



Original research article

## Blue skies in the making: Air quality action plans and urban imaginaries in London, Hong Kong, and San Francisco

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## ABSTRACT

Air quality action plans (AQAPs) are emerging as a promising governance tool that cities employ in pursuit of clean air transitions. Representing a city's blueprint for achieving a particular air quality objective, these plans both describe a particular vision of what a blue sky urban future should look like and provide the mechanism by which the city aims to achieve this vision. As such, AQAPs constitute an important shift from a highly fragmented and instrumental environmental policy towards an integrated strategy guided by a long-term vision. This article unpacks the visionary fabric undergirding AQAPs as well as their media representations by means of content analysis. Using three concrete case studies—London, Hong Kong, and San Francisco—the analysis is guided by Jasanoff and Kim's concept of sociotechnical imaginaries. The concept states that societies hold collective visions about desirable futures that are institutionally stabilized and publicly performed, ultimately coming to shape policy agendas and developmental trajectories. The application of this concept to AQAPs contributes in two ways. First, it addresses questions about the similarity and fragmentation of environmental policy in the global arena. By providing evidence for the similarity of imaginary structures between cities, it supports observations of a striking uniformity in governance patterns of environmental policy. Second, the article discusses what sociotechnical implications AQAPs may have for the city. It does so by elaborating on five storylines driving imaginaries of urban futures and pointing out the possibilities and limitations they delimit: 1. the government-up-front, 2. the new economy of clean air, 3. the technological fix, 4. remaking the 'good' urban citizen, and 5. the science-policy interplay.

### 1. Introduction

Since the adoption of the first environmental policy plan in Denmark in 1988, environmental plans have made a global career as governance tools of sustainability transitions.<sup>1</sup> Today, more than 160 countries have formulated a national environmental strategy [2]. As the authority of nation states is increasingly being shared with non-state actors [3]<sup>2</sup> and national standards are often perceived as insufficient to meet both local and global environmental demands [4], environmental planning has gathered steam at the sub-national level. Cities are foremost in this new geography [5]. This comes as no surprise: not only do cities concentrate present and future consumption and production, and are hence the origins of "unsustainability" symptoms, they simultaneously are critical arenas in which concrete solutions can be envisaged, designed, and effectively performed [1]. Examples of

sustainability solutions from cities are manifold and range from zero waste initiatives over the "Internet of Things" to retrofitting buildings for energy efficiency.

One problem sphere in which urban environmental planning is increasingly finding application is air pollution. Causing the death of more than 5.5 million urban dwellers every year, poor urban air is the leading environmental cause of death worldwide [6]. Besides, it has shown to affect plant and animal health, property, visibility, and climate change [7]. While some cities have made substantial advances in air pollution control, most major cities, especially those in Asia, still suffer dirty air [8]. What is more, current global climate change looms to worsen urban air quality through a mix of higher temperatures, increased biogenic emissions, and atmospheric stagnation [9]. As air pollution continues to threaten public health, cities have started to adopt air quality action plans (AQAPs) in pursuit of clean air transitions

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<sup>1</sup> Following Nevens et al. [1] "transitions" in this paper are defined as long-term processes guided by visions of desirable sustainable systems configurations.

<sup>2</sup> The term "non-state actors", as used in this sense, does not imply that these actors are necessarily non-governmental, but that they operate at different vertical levels of government, e.g. the sub-state or transnational level.

[10]. These plans are a city's blueprint for achieving and maintaining a particular air quality objective. They not only describe a particular vision of what a blue sky urban future should look like but also provide the mechanism by which local authorities state their intentions for working towards this vision through the use of their available powers [11].

Air quality action plans represent an important shift from the ways traditional environmental policy has been done for the most part. Since the onset of environmental concern in the 1960s, environmental policy has mostly been a sectorally fragmented, largely instrumental, and legally based regulatory endeavor [12]. Clean air planning, in contrast, is based a multiplicity of voluntary, collaborative, and market-based regulatory instruments which aim to evoke different partners to re-engineer the built environment, apply science and technology, re-configure markets, or change user practices [7]. As such, AQAPs are more of an integrated strategy guided by a long-term vision [13]. It is important to clarify that AQAPs are not finished policies. Typically, they are less politically accountable, not legally binding, and lack the teeth to enforce action [14]. As a new form of policy making the effectiveness of these plans remains untested. However, they seem to be a promising way of envisioning and enacting a sustainable future.

As the new field of urban air quality planning emerges, AQAPs can act as black boxes concealing within them contestations of power and meaning. Different cities may have competing visions for the future of clean air and therefore employ different strategies to achieve these visions. This article aims to open the lid on these black boxes by unpacking the visionary fabric that undergirds AQAPs. It does so by providing a content analysis of the AQAPs of three global cities—Greater London, Hong Kong, and the San Francisco Bay Area—as well as the national media representations of these plans. This textual analysis is informed by Jasanoff & Kim's [15] concept of sociotechnical imaginaries. Rooted in the intellectual tradition of Science and Technology Studies (STS), it captures the idea that societies hold collective visions about desirable futures and that these visions are institutionally stabilized and publicly performed. The term itself is hybrid, straddling the humanities (*imaginaries*), social sciences (*socio*), and science and technology (*technical*). As such, it is a suitable analytical envelope within which to address questions about the complexity of clean air transitions in urban spaces.

By exposing the sociotechnical imaginaries ingrained in the AQAPs of different cities, the article contributes to two debates. First, from a comparative standpoint, it speaks to controversies about the similarity and fragmentation of environmental policy in the global arena. While some observe local particularities and cross-culture variations in environmental policy [16–18], others see a general trend of increasing similarity in environmental politics [14,19]. Second, the article addresses questions about the wider non-air quality impacts, i.e. sociotechnical implications, of AQAPs as well as the possibilities and limitations they delimit [11]. Imagining possible futures creates opportunities for the present and helps to mobilize resources for certain spaces of action [22]. As imaginaries have the potential to do political work, they get to shape the material world. In this sense, this study demonstrates the importance of clean air imaginaries when it comes to understanding change in the urban sphere.

In engaging with these debates, this article makes two arguments. First, it claims that the AQAPs of different cities exhibit similar imaginary structures. This is evidence of a striking uniformity in environmental policy and the global ethics of urban air pollution planning. Second, it shows the ways in which imaginaries of clean air futures may structure change in the urban sphere. These changes will manifest in five domains: municipal governance, technological systems, urban economics, good citizenship, and the role of scientific expertise. As they seek to change the sociotechnical fabric of the city, these imaginaries delimit certain possibilities and limitations for urbanity at large. By discussing these possibilities and limitations in the context of relevant literature, the article aims to empower communities to critically

examine and re-calibrate visions of blue sky futures and interfere with the social impacts and materializations they prefigure. It is important to note that we are not suggesting that AQAPs, in general, or the three on which we focus, in particular, are necessarily “preferable” or more “effective” forms of environmental governance. Indeed, what constituted “effectiveness” is a matter open to debate and is contingent on the imaginaries within these plans.

The article is structured as follows: Section 2 introduces the concept of sociotechnical imaginaries. Section 3 describes the choice of studied cities and sources as well as the analytical method. Section 4 outlines the finding of similarity and presents five storylines driving sociotechnical imaginaries of air quality action plans. Moreover, it discusses the potential sociotechnical implications of these imaginaries, as well as their limitations and possibilities by placing them in the context of relevant literature. Section 5 provides an overall discussion of the findings and contains a concluding outlook on further research.

## 2. Imaginaries of urban futures

The importance of future imaginations as reservoirs for present-day change has securely been recognized in interpretive social theory and related concepts spawn across several disciplines. Besides “fantasies” [23], there are “visions” [24], “promises” [25], “anticipation” [26], “expectations” [27], “foresight” [28] and “imaginaries” [21]. While each of these terms is unique in its own right, they all in some way refer to collective beliefs about how society functions. Yet, they do little to link that notion to the action and performance involved in modernity's opulent aspirations with science and technology [21]. As clean air transformations herald substantial changes to the urban built environment, coming to grips with the material dimensions of imaginaries is a central task for environmental planners and policy makers. Therefore, this research relies on the sociology of sociotechnical imaginaries [15]. Inspired by Marcus' [29] concept of technoscientific imaginaries, Jasanoff and Kim define sociotechnical imaginaries as: “collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order, attainable through, and supportive of, advances in science and technology” [15, p. 12].

The term itself is hybrid, as captured by the duality of the adjective “sociotechnical.” For one, it describes imaginaries as idealistic and collective mental constructs. Imaginaries are an “organized field of social practice” [17, p. 14]. As instruments of meaning- and sense-making, imaginaries can shape public understandings of citizenship, equity, or scientific reason [21], and thereby serve as a key component in the making of social order. At the same time, imaginaries get to shape the material world through their repeated reproduction, enactment and performance in society [22]. It is this performative capacity that makes sociotechnical imaginaries a promising analytical tool to address the coalescence of collective imaginations with scientific and technological production. Sociotechnical imaginaries are hence key sites for the co-production of science, technology, and society [15]. Relatedly, STS scholars have used the concept to explain how certain future visions look like [30], why some imaginaries are more durable than others [17], what their sociotechnical implications may be [20], and how these variations can be explained by the variables of time, space, and culture [21].

While many studies thus far have investigated the workings of sociotechnical imaginaries at the level of nation states [17,22,30,31], they can also be articulated and propagated in more local places, for example, corporations, social movements, or professional societies [16]. Nevertheless, the evolution, uptake, and dissemination of imaginaries in urban spaces remain understudied. This absence is all the more perplexing because cities are gaining importance as centers for innovation in governance, technology, as well as social and environmental change [5]. While being greatly affected by global challenges, such as migration, terrorism, or global warming, cities have shown to

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