthropogenic climate change was 'real', or whether the transition to a post-fossil society was necessary. Instead, the call text took it as a given that societies need to move beyond carbon dependency, and that art and design are crucial to imagine, explore and scrutinize the city of the future. A manifesto[2] provided potential contest participants with this theoretical background. The online text stressed the ways in which guided imagination had once been crucial in carving out a role for the car (Norman Bel Geddes' Futurama at the 1939 World Exhibition, designed for General Motors, is probably the most famous example) and argued that we need art and design – again – to shape the city of the future, albeit in a more diverse and ambiguous way than in those famous examples of the past.

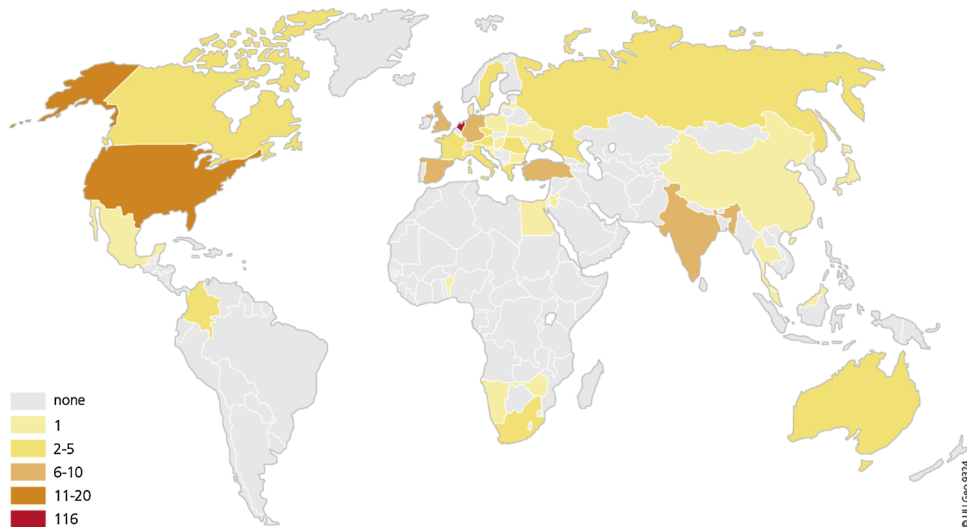[2] The full call text can be read here: http://postfossil.city/en/call.

Fig. 1. Country of residence of the submission team (n = 250).

In January 2017, the UFS publicly launched the Post-Fossil City Contest, by sending out a call that invited artists, designers and other 'creatives' to submit an idea for a post-fossil city of the future. This submission had to consist of a short description of the idea and a brief plan to execute it. There were no restrictions on form; the only constraint was that the idea had to be displayed in an exhibition space eventually. Out of all submissions ten finalists would be selected, who each would get €1000,- to realize their idea. The message of this call was conveyed via different means to three different audiences. The primary addressees were artists and other makers; success or failure of the contest would depend on the quality and quantity of the submissions. To reach the intended participants, the contest call was published online in both Dutch and English and launched via a so-called Thunderclap campaign on Twitter and Facebook. Flyers and posters were distributed among relevant educational institutions and at cultural venues. Team members visited various art and design schools to tell students about the contest, to answer questions and invite submissions. A second important audience consisted of policy makers and experts. Relationships with this second target group were close from the beginning, not in the least place because the contest was sponsored by the Dutch Ministry of Infrastructure and Environment and the Municipality of Utrecht. To ensure policy relevance, high level civil servants had seats in the jury that would select the ten finalists and finally the winner. Finally, the contest should attract the attention of a more general public, without a predefined interest in climate change or post-fossil living. An active campaign helped to ensure that national newspapers published about the contest: *NRC Handelsblad* published an interview with the jury chair, whereas the online news platform *De Correspondent* published the entire call text complemented with pictures and video material.

The call proved successful: 250 ideas from all over the world were submitted (see Fig. 1). The vast majority of these ideas originated in the Netherlands, but other submissions came from the U.S. (20), Germany, the U.K. (8), South Africa (4), and India (8). The ideas varied significantly in terms of both form and topic and were submitted by groups from various disciplinary backgrounds: amongst others, architects (87), artists (23), designers (21) and urban planners (18). Once these 250 submissions were received, the next phase started: the curation.

2.2. The curation

The curation consisted of two steps: the selection of ten finalists and the interactive development of these ideas leading up to an exhibition. For the first step, each of the authors made an individual pre-selection of the 250 ideas on the basis of the criteria: 1.) imaginative power, 2.) potential for further development, 3.) detail/rigor and 4.) (visual) appeal. 'Imaginative power' was the criterion most closely linked to the call of the contest. Each of the finalists got a score of 1 (strong), 2 (medium) or 3 (weak). A short deliberation process after comparing the two individual selections resulted in the forwarding of 60 preselected submissions to the jury.

The jury applied seven very similar criteria in selecting the ten finalists: 1.) appeal, 2.) feasibility, 3.) diversity within the selection of ten, 4.) potential to show the idea at an exhibition and 5.) quality and motivation of the team and 6.) the imaginative power of the idea and 7.) the idea had to be post-fossil. These criteria were developed by the jury chair after consulting with the two authors of this paper. Each of the jury members had made a short list of candidates and provided elaboration in different ways (grades, textual elaboration), but these lists varied significantly. In particular, a difference was observed between jury members with a policy orientation, favoring rather concrete and realizable submissions, and jury members with a philosophical, artistic or design background, emphasizing imaginative power and the potential to think beyond what we already know. The jury chair had to work hard to reach a consensus; criterion 3 (diversity in the selection of ten) played a central role in the final selection.
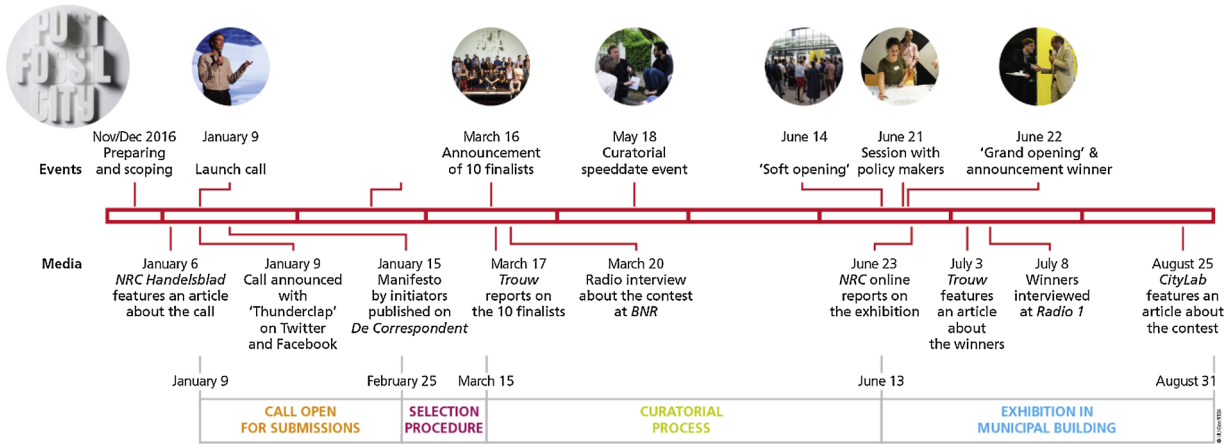
Fig. 2. Timeline of the Post-Fossil City Contest.

Several media outlets paid attention to the selection of the ten finalists (see Fig. 2, see Table 1 for an overview of the finalists), which were announced during a festive evening. After this evening the Post-Fossil City Contest went 'undercover' for three months to shape the ideas; step two of the curation phase.

During these 'undercover' months, the curatorial team, consisting of the two authors of this paper and two experienced curators, worked together with the finalists on their idea. We interacted intensively with the finalists to help them develop their object, both through bilateral meetings and group meetings. Feedback to finalists focused in particularl on how their intervention would fit in the overall narrative of the Post-Fossil City Contest and how the engagement with the audience could take shape both online and at the exhibition.

2.3. The exhibition and announcement of the winner

On June 14, 2017, the Post-Fossil City exhibition was opened by the Alderman for Sustainability in Utrecht and ran for 2.5 months. The exhibition took place in the municipal building of the Municipality of Utrecht, a public space right next to the largest train station in the Netherlands. About 3000 people pass the hall on a daily basis, ranging from civil servants to residents of Utrecht extending their driver's license. Because of the substantial visual competition in the municipal building, a design studio was asked to develop a distinctive spatial grid for the exhibition. The exhibition design was that of an oil landscape, consisting of ten grey oil terminals (cylinders) out of which the ideas of the finalists emerged in yellow (Fig. 3). The exhibition grid was very strict; the cylinders provided specific spatial constraints, to ensure a coherent look for the exhibition as a whole. During the early discussions, several finalists felt that this limited their artistic freedom, and many of the curational talks involved discussions as to how the given materiality of the grids could be linked to their ideas. A week after the opening, on June 22, 2017, the jury announced the winner of the Post-Fossil City Contest: the Ark of the Newest Covenant (see 3.4 for more elaboration). This time, the consensus was reached relatively easily; for many jury members the Ark stood out in terms of imaginative power, esthetic detail and implementation logic.

3. Imaginative logics

What can we learn from the Post-Fossil City Contest? In particular: can we come to a better understanding of the different ways in which various imaginative approaches present possible futures in the here and now? Designing a futuring intervention is a situated craft that combines different experiences, understandings and sensorial systems. Futuring interventions can have widely different goals, but in order to be heard or understood, they need to connect visions of the future – often abstract or far-fetched – with present understandings. Auger (2013) uses the notion of 'perceptual bridge' to describe this:

> One of the key factors responsible for the success of a speculative design project is the careful management of the speculation; if it strays too far into the future to present implausible concepts or alien technological habitats, the audience will not relate to the proposal resulting in a lack of engagement or connection. In effect, a design speculation requires a bridge to exist between the audience's perception of their world and the fictional element of the concept (Auger, 2013, p.12)

Because of the need for this bridge, any imaginative futuring intervention is a *pars pro toto*: it entails a choice not only in terms of its content (which subject matters are addressed), but also in terms of its inner logic (which form is chosen to address and convey these subject matters). Each step towards a more concrete and experiential presentation of a possible future, involves, in the framing of Candy and Dunagan (2017) both a choice and an imaginative leap. In order to better distinguish between the different ways in which futuring interventions may manage speculation about the future to engage their audiences, we introduce the concept of 'imaginative logic', which we define as *the set of principles underlying or constituting an imaginative intervention, by means of which an abstract phenomenon is made present to the audience.* The nature of a phenomenon such as 'the future' is necessarily undetermined;

Table 1
Overview of the 10 finalists.

Name	Description of submission	Picture
1. The Ark of the Newest Covenant	An Ark which travels from city to city to discuss ten ambiguous sustainable commandments.	
2. Cow & Co	A speculative design about a cow who owns and sells her own milk.	
3. People of Petrotopia	A set of dystopic images and spoken narratives about what will happen if we fail to mitigate climate change.	
4. City of Sounds and Silence	A radio play in which you can navigate through the city of the future without seeing anything.	
5. Sensorial Time Travel	An immersive experience to make you aware of the smells of the future.	
6. Letters from 2050	A set of personal letters describing daily life and big systematic changes in the world of the future.	
7. Museum of the Fossil Era	A reflection on the absurdity of the present, including backcasts, a newspaper and a museum.	
8. African Alternatives	Three visual scenario's for African urbanization: base, smart and wise.	
9. Photovoltaic Pergolas	A proposal to apply renewable energy technology in a flexible and visually appealing way.	
10. Platform Cities	A movie depicting two scenario's for shared mobility: convenient without privacy or less efficient, but with privacy.	

future expectations are fictional, or at least speculative. It is important to note that by referring to the way in which an abstract phenomenon like the future is made present, we do not intend to analyze the likelihood of a fictional expectation coming true. Instead, the notion of imaginative logics helps to perceive the different ways in which choices and imaginative leaps are made in the process of presenting and materializing an abstract phenomenon.

An imaginative logic could in principle be understood as the underlying dynamic of the production of any representation of the future or fictional expectation, including mainstream forms such as cost-benefit analysis and backcasting (e.g. Beckert & Bronk, 2018). These more mainstream forms of fictional expectations are commonly seen as potential contributors to collective intelligence; they provide a rational underpinning for decision making. Could a similar argument be made for imaginative interventions? Whereas the Post-Fossil City Contest had started out from a particular idea as to what kind of imaginary might be helpful (a positive, embodied imagination, able to expose the absurdities of carbon addiction while aware of the complexities of city life), this assumption was questioned more and more often as the diversity of submissions became apparent (see Section 2).

On the basis of both the Post-Fossil City Contest and a reading of the experiential futures and speculative design literature, we introduce a tentative typology of imaginative logics and, with that, of the various ways in which an imagination might make an abstract phenomenon like 'the future' present to its audience. Below, we distinguish between familiar, juxtaposing, defamiliarizing, guerilla and procedural logics. These imaginative logics are Weberian ideal types (Shils & Finch, 1997); they shed light on specific

Fig. 3. Images of the Post-Fossil City Contest. Clockwise: curatorial session, build up, milk tasting during the opening, public performance, visitors reading letters from 2050.

characteristics of futuring interventions, rather than describing the intervention in its full complexity. As a consequence, several imaginative logics may be distinguished within one futuring intervention. The typology presented here focuses on the imaginative logics present in art- and design-based interventions, as found both in the submissions of the Post-Fossil City Contest and in existing literature (see Table 2 and Fig. 4). For the development of the typology of these five imaginative logics the multidisciplinary nature of the Post-Fossil City Contest (including contributions from art, design, urban planning, theatre etc.) combined with the strict regulation of the contest (a fixed exhibition grid, a thematic constraint to post-fossil cities) proved crucial because it allowed a precise comparison. Since all ten finalists operated within the same context, we had the opportunity to analyze the different ways in which they rendered the future tangible and develop a perceptual bridge with the audience.

3.1. The doable logic

The doable logic intends to engender optimism and potentially collective action. It does not necessarily have to be feasible in practice yet, but it does provide its audience with a perspective of direction and a potential course of action. Within the Post-Fossil City Contest this logic is most clearly illustrated in the intervention *Photovoltaic Pergolas.* Through a maquette and various renderings the project shows how renewable energy can be applied in the city in a way that is both feasible and aesthetically appealing. Or as the news website of a large real estate company states about the submission, the pergolas are: 'essentially small, solar absorbing panels that can be placed atop any public space throughout a city, providing solar powered streetlights and other forms of sustainable energy. Adaptation and mitigation, at its finest'[3]. Whereas this highly pragmatic submission was not necessarily innovative in an artistic sense, it proved very popular among policy makers. This was intended by the makers, as one of the team members explains:

> I was hoping to influence people who actually can change something in our cities. For instance, policy makers of municipalities who might have influence on the budgets for this kind of pilot projects. (interview)

Photovoltaic Pergolas makes explicit what is possible, just like Norman Bel Geddes did in a more profound way with his GM-sponsored *Futurama* pavilion at the 1939 world fair, where he showed Americans how the car and its concomitant infrastructure were instrumental for a comfortable suburban lifestyle (Rydell, 1993). In a more recent example, Hajer and Pelzer (2018) describe the project *2050 - An Energetic Odyssey*, an interactive floor projection of the North Sea that featured a movie of how renewable energy (in particular 25,000 wind turbines) could materialize there in 2050. The mostly elite audience (CEO's, high level civil servants) that experienced this intervention was enthused by this perspective and felt 'we can do this, we are ready' (Hajer & Pelzer, 2018, p. 226).

However, the doable logic can also be observed in interventions with a less clearly defined course of action. *The Museum of the Fossil Era* shows the things that by 2039 will have become absurd, like the fossil-fuel based port of Amsterdam or eating beef. The idea of the intervention is to show that the energy transition is not as difficult and complex as people often conceive it, but very well

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[3] https://blueprint.cbre.com/how-cities-are-counteracting-climate-change-one-heat-wave-at-a-time/, Accessed 21 September 2018.

Table 2
Typology of the five imaginative logics.

Logic	Image of the future	Intended audience (re)action	Pitfall of logic	Typical form	Example from Post-Fossil City Contest	Example from literature
Doable	Closed (one proposal)	Feel connected to a (common) goal.	Can close of valuable alternatives.	Clear direction and a relatively closed narrative.	Photovoltaic Pergolas; The Ark of the Newest Covenant (see below); The Museum of the Fossil Era, African Alternatives (the Wise City scenario)	2050 – An Energetic Odyssey (Hajer & Pelzer, 2018)
Juxtaposing	Closed (usually up to four alternatives)	Learning about trade-offs and dilemmas.	Selecting the right alternatives is complex and delicate.	Gear attention to dilemma's and trade-offs through extreme scenarios.	Platform Cities; African Alternatives	Hawaii 2050, (Candy, 2010).
Defamiliarizing	Relatively open	Relate to a new, or insufficiently considered issue.	Difficult to connect to solutions.	Use a familiar place, situation or practice and introduce new, or insufficiently considered issue.	People of Petrotopia; Photovoltaic Pergolas (unused city centre rendering)	High Waterline (Nadir, 2015)
Guerilla	Relatively open	Feel confused, even shocked.	Ambiguous nature makes it harder to get a message across.	Use recontextualization to surprise, merge fact and value.	Cow & Co.; Sensorial Timetravel	Audio Tooth Implant (Auger, 2013)
Procedural	Open	Set the own imagination to work.	Time and cost intensive, difficult with large groups.	Develop the generative conditions under which people can imagine.	The Ark of the Newest Covenant; City of Sounds and Silence; Letters from 2050	Sustainability in an Imaginary World (Bendor et al., 2015, 2017)

Fig. 4. Examples of four imaginative logics from the Post-Fossil City Contest: Photovoltoaic Pergolas (doable imagination), African Alternatives (juxtaposing), People of Petrotopia (defamiliarizing) and the Ark of the Newest Covenant (procedural).

possible. To make this point and put the current transition in perspective, the museum also includes a timeline of past 'transformations' (e.g. the industrial revolution), which puts the current transition into perspective: humanity has been through earlier transitions and can make this change as well.

A third example of a doable logic can be found in the very strict 'reading protocol' (Raven & Elahi, 2015) of the *Ark of the Newest Covenant*. The Ark consists of ten highly philosophical sustainable commandments (more on this when we discuss the procedural logic in section 3.5) intended to travel from city to city. For this journey there are strict rules: for instance, the name of each receiving city is engraved in the Ark, and each receiving city has the responsibility to find a new place to receive the Ark. Despite its very philosophical and elusive message, it had a level of concreteness to it. As a journalist from CityLab reports: 'No wonder it won- it was probably the most achievable thing in the Post-Fossil lineup'[4]. The ark presented no clear idea of *where* to go, but it provided very clear instructions on *what to do* to get to this yet unknown future.

3.2. The juxtaposing logic

The juxtaposing logic presents audiences with two or more alternative constructions of the future, allowing them to compare these alternatives. Such an approach has been well-rehearsed in the field of scenario building, where scenarios function as 'learning machines' (Berkhout et al., 2002). Most of the common scenario practice relies on written text and sometimes imagery to represent possible futures. While this might be an apt approach in some – particularly expert-led – situations, more experiential scenarios are critical to foster a deeper engagement from people with different backgrounds. A case in point are the four scenarios that the Hawaii Research Center for Futures Studies developed in 2006, for the project *Hawaii 2050*. As Candy (2010, p.96 – emphasis in original) explains:

> Participants would not simply be handed a text about how things could unfold between 2006 and 2050: rather, they would be invited to *live* it. Each room was designed and staged, with the help of a number of graphic designers, two improvisational theatre troupes, and a dedicated group of volunteers associated with HRCFS, to afford those in attendance (up to 150 participants at a time, per room) a half-hour experience of a different version of Hawaii's future.

Two interventions in the Post-Fossil City Contest also deployed a juxtaposing logic, albeit not as experiential as the work in Hawaii. *Platform Cities* is a short movie that provides the visitor with two possible futures, played out in London and Berlin, respectively. The first scenario depicts London, which has chosen efficiency at the expense of privacy; city life is governed to a large extent by online platforms comparable to the Uber-platform. The second scenario depicts Berlin, which has made the opposite choice; citizens keep their privacy and, as a consequence, profit less from technological developments. The maker uses characters to make the

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stories more personal and an explicit comparision to voice a critique on the existing situation:

> I wanted to open the discussion to a wider audience about what platforms could be. To show that it could be more than Uber and Airbnb, but it could actually also be community driven effort or a community driven infrastructure. I wanted to let the general audience feel that they have a stake that people could connect to. (interview)

African Alternatives starts from a similar perspective. Its makers were frustrated by both the fossil-dependent growth pat that African cities are currently pursuing and the limitations of the much-discussed smart city alternative in addressing social challenges. As one of them states:

> I wanted to use an international platform to draw attention to the extreme challenges faced by African cities (in the hope that global expertise and resources might be better directed to overcoming them instead of focusing efforts on cities that are well developed already). I also wanted to show how much room there is for creativity and innovation in how we think about African cities of the future, and how they could potentially inspire the world. (interview)

This submission uses three equally detailed renderings to depict various scenarios for the African city of the future. The current, carbon dependent situation is contrasted with two possible futures: a 'Smart City' with high-tech and militarized public space, and a 'Wise City' that is rich in post-fossil technology but also livable. The current situation was depicted on a curtain, which had to be removed to see the wise and smart scenario. The presentation of a clear choice between two futures, and their associated consequences, proved highly attractive to lay visitors, many of whom appointed this idea as the winner when asked. Moreover, the image of the Wise City was featured on the cover of a new report of the International Resource Panel (Swilling et al., 2018), and thus found its way to an international policy audience.

It is important to note that critical normative choices are made when selecting which images are to be juxtaposed and presented as possible futures. In the Post-Fossil City Contest, both *African Alternatives* and *Platform Cities* portrayed one of the shown scenarios as more desirable (respectively the wise city and the community driven scenario). Here, the juxtaposition not only aims to show different futures, but also criticizes an undesirable future state.

3.3. The defamiliarizing logic

The defamiliarizing logic uses a well-known place, setting or object, to which a surprising or novel perspective or element is introduced (cf. Bell, Blythe, & Sengers, 2005). The familiarity of the setting allows for an emotional connection with the audience, a mechanism which is frequently used in dystopian movies (e.g. The Day After Tomorrow). A futuring intervention which uses the same technique is, for instance, the HighWaterLine, a chalk line demarcating which areas will be flooded in case of climate change fueled superstorms (Nadir, 2015). Drawing this visual demarcation in a well-known environment brings possible, in this case undesirable, futures quite literally close to home.

In the Post-Fossil City Contest, *People of Petrotopia* sketches an explicitly dystopian vision of a flooded Utrecht, the Netherlands; a city which has ran out of fossil fuels and failed to make the transition to renewable energy in time. Within the installation, visitors could listen to narratives of various Petrotopia residents and study images to learn more about the livelihood of these characters. Importantly, all Petrotopia residents were situated in a well-known location in the city of Utrecht. For instance, one of the renderings showed a large shopping mall in the city center (*Hoog Catherijne*). By doing so, the project targets a lay audience:

> We wanted to make something that was also understandable to the general public. (…) We did not think that using an extreme scenario in itself was the right way to reach out to a broad public, it was the visualization that made the difference. Using strong visuals, a combination of *elements we already know* and putting them into an extreme, but also repositioning these with humor in a very different future situation. (interview – emphasis added)

Interestingly, the intervention *Photovoltaic Pergolas* (*doable logic*) initially used the same approach of using well-known locations in Utrecht, but then decided against this:

> Initially, we selected a location in Utrecht that is really recognizable to people, so they would say: "Ah this is our street, our square". So we chose the Oude Gracht [the 'Old Canal', situated in the historic city centre], but then we showed it to the Municipality of Utrecht and asked them: "Is it OK to show this image at the exhibition?" They reacted very negatively, because they feared residents would see it and react fiercely. (interview)

The *Photovoltaic Pergolas* team chose to develop renderings for less well-known and less controversial locations and the rendering of the Oude Gracht (see Fig. 5) was not displayed at the exhibition.

Another submission that uses a defamiliarizing logic is *Sensorial Time Travel*, a short, visceral experience based on smell. This installation demonstrates the absurdity of the present by asking visitors to walk through narrow passage consisting of two inflatables that emitted the smells of fossil fuels. Tar was used to create this smell, which symbolizes the fossil city, and more in particular the exhausts of cars. Isolating smell in a public building is a difficult task, but the installation left visitors with a lingering feeling of dirtiness. By isolating, concentrating and exhibiting this smell, the installation defamiliarizes an aspect of everyday city life that we usually take for granted or do not even notice.
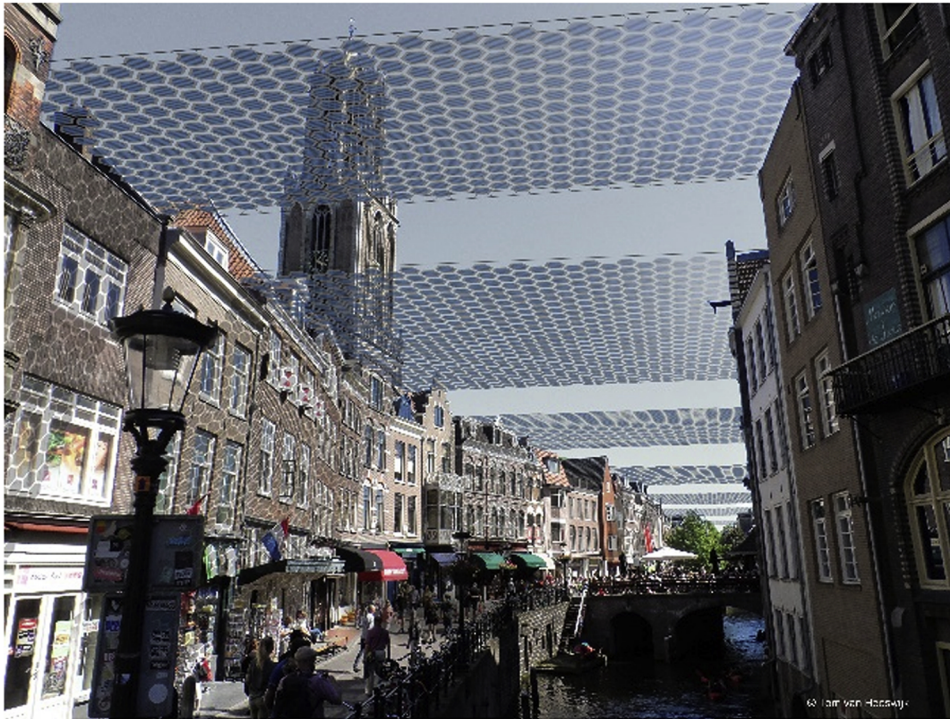
Fig. 5. *Photovoltaic Pergolas* on the Oude Gracht, a well-known location in Utrecht. This rendering was eventually not part of the exhibition.

3.4. The guerilla logic

The guerilla logic depends on the blurring of boundaries between fact and fiction. As a result, it may cause confusion or even a feeling of uncanniness, which is productive because it can spark a discussion. Auger (2013) describes how their idea of an *Audio Tooth Implant* (a communication device in a tooth) was picked up by mass media and seen as an innovative breakthrough. The makers very deliberately mixed fact and fiction into a form of 'verisimilitude' in which 'truths are blurred and disbelief is suspended' (Auger, 2013, p.20). They got several worried reactions from people who perceived their idea as a real product and were worried about the harm it might cause. However, this was not perceived as a problem:

> (…) the core proposal is simple enough for the key message to not get lost in translation. We assumed that due to the extremely large numbers of individuals reached, a percentage would be induced into contemplating a subject they had not consciously considered before (Auger, 2013, p.21).

In the Post-Fossil City Contest, the team of *Cow & Co.* deploys an approach very similar to that of the *Audio Tooth Implant*. *Cow&Co* describes the life of Bertha 85, a cow who owns her milk, wanders freely through the city and uses the methane she emits for producing the milk. Urbanites use an app to locate a cow and buy milk directly from the source. The makers wanted to 'raise awareness about the topic of animal welfare, the usage of methane gas, and the usage of agricultural production or food production' (interview). The team deliberately developed a very detailed system around Bertha 85, discussing animal welfare with veterinary scientists, develop prototypes for much of the required technology and a movie which functioned like a commercial. The absolute centerpiece of this intervention is, however, a picture (see Fig. 6) showing Bertha 85 with a methane balloon and a milking machine. This picture got picked up by a range of media and caused several angry and upset reactions. This was exactly what the makers had intended:

> (…) the picture it looks like as if it is almost true, although you still have the farmer. This created the reactions we wanted to have. Really negative reactions, people being really concerned. (interview)

Fig. 7 is an example of such a reaction, where it is claimed that 'animals should not be used as machines to provide us [with] food'. This assumption was exactly what this project wanted to research. When responding to Cow & Co., people hesitated whether this was a joke or a serious idea, and it was precisely this hesitation that the makers intended.

3.5. The procedural logic

The procedural logic is the most open futuring intervention and depends on a more active involvement of the audience than the logics described above. Rather than suggesting a particular construction of the future, the futuring intervention is intended as a

Fig. 6. The iconic picture of Cow & Co., an example of a guerilla imaginative logic.

Fig. 7. Example of an online reaction to Cow & Co.

bedding in which members of the audience can themselves imagine possible futures.

For instance, the Vancouver based project *Sustainability in an Imaginary World* led the audience through different interactive rooms, where visitors could experience different worldviews. This experiential journey was intended not as a presentation of clear-cut options, but to help emerge deeply held beliefs about sustainability (Bendor et al., 2015, 2017). For the initiators, this was part of what they call a 'procedural approach' to sustainability, which 'foregrounds the view that the nature of sustainability itself is open for discussion and can be expressed in fundamentally different ways' (Bendor et al., 2017, p.17). Or as other authors involved in the same project put it, sustainability is an:

> (…) emergent property of conversations about desired futures that is informed by some understanding of the ecological, social, and economic consequences of different courses of action (…) sustainability is not a scientific principle or set of expert-derived practices that can be bestowed upon publics, but something that must be forged by and through those *publics* as a *space of possibility*; it is itself emergent from such processes. (Maggs & Robinson, 2016, p.184 – emphasis added)

Within the Post-Fossil City Contest, three submissions deploy a procedural logic; *Sun City*, *Letters from 2050* and the *Ark of the newest covenant*. The makers of this Ark adapted their submission to the presumed preference of the jury:

> We knew many people in the jury were interested in this kind of intellectual reflections, if the jury would have consisted of Thai boxers, we would have developed something entirely different.

Perhaps because of this, the team chose to combine different genres (visual, theatrical, religious) to create an object that would be difficult to categorize. The ambiguity of the Ark's meanings – combined with strict and clear instructions regarding its use, see section

3.1 – was intended to allow audiences to perceive their world anew:

> We wanted to make an object that has such high quality it would do something else than things you already know. Something of such high quality can let you think or make you wonder, so you'll become interested as an urbanite. (...) It is an invitation to think, to rethink. To sum up: we combined different forms in order to make an extraordinary object that touches people in order to spark their thinking. (…) Thus we made a design that is so different from what people are used to that one steps out of his or her daily routines and takes time to reflect. I saw people walking by the Ark and standing still, and imagined they would think: "Wow what is this?" (interview)

Whereas the Ark was indeed well received by the jury and policymakers, its illegibility proved to be an obstacle for lay audiences, particularly if they encountered the exhibition incidentally. One might infer from this that the openness of a procedural approach asks a lot from its audience, and therefore requires a particularly careful design of staging, setting and process (cf. Bendor et al., 2015, 2017; cf. Hajer, 2009).

Two other submissions in the Post-Fossil City Contest used a similar, procedural logic. We present these only briefly for reasons of space. The makers of the radio play City of Sounds and Silence chose not to present audiences with visual images, but developed an experience purely for the auditive system, encouraging visitors to use their own imagination:

> We wanted to let people imagine the world of tomorrow, the world of the future themselves. And in such a way that the ideas they have about this, and in particular the images they have [in their mind] are generated by people themselves, rather than that they are imposed by us.' (interview)

The team of Letters from 2050 similarly chose a relatively old-fashioned technique – letter writing – to describe the worlds of various characters. Doing this, they wanted to open up established notions of climate change:

> Because we increasingly think of climate change as an apocalyptic moment that will happen in the future, whereas through letters we were able to discover – using literary techniques – to have more diversity, to see it not as a moment, but as a process. (interview)

Like the Ark, both Letters and City of Sounds and Silence proved successful in guided interactions, but difficult for audiences to spontaneously engage with.

3.6. Comparing imaginative logics

Table 2 depicts the five imaginative logics that we distinguished. This table underlines that mobilizing imagination to engage with societal issues is not a 'one size fits all', but a situated craft. Various imaginative logics intend to elicit different reactions from the audience, but they also come with specific challenges. Perhaps the most important factor to consider is the relative openness in the logic's portrayal of the future. The doable logic connects potentially easily to a wider audience because of its coherent narrative, and its potential to be captured in a simple representation (like a picture) that can travel easily without too much elaboration. The flipside, however, is that the openness of the portrayed future is limited; the audience has little choice, other than buying into the vision or refuting it. In sharp contrast with this, a procedural logic takes a much more deliberative approach: it does not sketch a specific image of the future, but stimulates people to imagine for themselves. In its application, however, it often requires additional guidance or facilitation.

In general, the more open-ended the imaginative intervention is, the harder it will be to communicate about it. It lends itself better for deployment in physical settings with facilitation, but this limits the amount of people it can reach. The projects that were mentioned most often in the media had a strong visual representation, like *Cow & Co.*, *People of Petrotopia* and *Photovoltaic Pergolas*. The top three selected by the jury were mentioned less often in the media, but arguably led to a deeper engagement with the topic at the exhibition; they asked visitors not only to observe, but also to participate and imagine for themselves. With the doable and procedural logic at opposite ends of the spectrum, the defamiliarizing and disorienting logic should arguably be placed somewhere in the middle of the open-closed axis. Whereas they both aim to let their audience rethink or reframe a certain topic, and are in that sense relatively closed, they do not reveal a solution or steer towards a desired course of action.

4. Discussion and concluding remarks

We started this paper with the argument that we do not only need *more* imagination to deal with the great issues of our time, in particular climate change, but also a better understanding of *how* imagination works in relation to sustainable transformation. With this paper, we aim to provide insight into the different approaches through which imagination might render an abstract phenomenon like the future present to an audience. In order to do so, we presented the Post-Fossil City Contest, an international competition that brought together designers, musicians, academics and artists. On the basis of our experiences with the Post-Fossil City Contest, corroborated by a post-hoc study through interviews and secondary data analysis, we developed an ideal typical conception of imaginative logics. Imaginative logics can be defined as *the set of principles underlying or constituting an imaginative intervention, by means of which an abstract phenomenon is made present to the audience.*

To understand the application of these imaginative logics, our experiences with the Post-Fossil City Contest underline Hajer's (2009) argument that the staging of an intervention influences its effect in crucial ways. This means that seemingly organizational issues in the design of a futuring intervention can hugely influence its effectiveness, that is, its capability to reach an intended

audience. The format of an open contest proved crucial in reaching out to the public debate, as evidenced by the fact that the call announcement received significantly more media attention than the exhibition opening or the selection of the winning submission. Whereas the message that imagination had a role to play in envisaging post-fossil futures resonated in the media, the format of an open contest proved less successful in connecting to policy makers. While we organized a range of workshops and guided tours for policy makers, the ten winning futuring interventions – with the possible exception of the doable imaginations – were too far removed from the policy issues these practioners perceived as being important.

Imaginative logics should thus always be understood as staged and their application is highly situational. This is relevant to keep in mind when applying or interpreting the typology of imaginative logics we developed. In this typology, we distinguish five imaginative logics: doable, juxtaposing, defamiliarizing, guerilla and procedural. We don't see this categorization as definite, but rather as an invitation for further and more comparative research into futuring interventions. It is crucial to explore further how immersive futuring can be effective, e.g. by reaching particular audiences or by playing a particular role in the debate, and that an awareness of imaginative logics and their strengths and weaknesses might be helpful. The relative openness in various imaginative logics' portrayals of the future is an important factor to consider. This is particularly relevant when considering courses towards a post-fossil society, because an important dilemma here is that between the necessary acceleration of this transition and the procedural quality of the process, including the recognition of the painful political choices involved. Climate change arguably requires short term action and the doable imaginative logic might help to align stakeholders and interests, but the flipside is that it might close down the consideration of alternative interests and values. The three relatively open logics of defamiliarizing, guerilla and procedural are better equipped to contribute to an open deliberative process, precisely because they might help to bring political aspects to the fore. A nice example of this difference can be seen in the submission of *Photovoltaic Pergolas*, that was ultimately limited to images of relatively anonymous neighborhoods, and did not show the defamiliarizing sight of photovoltaic cells in the historic city center. In this way, contentious reactions were prevented – but such reactions could have resulted in an interesting debate about which trade-offs would, or would not be acceptable.

In conclusion, the concept of imaginative logics provides a language to reflect upon different imagination practices. From an academic perspective, the typology helps to compare the various ways in which an abstract phenomenon like 'the future' is rendered in such a way that it can be experienced by an audience. Moreover, it can be useful as an orienting framework for futurists, designers and other agents of change who are not chiefly concerned with academic analysis, but with the crucial work of mobilizing imagination to create a better future.

Acknowledgements

Appendix A

Table A1
Original journalistic pieces about the Post-Fossil City Contest.

Date	Source	Title	Language	Author
June 23, 2017	NRC Handelsblad	De post-fossiele stad wordt zichtbaar in Utrecht	Dutch	Paul Luttikhuis
September 19, 2017	De Correspondent	Ooit droomden we van auto's en spaceshuttles. Waar brengt onze verbeelding ons nu?	Dutch	Jelmer Mommers
August 25, 2017	CityLab	The Fossil-Fuel-Free Cities of the Future Sure Look Weird	English	John Metcalfe
October 20, 2017	Blueprint (CBRE)	How Cities Are Counteracting Climate Change, One Heat Wave at a Time	English	Emma Kantrowitz

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