Doughnut Economics within urban climate action: a comparative study between Amsterdam, Copenhagen and Stockholm

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Abstract

In this thesis we examine the influence of Doughnut Economics thinking on urban climate action. By comparing the urban visions and climate action plans of the Doughnut-following city of Amsterdam and the cities of Copenhagen and Stockholm, we try to investigate whether following a Doughnut approach leads to different climate action than currently can be found within the traditional growth-based economic paradigm.

Through a qualitative text analysis, we first test the urban visions of the three cities, represented within their city plans, with compliance to the Doughnut framework. Next, we test the climate action plans against a set of criteria, based on the sustainable urban transformation framework by McCormick et al. (2013) and societal requirements for governance. Consequently do we compare the visions and climate plans with each other before discussing the main differences.

We find that following a Doughnut Economics approach leads to a more complex understanding of climate-related urban governance, which gets reflected in the Doughnut understanding of traditional capitalist cities. On the other hand are the climate targets very similar, but the Amsterdam plan is too young to conclude anything about its execution. Furthermore do the cities of Copenhagen and Stockholm base their climate action on economic growth and rational behaviour, whilst the city of Amsterdam values the importance of urgent and responsible climate action, implying a more solidified base for complex urban governance.

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1. Introduction

Cities are playing an increasingly important role worldwide. By 2030, 60 percent of the Earth's population is expected to live in an urban environment (U.N. Department of Economic and Social Affairs, 2020). To many this might not sound new. Just as the fact that these cities are "responsible for 75 percent of global CO2 emissions" and that it is "essential [therefore] to make cities an integral part of the solution in fighting climate change" (U.N. Environment Programme, 2017). Many urban regions have acknowledged this issue and have started to develop actions and guidelines towards a more sustainable future. These plans focus on themes such as 'energy transition' and 'water management' (Stad Brussel, 2022) over 'conservation and expansion of green areas' and 'climate robustness' (Oslo Kommune, 2020) to 'public participation' and 'growth within limits' (Gemeente Amsterdam, 2021a). If one would look further than Western Europe, topics such as local jobs (Municipal Corporation of Greater Mumbai, 2022), the treatment of waste (City of Buenos Aires, 2020) and green economic growth (The City of New York, 2023) are also the centre of attention. Yet most climate plans still focus on status quo actions, posing great believe in future technical solutions (Heikkinen et al., 2018 in Hurlimann et al., 2021; Tonks & Lockie, 2020). This can be due to a variety of reasons, as climate planning and urban development in general is complex matter with many different influences. So do cities have to incorporate demands for topics as social justice, carbon reduction and economic goals (Pineo, 2022; Prall et al., 2023 p.2).

The latter subject is important for policy makers worldwide, as economic growth is the key factor for political stability in the current global paradigm of economics. Whilst the definition of sustainability can be argued about, especially depending on the worldviews and contexts of different cultures, there is little doubt about the base of our society: "economic growth is the most effective way to pull people out of poverty and deliver on their wider objectives for a better life" (DFID, 2008 p.2). However, the last few years have seen the rise of alternatives for organising our economy and reshaping the definition of a good life. Methods such as the Sustainable Development Index (Hickel, 2020), the global footprint (Global Footprint Network, n.d.) or the post-growth based Doughnut Economics (Raworth, 2017) try to challenge the way traditional societal views look at sustainability, climate change, and how to cope with them.

These different frameworks are developing themselves at the same time as climate action plans are. Especially Doughnut Economics has reached a position in the international debate and can be considered as a publicly known economic alternative. This position is represented in the foundation of the Doughnut Economics Action Lab (DEAL), a global movement that tries to help people, societies and governments to promote, understand and create Doughnut Economics (DEAL, n.d.-a). And it is not just in economic debates and movements that the Doughnut can be found. The city of Amsterdam has officially adopted the idea of the Doughnut as their official (economic) framework. For this reason the DEAL has worked out a tailor-made version for the Dutch capital, which is a key part of the city's urban transition towards sustainability (Amsterdam, n.d.; DEAL et al., 2020).

McCormick et al. (2013 p.35) state that "around the world cities have very different starting points and conditions for sustainable development or the green economy". But in what sense does a different economic approach lead to climate action differences? This question is important because in general there are very few evaluations of urban climate action plans, their effectiveness and efficacy and "the extent to which urban planning policy documents address climate change adaptation and or mitigation" (Hurlimann et al., 2021; Seto et al., 2014 p.977). This creates a "lack of scientific understanding of how cities can prioritize climate change mitigation strategies, local actions, investments, and policy responses that are locally relevant" (Seto et al., 2014 p.976-977). This is even more valid when new economic approaches are coming into play, yet a major issue considering the severity of climate change, which nowadays is also often described as "climate crisis" (Ripple et al., 2020; The Guardian, 2019). This severity is calling for quick and urgent climate action responses and strategies, where governmental instances can learn from each other. This also includes comparison between the different approaches behind these strategies.

This is especially the case because climate action plans do not stand on their own, but are rather linked with urban strategic visions, which "conceptualise mid-to-long-term development scenarios" (Marom, 2019) and can be defined as "desirable future states" (John et al., 2015 p.89). As urban visions show the preferred future of a city, they are undeniably linked with their view on society and therefore the economy. It is through these visions that economic paradigms can influence climate actions plans. Therefore, this research wants to investigate whether a Doughnut Economics approach makes a difference towards climate action. By comparing the Doughnut Economics led city of Amsterdam's future vision and

climate action plans with those of the traditionally economic growth based cities of Copenhagen and Stockholm, we are trying to answer following research question:

How does following a Doughnut Economics approach affect urban climate action plans?

- Does this approach cause different urban visions?
- Is this different vision translated into climate action plans?

More visually, this thesis follows the pathway of influence of an economic approach on policy outcomes and compares whether this leads to different results on the vision and climate action plan. *(Figure 1)* As the traditional capitalist approach is the dominant force within the Western World, will our analysis mainly focus on the possible differences caused by following a Doughnut Economic Approach.

We will start off with discussing the scientific relevance of our research, followed by the presentation of our theoretical framework, including both economic and urban components. In our research methodology we will discuss the methods used for the analysis, which is performed after the clarification of the choice of the different cities and their institutional setting. In the analysis we will discuss the similarities and differences of the urban visions and climate action plans separately, after which we will bring them together and answer our research question in the discussion using both economic approaches as well as taking into account other possible explanations. Lastly the conclusion will summarise our findings.

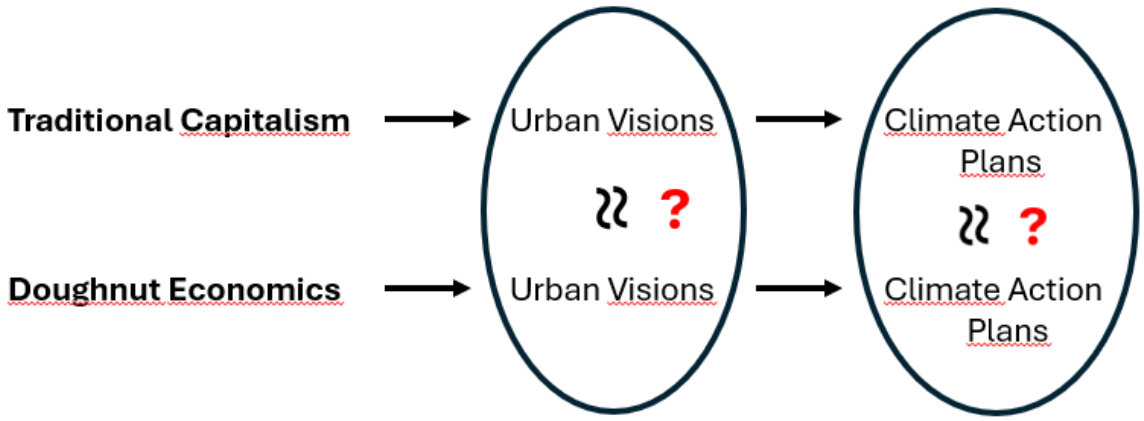

Figure 1: Visualisation of the research question

2. Scientific Relevance

Cities “can be planned to be more environmentally sustainable than rural or suburban living” (Addanki & Venkataraman, 2017). However, Heidrich et al. (2016 p.37) add that “how and why cities engage in climate policy remains largely unclear and the effect of (binding or non-binding) policies from higher levels of government is hardly understood. This is showing the importance of cities within the fight against climate change. They also state that “it is assumed that adaptation has to be, and mostly is, undertaken by local authorities, as this is where impacts are experienced and interdependencies are more easily recognised” Heidrich et al. (2016 p.38). In addition, Hurlimann et al. (2021 p.1) say that well-designed urban planning policy can mitigate greenhouse gas emissions and adapt to anticipated climate change impacts. This does not mean cities have complete free decision-right over their climate action decisions, as they are still subject to national and possible supranational legislation. So does the European Green Deal state that there can be “no net emissions of greenhouse gasses by 2050” (European Commission, 2021), obligating member states to implement action plans, which trickles down to the local urban level. These supranational and national climate are translated at the local level. Sometimes they even get improved, in case initiatives are deemed insufficient on the implementation level (Seto et al., 2014 p.969).

However, empirical research focus has been limited to a singular focus on mitigation, adaptation or emission reduction plan, neither looking at a combination of these elements, neither at a comparative level between plans (Eisenack & Roggero, 2022). Such a systems approach is required in real climate planning, as greenhouse gas emission drivers originate in various factors, and city planning in general is considered more and more interdisciplinary, therefore requiring an eye for different approaches and origins (Seto et al., 2014). Lately, programmes like the EU-project NetZeroCities or the C40 Knowledge Hub have been set up in order to bring cities together and facilitate intercommunal learning (C40 Knowledge Hub, n.d.; Liakou et al., 2022), thereby setting up transnational municipal networks (Eisenack & Roggero, 2022). But in reality the focus on urban climate policies still located on the local urban level. Therefore there is a knowledge gap on the comparison of urban climate plans.

Furthermore is city planning in general considered more and more interdisciplinary, therefore requiring an eye for different approaches and origins (Pineo, 2022). This is especially the case as there is a big knowledge gap in the functioning of governance models and regimes within climate action (Lwasa, S. et al., 2022 p.925). In this paper we will focus on economic approaches within cities, and more detailed into how these approaches influence city planning challenges related to climate change. Lastly (and maybe most importantly) is climate change action an urgent matter, especially given the rapidly increasingly pace humanity is getting confronted with its consequences. Therefore climate action needs to be implemented faster and with less room for failure, even more if humanity wants to stay underneath the 1.5 degree goal set in the Paris 2015 Agreement. Therefore it is important to investigate the effect of different economic approaches on climate action.

3. Theoretical Framework

Green urban planning ideas have always been a part of urban studies. Thomson & Newman (2021) give an overview of two contrasting approaches. On one hand, ecological cities are designed in a way to give as much space as possible to nature, trying to recover natural conditions. This leads to spread-out urban areas with a big areal footprint, but many green areas within the fabric. Examples of this approach are the ideas of the garden city, and more recently the low density city approach by Frank Lloyd Wright (Russo & Cirella, 2020; Thomson & Newman, 2021). On the other hand do Thomson & Newman (2021) describe the density planning approach of the resource efficient city, where the ecological footprint is kept as small as possible by reducing the areal use and integrating processes for the daily organisation (such as energy, water and urban waste). Whilst this approach tries to entail a more fair distribution of access towards urban jobs and services, it is also contrasting the idea of ecological cities: by limiting the spatial use does the resource efficient city not include green in the city, leaving a dense but non-permeable inside the city's boundaries and trying to limit the human impact outside of it. Furthermore are the benefits of a compact urban form to be balanced against the costs required to achieve them (Leibowicz, 2020 p.605). Andersson et al. (2014 p.450) refute this contrast by stating that "cities hold unexplored potential for new urban spatial designs that integrate ecosystem services in the built environment, for restoring degraded ecosystem functions through complementary designs of land uses and urban green

structures." An example is the densification and mixed-use of neighbourhoods through urban regeneration (Lwasa, S. et al., 2022). Seto et al. (2014 p.951) add that "urban density is thus a necessary – but not sufficient – condition for low-carbon cities." This is leaving an opening for an approach in between that of the ecological and the resource efficient city.

3.1. Urban Visions

Which approach a city is using can be seen in visions documents. Within urban policy they are the most abstract type of urban policy documents out of which strategic plans, regulations and local plans originate. The concept originates from business management practices, where the use of goals and visions is a common tool (Marom, 2019). On a more abstract level are visions part of a discourse (or story telling), which "create[s] meanings and normalize[s] certain behaviours or approaches" (Sattler, 2022 p.277). In the context of urban planning, discourses are known as urban narratives and can be seen as "a model for the way planning could or should be done" (van Hulst, 2023 as cited in Sattler, 2022 p.281). Furthermore are they used as a communication strategy in sustainable planning efforts and can an engagement with narratives bring forward new understandings of urbanity (Sattler, 2022 p.293-295).

More practically do visions provide a projection of the desired spatial design and principles in the future, also known as urban futures thinking. In an overview of academic literature on urban visions do Dixon and Tewdwr-Jones (2021 p.1) describe how this "offers us the opportunity to imagine what cities and urban areas will be like in the long term, how they will operate, what infrastructure and governance systems will underpin and coordinate them, and how they can be best shaped and influenced by their primary stakeholders." More concrete do they state that city visioning comes into play when thinking "explicitly about the long-term future of our cities" (Dixon and Tewdwr-Jones, 2021 p.2). They argue that this is especially true given the "the disconnection between relatively short-term planning horizons of 5–10 years and longer-term environmental changes (20 years or more)" and that it therefore "is vital for cities to develop specific longer-term "visions" that open up a possibility space to explore multiple futures and also provide a roadmap of how to achieve a shared and desirable future" (Dixon and Tewdwr-Jones, 2021 p.3). This argumentation is strengthened by (Marom, 2019), who states that urban plans from planning institutions have such "important consequences for the processes of urban development and transformation" that they "have powerful effects in shaping urban hierarchies and spaces."

The dominant frameworks within the planning field can be found within urban visions. Russo & Cirella (2020) give an overview of the history of sustainability planning and how it the dominant views are still being reflected in modern day cities. So is the modernist city by Le Corbusier still influential worldwide and have Eastern Asian cities like Shanghai and Singapore attempted to create sustainable neighbourhoods. In order to achieve the creation of such a sustainable area, there is a need for a societal and urban transformation, which cannot be performed without future urban visions (Addanki & Venkataraman, 2017, p.6). These visions are developing all over the world, but can differ from another, which complicates a comparative approach. Istenič & Zrnić (2022) analyse the differences between climate visions in Croatian and Slovenian cities, basing themselves on Smiths (2006) "authorised discourse of urban policy": "the manner of writing visions, a vision as a collection of content knowledge, and visions as a procedure for appropriate communication and use of knowledge" (Istenič & Zrnić, 2022 p.2).

In practice there is a difference between the concept of urban visions and the way they are established. Whilst they are to be considered as a declaration of intend, can they exist both as separate documents, as well as an integration of 'city plans', a term which can be used interchangeably with the term 'urban vision' (Bonakdar & Audirac, 2021; Lockwood, 2020). Furthermore are city plans often more tangible and embedded within both planning and urban organisation and legislation and are they a tangible product of the visions present in the city. Therefore can a city plan also function as a translation of a city's vision. Because we want to investigate the influence of a Doughnut Economic approach on climate action, it is important to deal with the tangible outputs produced by the city. Therefore we categorise urban plans as a valid representation of urban visions.

3.2. Economic Visions

Economic growth is a key factor within our society. This is also being reflected in the urban setting, where the approach of economic development "has gained attention, and cities are being highlighted as successful growth engines." This growth is actively promoted by political leadership "to increase [their] attractiveness and competitiveness in the context of sustainable development and the green economy" (McCormick et al., 2013). This green economy can be defined in different ways, which we will describe in the following section. But before we can tackle the definition of green economy do we need to understand the basics of the current economic paradigm.

3.2.1. The traditional economic paradigm

The main driver of our current economy is economic growth. “Economic growth is the most effective way to pull people out of poverty and deliver on their wider objectives for a better life” (DFID, 2008 p.2). This is because economics defines welfare as goods, or at least the possibility to buy goods. The monetary value of welfare is expressed as the Gross Domestic Product (GDP): the total value of all products or services produced in a specific geographic area over a defined period of time, usually one year. So simplified: the total amount of money a geographic area has in their possession. In order to achieve a better life, the total sum of these goods, the GDP, needs to grow over time in order to ensure an increased household income, and therefore increased average living standards (OECD General Secretariat, 2019 p.6). In order to stimulate the growth of the economy, there is a need for inflation. Inflation causes a decrease of value, which urges consumers to spend their money today, which creates extra demand and therefore making the economy grow.

Like other sciences does economics have different paradigms, but most countries can be categorised as capitalist. In a historic overview does the OECD General Secretariat (OECD General Secretariat, 2019) describe that for the majority of the recent history, neoclassical economic theory has been the dominating force, where the free market is supposed to be self-regulating. Besides the focus on economic growth does the theory also assume ‘rational economic behaviour’: every actor, being a business or a person, tries to maximise their utility based on preferences which are determined in advance. By accumulating all these individual interests the market is supposed to reach the optimal societal outcome. This mechanism is also known as ‘the invisible hand’. However does this not always work perfectly, as some products are not perfectly suited for free markets: so-called market imperfections. It is the task of the government to correct these market imperfections by setting up rules or taking the production of these goods upon them (OECD General Secretariat, 2019 p.10). In a more new Keynesian approach, the government is expected to actively interfere (eg. in case of a financial crisis, such as in 2008). In a more neoliberal approach, the government is expected to set out the basic rules of the market and stay away from the rest as much as possible. Examples are the famous reforms by American president Ronald Reagan and British prime minister Margareth Thatcher in the 1980s (Steger & Roy, 2010a, 2010b). As countries can differ from their exact vision within capitalism are we going to refer to ‘traditional capitalism’ as the current economic paradigm.

A) The traditional economic vision and climate change

One of these market imperfections to be regulated by governments are externalities, which can be both positive and negative. So is the contaminating effect of a pollutant often not reflected into the price; the price of a plane ticket does not entail the societal costs of the disturbance caused by that flight. Besides the direct warming effect of the GHG, does it for example also cause increased noise exposure to the airports neighbours, with proven long term physical and psychological effects. This extra uncovered cost is called the externality or spill-over effect. The sum of the product cost and the externality is called the social cost, as it is the total cost imposed on the society (Devlin & Grafton, 1998). On the positive side can the implementation of green infrastructure (GI) in the city not only help in dealing with climate effects such as heat island effects and floodings, but does it also provide social (a park as a place for recreation and social relations) and economic benefits, such as increased cooling efficiency and thus electricity costs for cooling (Lwasa, S. et al., 2022 p.876, Seto et al., 2014 p.975-977; Sturiale & Scuderi, 2019 p.89; 94). The traditional economic view tries to calculate these effects in different ways. The willingness to pay investigates how much an individual would be willing to pay in order to decrease the level of hinder by one unit. The financial values method tries to look at financial records, such as the difference in housing prices between a town close to and far away from the airport (Ruff, Larry, 1993).

These principles can be applied to the issue of climate change. For the traditional capitalist paradigm the aim is not to not to reach a maximum of pollution reduction, but to find the ‘acceptable level of pollution’. Because welfare is defined by GDP, is the situation with the most utility created the most economic efficient output. This situation is envisioned in *Figure 2*. The first equilibrium is showing the regular situation with only the cost for the company. The second equilibrium is showing the optimal economic outcome if we include the entire societal cost. Being unable to reach the second equilibrium is considered a market failure. Therefore it is the government’s responsibility to ensure that the second situation is achieved.

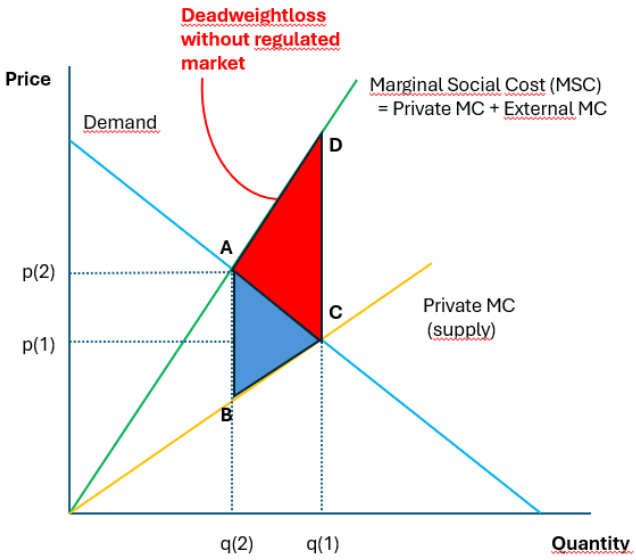

Figure 2: The externality equilibrium

Besides this idea of rationality has there been an evolution on the influence climate change has had on traditional economic thinking. Related to climate action has the concept of 'Green Growth' gained traction. The OECD defines green growth as "fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies" (OECD, n.d.). However, it is not clearly defined what the "resources and environmental services on which our well-being relies" are. This could be the more traditional approach of 'ecosystem services', where nature is an asset that supplies services such as timber for the human economy, or a more holistic view, where for example increased biodiversity leads to better natural temperature regulating systems, therefore helping regions to deal with heath waves. Whilst the principle of Doughnut Economics uses the latter approach (Raworth, K., 2017) does the concept of Green Growth seem to opt for the first, as Lohmann (2016, in Dale et al., 2016 p.3) describes nature as an asset, which just like Adam Smith's capital and labour, is used for productivity gains and increased profit, a view which is shared in environmental economics handbooks too (Proost & Rousseau, 2017).

B) The traditional economic vision and equity

Despite economic growth being the main requirement for welfare increase, does it not say anything about the its distribution (DFID, 2008). Whilst there has been a correlation over time between the increase of household income and economic growth, are there questions being asked about the validity of this statement (OECD General Secretariat, 2019). Therefore, other methods and goals than just growth are being considered, such as the Sustainable Development Goals (SDGs). These successors of the Millenium Goals were set up in order to end poverty and other deprivations "hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests" (United Nations, n.d.). Lim et al. (2018) critique this approach as they show that the great interdependence of these goals influence one another in both positive and negative ways. Furthermore do they show that many of the goals' definitions base on an economics point of view, with a limited allowance for limits on growth, which is exactly the biggest critique on the traditional capitalist approach.

3.2.2. Challengers of the traditional economic vision

The traditional capitalist vision has also led to critique which deems its principles outdated, as the needs of the economy are seemed to be prioritised over climate change measures. Furthermore are the sustainability and climate measures not deemed to be fulfilling enough, which has led to some different approaches and ideas, originating both from the idea of economic growth as well as its rejection. The Sustainable Development Index (SDI) by Jason Hickel is a response on the UN Human Development Index (HDI). The HDI summarises a country's "average achievements in three basic aspects of human development: health, knowledge and standard of living", measured by the life expectancy at birth, the mean and expected years of schooling and the GNP per capita in PPP terms in US Dollars[1] (UNDP, 1990). In contrast, Hickel expands the HDI with two consumption based categories: 'CO2 emissions per capita', which includes all emissions produced in one country and 'Material footprint per capita', accounting for the ecological impact of products, such as the impact of crop and grazing lands or the pollution caused by the construction of materials (Hickel, 2020).

[1] Purchasing Power Parity (PPP) is a method of comparing income between countries whilst including the different local price levels.

This change is argued for by Hickel based on his critique on the HDI, stating that it "pays no attention to ecology, and retains an emphasis on high levels of income that – given strong correlations between income and ecological impact – violate sustainability principles" and that the bias towards income and thus economic growth leads that "the countries that score highest on the HDI also contribute most, in per capita terms, to climate change and other forms of ecological breakdown" (Hickel, 2020 p.1-4). This leads him to argue against a focus on economic growth on the basis that at a certain level a higher income cannot be justified anymore (Hickel, 2020 p.3-4). The projection of the SDI is similar to the HDI, but the aim is to reach the quadrant on the bottom-right. As can be seen in figure 1 in the appendix, does the SDI show that a view slightly deviating from GDP and economic growth can already have major different outcomes.

B) Post-Growth Thinking

Instead of taking economic growth as the engine for welfare improvement, do some see 'excessive growth' as the driver for the challenges of our last few decades, from inequality over war to climate change (Savini et al., 2022 p.6). Savini (2022) states that the "expansion of production and consumption (measured as GDP, but also in other ways) is impossible on a finite planet." Instead, a different vision is proposed: Post-Growth (also known as Degrowth), which should "aim to minimise the impacts of cost-shifting on other human and non-human beings and worlds" (Savini et al., 2022 p.21) and describe externalities as a cost-shifting of private enterprises. This is in contrast to the traditional economic framework, which rewards the companies who are performing this action the best (Kapp, 1963; Savini et al., 2022). Rather than a thought-out rational with intervention schemes, it is an approach with need for practical models for implementation (Savini, 2022).[2]

[2] Degrowth on the other hand goes one step further than Post-Growth. Degrowth argues it is necessary to downscale all economic activities in order stay within the planetary boundaries (Savini, F., 2022).

B.1. Doughnut Economics

One of the most famous worked-out examples of post-growth thinking is Kate Raworth's Doughnut Economics, bridging the gap between post-growth thinking and the policy level (Raworth, K., 2017; Savini, F., 2022). The Doughnut is a response to the traditional economic vision of growth, critiquing its focus on GDP and utility instead of climate and the needs of the people. It argues that the image of growth and GDP as an eternal upwards movement is unreachable within a world with global and social limits (Raworth, 2017 p.31-39). On the social level does the aim of economic growth does not succeed in reaching the SDG goals, whilst the energy efficient character of oil is prohibiting the switch towards green economic growth: the energy level required by renewables to sustain GDP growth is simply out of scope. (Raworth, 2017 p.261-262). Instead, she introduces an alternative framework, the Doughnut, which is not a fixed theory, but should be considered a guideline that needs translation into local culture. (Raworth, 2017 p.44; 299). The Doughnut consists out of an inner and an outer circle. The inner circle represents the social foundation on which a society is built, "life essentials such as food, education and housing[3]. The outer circle consists of the ecological ceiling, where a system is overshooting its ecological capacities. Categories are eg. climate change, ocean acidification and chemical pollution. (*Figure 3)* The goal is to get out of the inner, and not reach into the outer; it is best to stay inside the doughnut in the middle, "the ecological safe and socially just space for humanity" (Raworth, K., 2017 p.44-45). (*Figure 4)*

Instead of using GDP as a measure to compare countries, the Doughnuts requires a more global system with individual approaches. Just like the SDI does Raworth argue that the extra economic growth in the OECD member states is causing a disproportional emission of GHG (Raworth, 2017 p.256). Yet, unlike other degrowth approaches does the Doughnut not necessary abolish the idea of economic growth as a whole. Whilst a decline in GDP (growth) for richer countries is definitely required, it is also important to realise that growth is a necessary requirement in the current global organisation, as it is a major tool for political and social stability (Raworth, 2017 p.261-262). Therefore it is necessary to transition this tradition into a different setting where GDP is not the (only) dominating tool of policy review. Raworth herself vouches to look at the economy as taking care of a planetary household.

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[3] There are also Western cultural principles embedded such as political voice. This paper is not discussing the translation of Western principles into other cultures, but would like to point out that Raworth herself also points out the need for integrity and local flexibility. (Raworth, K., 2017)

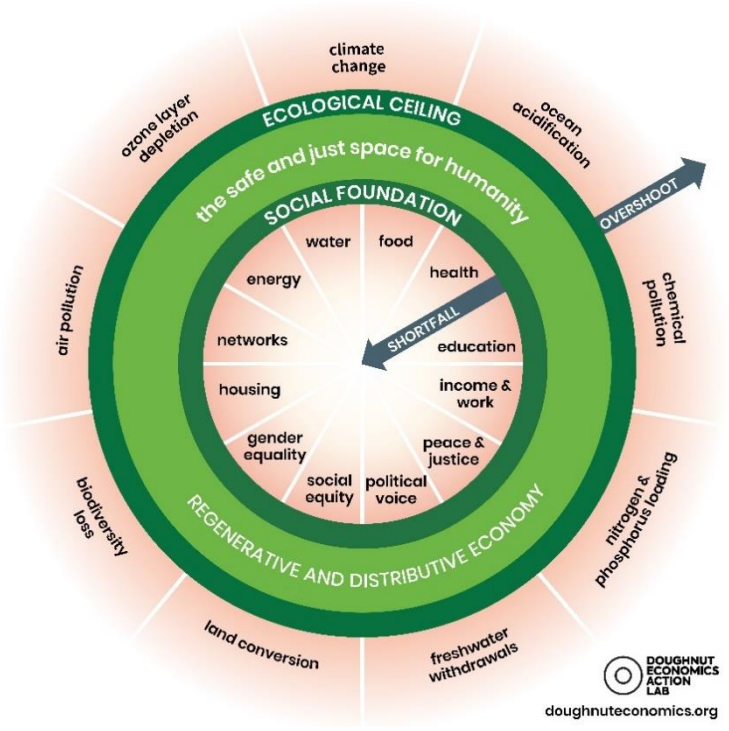

Figure 3: The Doughnut (Doughnut Economics Action Lab, 2020)

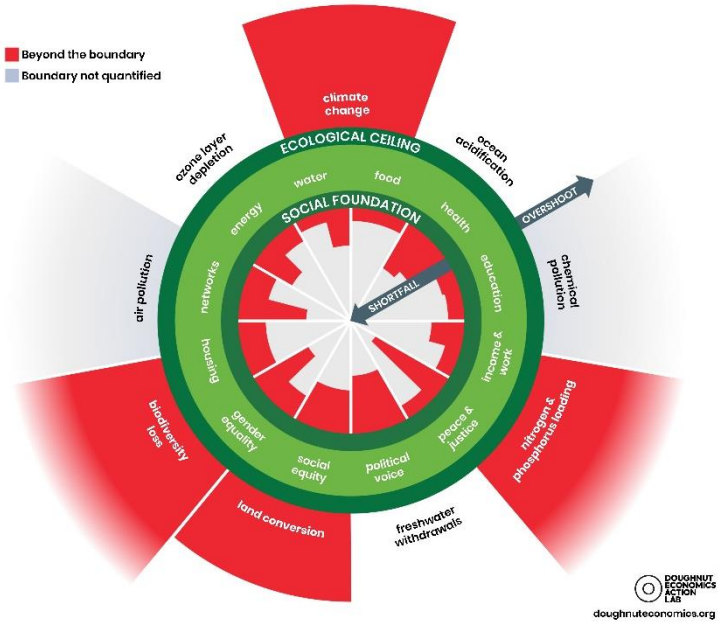

Figure 4: An example of a filled-in doughnut approach (Doughnut Economics Action Lab, 2020)

The origins of this metaphor can be found both in the Greek origins of economics, *'oikonomia':* the 'way to manage the household', as well as Robert Heilbroner's view on sustained life, which he compares to the difficult balance between the capability of a spaceship and its inhabitants demands (Heilbroner, 1960; Raworth, 2017 p.57). Therefore she introduces the "embedded economy", where in contrast to the traditional approach, the economy is not shown on its own, but implemented in the biosphere and the societal system (Raworth, 2017 p.71-72). *(Figure 5)* This view was also present in the work of early economists, such as Mandeville and his Fable of the Bees (Mandeville, 1806). In this embedded economy the Earth is both the source and the sink of energy, provided by the sun. There is a fine balance between the energy present on Earth and how much use of it the Earth can take. The economic system itself contains four different players: households, states, markets and commons. Instead of consumers, the Doughnut talks about people, who can take part in all 4 actors in varying roles. They do not behave rational, but are social with fluid values. Similar to the GHI, households are included because they perform unpaid labour, which is not included in GDP. The state is, just like in the traditional view, a supporting partner for the others. Markets are bound to societal rules and culture. Lastly, commons are not tragic but self-regulated by people, providing extra benefits for society [4] (Raworth, 2017). If the embedded economy acquires economic growth than that is a positive side effect, as the focus should be on equitable distribution and respecting the planetary boundaries.

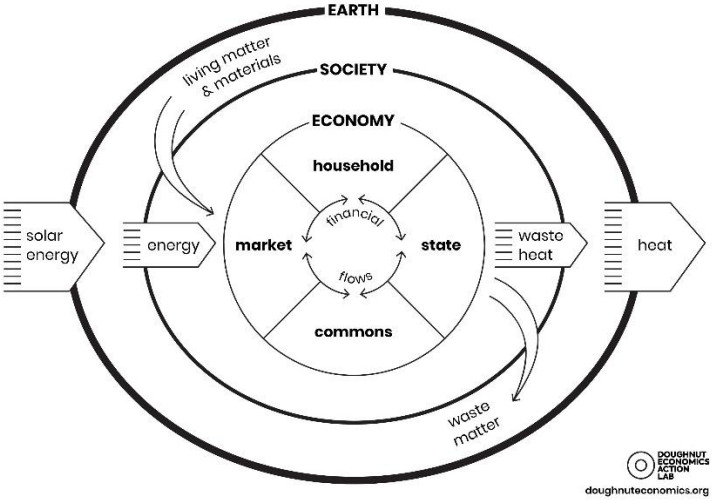

Figure 5 : The Embedded Economy (Doughnut Economics Action Lab, 2020)

[4] An example is Wikipedia. The set-up of the internet is quite expensive, but the maintenance and regulation of this website is based on cheap self-regulation by users.

Inside this embedded economy is also space for a “butterfly economy”, also known as circular economy. *(Figure 6)* Biological and technical nutrients (made out of biological goods) are the inputs for the production of consumption goods. In the case of biological nutrients, such as a coffee bean, the aim is to regenerate and capture as much of the value of the good as possible. So can coffee grounds be used as fertiliser for mushrooms. On the technical nutrient side should products be repaired, reused, restored and recycled, in that order. This would require a new type of product design to allow these products to undergo these stages (Raworth, 2017 p.220-226). The same goes for the design of cities. Having a green, climate proof city requires a suited design and an adequate climate plan. In the following section we will discuss how these paradigms translate into the city and how we can use them to compare and review urban climate plans.

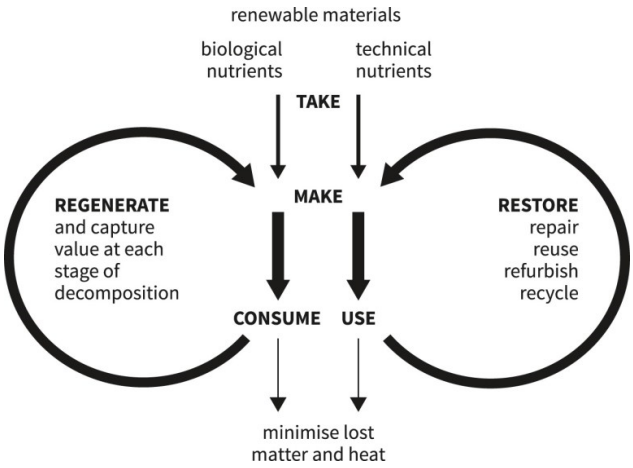

Figure 6: The butterfly economy (Raworth, K., 2017 p.220)

The idea of doughnut economics can be found within urbanism through the THRIVES Framework: Towards Healthy uRbanism: InclusiVe Equitable Sustainable by the urban planner Helen Pineo (Pineo, 2022). Based on a combination of Raworth’s ideas and an overview of health-related urban sustainability frameworks, they present a health equity focused systems approach for social, economic and environmental goals, based on both technical and social knowledge. Development is ought to be sustainable and “supportive to the needs of the current population without compromising the needs of the future” and contains public participation as a central feature (Pineo, 2022 p.984). Their model consists out of three interrelated types of health: Planetary Health, Ecosystem Health and Local Health, of which decisions are taken on several interconnected policy levels and where even the smallest decision can influence the health of urban citizens. Pineo deems their model especially

beneficial in growing urban areas, having the easier opportunity to shape impactful infrastructure for people and planet (Pineo, 2022 p.987). The three levels of health are:

- Planetary Health: the "health of human civilisation and the state of the natural systems on which it depends" (Whitmee et al., 2025 as cited in Pineo, 2022). The aim is to reduce emissions through land use and transport planning that prevents disproportional impact of external effects for poorer and more distant areas. Planetary Health can be supported within the built environment through three goals: improved biodiversity, promoting resource efficiency and a zero-carbon approach.
- Ecosystem Health: the "webs of connections between living and non-living system components" (Buse et al., 2018 as cited in Pineo, 2022). In order to maintain high quality ecosystem services, functional to human health (such as climate and air quality regulation), greenspace quality is to be sustained. Improvement of sanitation, waste and mobility infrastructure can directly impact greenspace functionality.
- Local Health: the neighbourhood scale where planning goals connect people with services. So do buildings shelter people from (extreme) weather conditions and does walkability directly improve the health of inhabitants (Pineo, 2022 p.985-986).

3.3. Urban Climate Planning

Besides the urban visions are we also looking at the effective climate action plans of our different cities. We have already touched on the importance of density planning, where we can add that it is important that this density is not monotonous, but a mixture of different functions: working, living, free time and (public) transportation. This density should be related to a decent level of connectivity and accessibility, providing a maximal use of space and performance as a transport hub (Seto et al., 2014 p.953; 959). The more eco-friendly this densification is performed, the better (Seto et al., 2014 p.957). But density is not the only requirement within climate planning. A good climate plan consists out of several elements. Based on a literature review on the topics of sustainable urban transformation and green urban economy, McCormick et al. (2013) present a framework to explain sustainable urban transformation, consisting out of two dimensions: drivers of change and sustainable urban

structures, with an emphasis on the importance of interactions between the elements *(Figure 7)*. The first dimension is more focused on the societal aspects, where the behaviour of people and especially governments, both on the vision as well as on the action side. The second dimension is focused on the tangible outcomes of policies. However, the most important element of this framework are the relationships and interactions between the different elements McCormick et al. (2013 p.37). We will use this framework as inspiration for the following literature study, used to construct the different elements required for the comparison of the different urban climate plans.

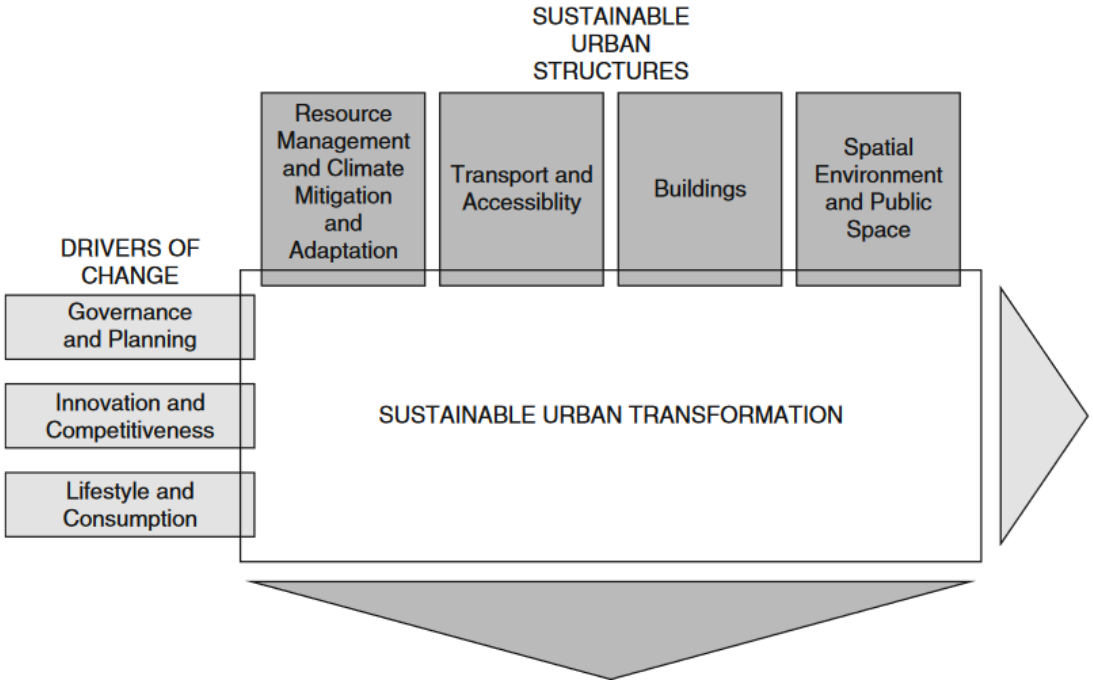

Figure 7: Sustainable Urban Transformation (McCormick et al., 2013 p.37)

3.3.1. Greenhouse gas emission drivers

In order to set the emission reduction targets of a climate plan, it is required to determine the main greenhouse gas emission (GHG) drivers in order to reduce pollution at an as efficient rate as possible. These reduction measures are subject to legislative jurisdiction, but this will be dealt with on the individual level of our cities. According to Seto et al. (2014), responsible for the IPCC Assessment Report of 2014, which reviews and summarise literature on the different aspect of climate change mitigation, there are five main emission drivers within urban systems Seto (2014 p.942-944; 947). This was the first IPCC report with a separate chapter on urban climate mitigation, as stated by the succeeding report (Lwasa et al., 2022).

- Economic geography and income: a higher income comes with increased energy consumption and GHG emissions.
- Socio-demographic factors, such as population structure and dynamics.
- Technology
- Infrastructure and the urban form
- The interdependence of the above

It is important that these drivers are present within a good practice of climate resilient planning, but we should not get stuck on them either. So is there a main part in (urban) consumption as well: in 2006 was the production of cement and steel responsible for seven and nine percent of the global GHG emissions (Seto et al., 2014 p.947). Instead of just focusing on new technology adaptations, should a city also be engaged in the refurbishment of buildings and materials, limiting the extraction of new materials for new projects in the city.

Furthermore it is important to limit GHG emissions in general. Whilst these drivers are showcasing more general themes, does Seto et al. (2014 p.973) also mention an overview of more practical examples of mitigation measures in the urban environment. Besides the before mentioned construction emissions are following categories also regularly embedded in climate action plans: transport, waste, energy supply, urban land use, education, water and outdoor lighting.

3.3.2. Climate adaptation & mitigation

Next, a city needs to define how far it wants to go regarding climate action. The two main approaches within climate action are climate adaptation and climate mitigation (McCormick et al., 2013 p.39). Climate mitigation focuses on the limiting the expansion of climate change, whilst climate adaptation aims to deal with the consequences of this change. On the practical level is mitigation often included in regional and urban containment plans on the macro level and urban regeneration and compact city design on the micro level (Seto et al., 2014 p.960-961). However, within planning literature has there mostly been a focus on normative policies or clarifying climate change vulnerability, without a focus on actual adaptation actions. On the other hand have adaptation studies mostly covered isolated cases instead of including the more complex interactions distinctive for the urban area. (Dhar & Khirfan, 2017 p.606; 618). The same pattern can be seen in low-carbon cities, where investments are usually targeted on

single-point solutions, as adaptation is often “framed as a purely technical issue that can be addressed through climate-proofing interventions rather than something integral to how city systems function” (Tonks & Lockie, 2020 p.191).

However, this system is crucial in both the everyday function of the city, as well as its resilience regarding the effects of climate change. Hurlimann et al. (2021 p.1) state that “well-designed urban planning policy can mitigate GHG emissions and adapt to anticipated climate change impacts.” This policy entails a notion of systems thinking, where one should not focus on a specific location-relevant scale, but “look across interventions or developments”, which is a lesson Tonks & Lockie (2020 p.191) draw in a reflection paper of the European Institute for Innovation & Technology (EIT). This accounts for both climate mitigation, adaptation as general city measures, as “climate mitigation and adaptation are not isolated objectives anymore, but rather “integrated within the need for radical and structural changes in urban systems” and that “governments have framed climate mitigation and adaptation as opportunities for enhancing liveability and wellbeing in cities” Hölscher et al. (2019 p.843-844). One of the requirements is to lock unsustainable path dependencies and support innovative solutions and approaches. However, as of today” business-as-usual interests make planning approaches [which] favour isolated, incremental and short-term responses” (Hölscher et al., 2019).

3.3.3. Climate Governance Capacity

This integration within wider urban systems is demanding an overview of the different aspects relevant to the urban area. Even further, it requires a city to have a capacity to quickly deal with both urban and societal change without losing its inherent functions and identity, also known as resilience (Bugliarello, 2010 in McCormick et al., 2013; Walker et al., 2004 in Berbés-Blázquez et al., 2023). This needs to be reflected into the planning policy instruments, which traditionally consist out of policy instruments, such as land use regulations, building codes and quotas for affordable housing as well as market-based instruments, which are mostly taxes regulating (unwanted) behaviour (Seto et al., 2014 p.962-965). These instruments are necessary to achieve spatial planning goals. However, they might not be sufficient to guarantee a climate positive transition. Therefore transformative governance qualities are required, as “the best plans for advancing sustainable urbanization and low-carbon development, especially in fast-growing parts of the world, will not become a reality

unless there is both the political will and institutional capacity to implement them" (Seto et al., 2014 p.967). Hölscher et al. (2019 p.844-845) state that "transformative climate governance is problem-based with an eye for systemic climate mitigation and adaptation policies, whilst maintaining the environmental integrity, social-equity and wellbeing and keeping track of economic feasibility". Simpson adds that symbiotic relationships among different stakeholders are required for eco-efficiency (Simpson, 2010 in McCormick et al., 2013 p.38). These requirements can be found within Hölschers four types of transformative climate governance capacity, which were developed for a comparative transformative climate governance policy case study between New York and Amsterdam, based on the connection between urban climate governance principles and urban transformation research (Hölscher et al. 2019 p.844-847):

- Stewarding capacity enables learning and flexible responses to (uncertain) change and disturbance. The aim is to gain knowledge on effects and risks through monitoring and continuous learning. According to the IPCC this is one of the main domains for climate mitigation within mature cities with established infrastructure, under which our tree cities qualify (Seto et al., 2014 p.947).
- Unlocking capacity evokes the abilities recognise and dismantle the structural drivers of "unsustainable path-dependencies and mal-adaptations." The aim is to install policies to undermine "vested interests and incentive structures" and to break open resistance towards change by revealing unsustainable path-dependencies. This way awareness for alternatives gets created and support for business-as-usual diminished.
- Transformative capacity supports and promotes novelties that contribute to sustainability and resilience and embeds these novelties within society. By giving them visibility does this strategy also help these novelties breaching the gap from stand-alone projects to city-wide planning.
- Orchestrating capacity is the quality of coordinating "multi-actor urban governance processes, fostering synergies and minimising trade-offs and conflicts." The idea is to create opportunities through strategic alignment and cross-level partnerships.

These four capacities should all be present within the governing body, or in our case, within the daily organisation of the city in order to achieve a fully effective transformation. It should be accompanied by consistent translation in legislation to institutionalise the innovations and enhance the change outside of the "coalition of the willing" (Hölscher et al. 2019 p.853-854).

3.3.4. Just planning

Besides the dimensions of McCormick et al. (2013) is it also important to not neglect the societal transformations caused by a transformative government shift. This is no different for the change towards a more ecological and climate friendly urban environment. Social movements like the French 'gilets jaunes' or European farmers' protests show the importance of a just transition, where every part of society is included as much as possible. This especially the case for the issues concerning climate change as "generally, the urban poor are expected to be disproportionately affected by climate change impacts" (Lwasa, S. et al., 2022 p.876). Further is there a "clear need for consideration of justice at all stages of urban adaptation policy and planning practice", according to Prall et al. (2023 p.2), who have conducted a literature review on "socio-economic projections in urban climate change adaptation planning and decision-making" (Prall et al. 2023 p.1). This is even more valid for climate planning, as climate interventions are often unequal in regards to social and spatial outcomes (Verheij & Corrêa Nunes, 2021). "Failure to consider socio-economic aspects in adaptation [and thus climate] planning can lead to poor understanding of future socio-economic development and vulnerability, leading to inappropriate and ineffective adaptation interventions" (Prall et al., 2023 p.4). Especially considering the "deep uncertainty of future climate and development trajectories and … due to the potential tendency for socio-economic changes to have a greater influence on future urban risk and vulnerability than climatic changes" (Prall et al., 2023 p.8). To deal with these aspects do Prall et al. (2023 p.4) define three types of urban climate justice:

- Distributive Justice: "All urban residents (human and non-human) are able to maintain a high quality of life in the face of climate change related hazards and impacts" and that there is "equitable exposure to climate hazards", benefit from adaptation measures and "access to urban space and services. It is important that the burdens and the benefits are distributed in an equitable way, between both human and non-human residents.
- Procedural Justice: "All urban citizens have the ability to exercise their voice and contribute to decision-making processes surrounding adaptation." This participation is actively promoted and considered at every stage by the planning practice. It is important to include citizens at every stage of the decision-making process

- Recognition and Restorative Justice: the urban planning process is questioning systemic injustice, explicitly prioritising “the needs of vulnerable groups” and seeking “to repair harm done to any urban citizens as a result of climate change impacts and … [bringing] any perpetrators of harm to justice.” With climate justice being recognised by planning and policy making processes. It is important that, following a new set of values, the planning system is making up for climate mistakes made in the past and that the right measures are taking to make up for them. (Prall et al., 2023 p.4)

Tonks and Lockie (2020 p.193) emphasise that in order to have ‘socially just diverse communities’ they need to be ‘meaningfully engaged in decisions made about the future direction of resilience in their towns and cities, which Schlosberg explains as “if you do not participate, you are not recognized” (Schlosberg, 2007 in Verheij & Corrêa Nunes, 2021). This requires a participatory approach of cooperative planning where stakeholders are embedded in the entire process (Prall et al., 2023 p.8), which is important for ‘both cities and their citizens to come to a mutual understanding on the need for collective effort and the support that each can lend to the other while undergoing this crucial transition’ (Liakou et al., 2022 p.28). This requires the engagement of all relevant actors, willingness to co-create and building “reciprocal trust and collaboration” (Liakou et al., 2022 p.28).

3.3.5. Summary

In this chapter we have given an overview of the position of climate change within urban planning. We have explained the importance of urban visions and how they influence long-term planning tools such as climate action plans. On the economic topic we have discussed the main topics and the views towards climate action of the traditional capitalist and the Doughnut Economics approach: the importance of GDP and economic growth and the concepts of externalities and the SDGs for the first and integration of a circular system with social and ecological goals as well as the rejection of GDP dominance and the de-rationalisation of the economic actors for the second. These latter principles have been integrated into an urban planning approach through the THRIVES model and its three systems of Health. Explaining these elements allows us to create comparative criteria to categorise the relevant sections of the urban visions through qualitative text analysis and answer a part of our research question.

In the second part of this chapter we have discussed the different elements required to be contained within urban climate plans, both social and technical. The establishment of these elements in combination with their execution within the organisation of the urban framework, as well as their further integration as models within the field of urban studies, such as Hölscher's transformative governance capacities and Prall's types of urban climate justice, give us a broad base to develop comparative criteria that can grasp the complexity of the necessary coverage within the content of urban climate plans.

The next step in our research is to embed these visions and climate plans into a model where we can compare them, both separately and with each other, to their grade of compliance with the idea from the Doughnut, and whether this creates a difference in outcomes. In order to do so we need to have a look at the framework of comparative studies, more specifically comparative public policy methods. By analysing and comparing the measures included in the cities' respective plans can we obtain a better understanding of the effectiveness of urban climate policies (Navarro-Yáñez & Rodríguez-García, 2020). Furthermore do Falleti & Lynch (2009) mention the importance of a select number of cases to include the role of context, which is unique on each local level (Prall et al., 2023 p.9). However, Feldman (1978 p.298) states that "there is no "field" of comparative public policy", but that one should rather focus on countries (or cities) with common conditions. This entails that if we want to compare policies dated from different institutional settings, we must choose relevant cities from the same region (in this case the EU) with a minimum amount of differences on the qualifications relevant for urban climate planning, clearly define the different units of analysis and variation and try to discover how the plans differ and what that means for the effectiveness of climate mitigation and adaptation measures (Adami et al., 2022; Feldman, 1978; Gupta, 2012). This method is also known as the 'most similar systems' design (Peters, n.d.).

In order to conduct our research as trustworthy as possible it is important to comply to the criteria mentioned above. We believe that the cities chosen (Amsterdam, Copenhagen and Stockholm) and their institutional contexts are relevant and similar enough to be suited for comparison, a given which we will further discuss in detail in section six. These common conditions will shape the base for the criteria of comparison, which are to be based on the elements as discussed in this chapter. In the end these criteria will be used to see whether these similar cities are indeed using 'most similar systems', or whether they indeed differ from one another, what these differences mean for their approaches and outcomes towards climate action and in what sense their economic vision is responsible for these diversions.

4. Research Methodology

4.1. Qualitative Text Analysis

In order to compare the different cities' approaches we are required to analyse their vision texts and climate plans. The vision texts will be analysed through a thematic qualitative text analysis approach, whilst we will use evaluative qualitative text analysis to analyse the climate plans. Thematic qualitative text analysis is mostly used for identifying, systematising and analysing topics and sub-topics and how they are related whilst evaluative qualitative text analysis is useful for assessing, classifying and evaluating content (Kuckartz, 2014)**.** Therefore they are useful for their respectively assigned sampling units. On the level of the urban visions it is more important to identify vocabulary and framework materials related to the economic visions. Targets and outcomes of climate action plans are more quantitative and therefore more suited to be analysed on an evaluative level. The main phases of both methodological approach are similar to each other data is coded into major categories before being elaborated during a second coding round. Finally a comparison and contrast of the different categories can be used for further explanation (Kuckartz, 2014)**.**

Kuckartz (2014) describes a detailed framework for the execution of thematic and evaluative qualitative text analysis. Firstly, he argues for a careful reading of the sampling unites in order to select the relevant text passages, after which thematic categories are determined. These categories can either be based on data and/or procedures, either be constructed through deduction from theories and/or a research question, but they are always linked directly to the content of the texts analysed. We will use a hybrid approach, meaning that we will deduct our categories in two steps. First we will use categories from our theoretical framework for the first coding round. After this round we will add any extra categories deemed relevant from the first reading. Next, a thoughtful overview of these categories in coordination with the highlights of the theoretical framework decide which main topics are ought to be differentiated into further subcategories. After these subcategories are created can the texts be categorised. In the evaluative analysis this provides an overview of the frequency of the categories or the matter of importance of which the categories are present within the text. All of these steps will be performed manually.

4.1.1. Text Analysis Categories

For the analysis of the cities visions, we will mainly make use of the eight "Doughnut Principles of Practice", supported by a few defining characteristics of the traditional capitalist approach. This set-up is based on the approach of this research: investigating whether the Doughnut Economics Approach makes a difference in the creation of urban visions and climate plans. For the analysis of said plans we will use categories originating from the four subchapters as described in the theoretical framework: 'GHG Emission Drivers', 'Climate 'Mitigation and Adaptation', 'Climate Governance Capacity' and 'Just Planning' with their subsequent subcategories. Opposite meanings will also be included within the categories.

A) Urban Vision Categories

According the Doughnut Economics Action Lab (DEAL) it is a requirement for anyone trying to integrate doughnut economics in their organisation to follow the "Doughnut Principles of Practice" (DEAL, n.d.-b). This is a requirement that the City of Amsterdam has underwritten and should therefore be a suited tool to define any differences between the different cities' visions (Gemeente Amsterdam, 2021a). The eight Doughnut Principles of Practice are:

- **Embrace the 21st Century Goal**

  Aim to meet the social needs whilst staying within the planetary boundaries.
- **See the big picture**

  Finance systems and their targets are not ought to dominate society.

  A well-organised society recognises the roles of all players in the economy: households, commons, markets and the state.
- **Nurture human nature**

  Improve and strengthen community networks and citizen participation.
- **Think in systems**

  Ensure space to experimentation, learning, adaptation and continuous improvement.
- **Be distributive**

  Create equity by using open design to ensure all contributors benefit from the created value.

- **Be regenerative**

  Use the cycles of the living world as much as possible: share, repair and be thoughtful about resource efficiency.

- **Aim to thrive rather than to grow**

  Growth cannot be a goal in itself.

  Be aware of the point where work could be done by others instead of increasing one's own size.

- **Be strategic in practice**

  Follow entrepreneurship without having voices being neglected.

  Be open yet integer.

  Encourage peer-to-peer inspiration.

  (DEAL, n.d.-b)

Alongside these will we also make use of following categories representing the capitalist vision :

- **Economic Growth**

  Focus on economic expansion and GDP.

- **Rational Behaviour**

  Focus on the desire of utility (and thus financial) maximalisation

- **Sustainable Development Goals**

  Implementation of or inspiration from the Sustainable Development Goals within urban visions

- **Other**

  Fitting none of the above

B) Climate Action Plan Categories

The discussion within the theoretical framework has delivered following categories for the first round of the textual climate action plan analysis:

- **Density Planning**

  Mixing of functions, improving connectivity and limiting ecological footprint

- **Greenhouse Gas Emission Drivers**

  Limitation of GHG emission and the acknowledgment of the interdependence of sectorial emissions
- **Climate Adaptation and Mitigation**

  Measures to deal with or limit climate change and their integration within each other and the urban setting
- **Climate Governance Capacity**

  Sufficient institutional capacity to reach the targets
  - **Stewarding Capacity**

    Enabling learning and flexibility in order to broaden the city's climate knowledge
  - **Unlocking Capacity**

    Breaking open rigid structures and drivers to/and install drivers of change
  - **Transformative Capacity**

    Support sustainable novelties
  - **Orchestrating Capacity**

    Ensure trans sectorial and transdisciplinary cooperation
- **Just Planning**

  Include measures against the effect of socio-economic transformations caused by a transformative shift
  - **Distributive Justice**

    Equitable spread of burdens and benefits (in)between both human and non-human residents
  - **Procedural Justice**

    Facilitation and promotion of public participation
  - **Recognition and Restorative Justice**

    Prioritise the needs of vulnerable groups and compensate for climate mistakes from the past
- **Other**

  Fitting none of the above

5. Cities

Comparative studies require a well-grounded argumentation for the choice of subjects. In the case of our choice of cities does this entail that they need to be relevant and, as mentioned before, as similar as possible outside of their climate action plans. For this research we have chosen the cities of Amsterdam, Copenhagen and Stockholm as subjects based on following reasons: all three cities are the capital of their respective countries with a similar PPP (World Bank Open Data, n.d.), are located in a similar geographic and topographic area with a similar climate (KMI , n.d.), have a close relation to nearby water bodies and are part of a larger agglomeration containing several other (satellite) cities. Furthermore are Amsterdam and Copenhagen known as cycling capitals and do both Copenhagen and Stockholm see themselves as leading examples in the world on the topic of climate friendly urban environments (Gemeente Amsterdam, 2021a; Københavns kommune, 2018; Stockholms stad, 2021). Lastly are the cities not entirely comparable in population, with in 2023 around 950,000 inhabitants in Amsterdam and Stockholm and around 650,000 in Copenhagen (750,000 when including the enclaved city of Frederiksberg, which is not included in Copenhagen's climate plans) (Website Onderzoek en Statistiek, n.d.; Statistik efter ämnesområde - Stockholms stad, 2023; Statistikbanken, n.d.). However given the prevalence of major cities in Northern Europe, this difference should not be considered as significant.

5.1. Institutional Setting

On the level of urban planning analysis are all three cities situated in a political system which uses the "comprehensive integrated approach" (Nadin & Stead, 2008, 2013). This means there is a national hierarchy of urban plans and that there is an integration of spatial policy and public investments, which requires a coordination between different levels in the field of policy and daily organisation. Another way of describing this approach is that urban planning is performing the function of 'integrator': assimilating and coordinating different policy topics such as housing, economy, environment and public housing. This coordination can be seen in the structure of the cities' urban policy, which consist out of a long term urban vision as an umbrella framework for the cities' different goals (Gemeente Amsterdam, 2021a; Københavns kommune, 2018; Stockholms stad, 2021).

The topic of these goals is dependent on the legislative responsibilities of the different cities. In the Scandinavian context there is a big focus on local independence: local governments "have planning monopoly and usually own the land that is being developed, which gives cities a far chance to impact its itineraries" (Lilius in Kristjánsdóttir, 2017 p.301). This means that cities can have a big impact on population density, building regulations and their sustainability (Which Seto et al. (2014 p.947) show to have a major impact on GHG emissions, as mentioned before). Furthermore is the Scandinavian approach on the level of sustainability characterised by an emphasis on neo-liberalism, where there is a need for a balance between economic stimulation, the fair distribution of the economic output and the prevention of ecosystem degradation (Campbell, 1996; Sager in Kristjánsdóttir, 2017).

On this level do the Danish municipalities have responsibility for topics as nature, environment and city planning, and are all municipalities obligated to have a climate action plan (Finansministeriet, n.d.; Klimatilpasning.dk, n.d.). However, this climate plan is aimed at the risks of climate change and does not need to contain any active climate change policies (Klimatilpasning.dk, n.d.). Further is the Danish climate action situated on the national level, as the national climate law is not even mentioning the word "kommune", the Danish word for municipality (Energistyrelsen, 2016). This is in contrast with the Swedish climate law, which is segmented in different policy levels with their own responsibilities. Whilst the federal level is responsible for the national climate strategy goals and the divisions of responsibility, it is the task of the regions and local municipalities to ensure change. Regions are responsible for regional transport whilst the municipalities have a major role in the structure: every of their responsibility is considered affected by the climate. Besides a master plan to deal with climate-related damage are they also responsible for building permits, environmental supervision & protection and nature conservation (Klimatanpassning.se, n.d.).

Meanwhile is the Dutch planning system dependent on a very structured approach, meaning that any development is required to be in accordance with the local land use plan. This does not mean that these plans are completely independent, as (property) developers can strongly influence their contents during their development (Nadin & Stead, 2008). Since January 2024 are these plans integrated in the 'Omgevingswet', a national umbrella law that includes all local and national planning related actions, as well as organisational practicalities such as the application for permits (Waterstaat, 2013). The Omgevingswet also transfers a lot of legislative power towards the municipalities (VNG, 2024), which are currently responsible for a wide array of tasks, such as the monitoring and reduction of emission levels, environmental

protection and spatial planning (Koninkrijksrelaties, 2012; Rijkswaterstaat, n.d.). The municipalities are obliged to create their own binding "Omgevingsvisie" covering all activities on their territory (Gemeente Amsterdam, 2021a p.21). This gives Dutch municipalities a big opportunity to increase their steering capacity and integrate policy goals as defined under the comprehensive integrated approach (Gemeente Amsterdam, 2020 p.44). This is especially the case for big municipalities with an elaborate staff. Lastly does the Omgevingswet obligate municipalities to develop a long-term spatial planning vision, such as the 'Omgevingsvisie Amsterdam 2050' (Gemeente Amsterdam, 2021a p.25).

5.2. Individual City Level

Besides the institutional level do we also have to look at the individual city level. In this section we will discuss the following visions and climate plans:

	Visions	**Climate Plans**
Amsterdam	Omgevingsvisie Amsterdam 2050 *(2021)*	Nieuw Amsterdams Klimaat – Routekaart Amsterdam Klimaatneutraal 2050 (*2020)* Onze stad van morgen – Duurzame toekomst stad Amsterdam *(2022)*
Copenhagen	Verdensby med Ansvar – Kommuneplan 2019 *(2019)*	CPH 2025 Climate Plan *(2012)*
Stockholm	Stockholm City Plan *(2021)*	Climate Action Plan 2020-2023 *(2020)* Environment Programme 2020-2023 *(2020)*

(Gemeente Amsterdam, 2020b, 2021a, 2022; Københavns kommune, 2012, 2018; Stockholms stad, 2020a, 2020b, 2021).

Furthermore do the cities of Amsterdam and Copenhagen have a separate document related to climate adaptation: 'Uitvoeringsagenda Klimaatadaptatie' and the 'Copenhagen Climate Adaptation Plan' (Gemeente Amsterdam, 2021b; Københavns Kommune, 2011). A separate analysis of these documents was performed in support of the category 'Climate Adaptation and Mitigation'.[5]

Apart from their climate documents did the city council of Copenhagen launch a 'Copenhagen Doughnut' in 2023 (Københavns Kommune, 2023a). We will not follow the same analysis procedure for this document, as it is not related to the CPH 2025 Climate Plan and there is no such document available for the municipality of Stockholm. However, in section 6.1. we will shortly compare this document to the 'Stadsdonut voor Amsterdam'. Written by DEAL in cooperation with bio-inspired consultancy bureau Biomimicry 3.8, global impact organisation Circle Economy and C40 Cities, it was and still is the starting point for the Doughnut Approach used within the city of Amsterdam (DEAL et al., 2020).

5.2.1. Amsterdam

The municipality of Amsterdam has one main vision and two main strategic documents related to urban visions and climate planning: the 'Omgevingsvisie Amsterdam 2050', 'Onze stad van morgen – Duurzame toekomst stad Amsterdam' and 'Nieuw Amsterdams Klimaat – Routekaart Amsterdam Klimaatneutraal 2050'. The first is a legally binding document describing the future vision of the municipality (Gemeente Amsterdam, 2021a), the second describes the sustainability principles the city wants to follow (Gemeente Amsterdam, 2022) and the third contains the main lines in which this can lead to climate neutrality (Gemeente Amsterdam, 2020b). Considering their age there is less potential to review results, but nevertheless does the municipality of Amsterdam upload a yearly update on the CO2-reduction measures. Whilst there is some overlap between the different documents will we try to summarise their content.

[5] All policy documents used in this research were published in English, apart from the documents related to the city of Amsterdam, as well as municipal plan for the city of Copenhagen. Non-English sections were translated into this paper by hand of the researcher.

A.1) Omgevingsvisie Amsterdam 2050

The Omgevingsvisie focuses on Amsterdam's different targets up to 2050. These contain different topics from housing over neighbourhood development to sustainability, but are based on "five strategical choices" (Gemeente Amsterdam, 2021a p.49). The city is expected to have a similar population and housing growth rate as in the 2010s: namely 150,000 units for 250,000 inhabitants. On top of that are 200,000 jobs expected to be created. The idea is that this growth can only happen within the current city borders, whilst strengthening the social fundamentals and not exceeding natural limits (Gemeente Amsterdam, 2021a p.17-18). This requires specific measures such as densification to free up space for other utilities, improving public transport and determining the optimal place for each service following the 15-minute city principle, where in this case all necessities are supposed to be within walking or biking distance (Gemeente Amsterdam, 2021a). This strategy also includes an increase of public transport availability and limited car access. Lastly does the plan require the connection of the different goals whilst including all relevant stakeholders in the goal-reaching process.

In order to become a climate neutral city has the municipality adopted the principles of the doughnut economy, which they have used to shape their sustainability vision as well as control mechanisms (Gemeente Amsterdam, 2021a p.166 & 247). The municipality has defined three value chains where it can have a direct positive influence: food and organic waste, consumption goods and the built environment (Gemeente Amsterdam, 2021a p.177).

When relating the Omgevingsvisie to the definition of urban visions can we see that there is a separate is a subchapter dedicated to the vision of Amsterdam. This is an example of an integrated vision within a wider city plan, related to the new Dutch Omgevingswet, which was explained earlier in this paper.

A.2) Duurzame toekomst stad Amsterdam

The sustainability vision document of the municipality of Amsterdam describes the importance climate action, as "it is showing future generations that we have undertaken action" and that "a better climate starts at the government" (Gemeente Amsterdam, 2022 p.7). The city should be prepared for the physical consequences of climate change, mainly extreme weather effects, as well as the social consequences created by both climate change and its preventive measures. The vision describes an action plan for the climate which entails following main strategies: co-creation with different stakeholders, integration of extreme

weather risks within climate adaptation plans and a trial-and-error approach where circular choices are the standard instead of the exception (Gemeente Amsterdam, 2022 p.15). These approaches are expected to be strengthened by three transitions: a sustainable energy transition, including emission zones and green energy production; a green transition, where higher biodiversity and health levels are connected; and a transition towards a circular economy, which the municipality describes as "van circulaire dingen doen naar dingen circulair doen" *(from organising circular practices to being a circular practice)* (Gemeente Amsterdam, 2022 p.28-35).

A.3) Routekaart Amsterdam Klimaatneutraal 2050

"The Routekaart Amsterdam Klimaatneutraal is an ambition document with a long term vision on the Amsterdam energy transition and short term actions". It describes the "most important ingredients" to ensure a change from fossil to renewable energy. Besides this document there is also a strategic document 'Amsterdam Circulair'. 'Amsterdam circulair focuses on the creation of a circular economy and the reduction of primary resources used, whilst the 'Routekaart Amsterdam Klimaatneutraal' focuses on CO2-reduction (Gemeente Amsterdam, 2020 p.4).

The plan is supposed to contain the effects of increased heatwaves and cloudbursts and to manage the increased energy demand, whilst keeping the energy production climate friendly. It is split up in four different sections: 'built environment', 'mobility', 'electricity' and 'port and industry', which are together responsible for 100 percent of the cities pollution, which is set on 5000 kton CO2-equivalents in 2020 (Gemeente Amsterdam, 2020 p.10). The measures with the biggest singular impact on the emission reduction are the decoupling of (private) housing from gas heating and replacing it by a communal heat district, the goal of pollution free transport by 2030 and the phasing out of fossil fuels in the industrial area of the Port of Amsterdam (Gemeente Amsterdam, 2020 p.14; p.26; p.34). In order to achieve these goals there is a need for engagement on all societal levels and increased innovation in CO2-reduction solutions. For supporting the first has the city set up an online climate platform to help and inform locals. The latter is dependent on more factor such as European cooperative projects and cross-partner knowledge exchange (Gemeente Amsterdam, 2020 p.40; p.42).

5.2.2. Copenhagen

The city of Copenhagen has one municipal plan: Københavns Kommuneplan 2019 based on the future vision for the city: 'Verdensby med ansvar – Kommuneplanstrategi 2018 for København' (*'world metropolis with responsibility, municipal strategy 2018 for Copenhagen*), and one climate action plan: 'CPH 2025 Climate Plan' (Københavns kommune, 2012, 2018, 2019). These documents are older than the others discussed in this research yet they are still relevant on the premise of following reasons: first of all is a city plan in Copenhagen valid for twelve years, with a revision every fourth year, which has been postponed to after the publication of this research (Københavns Kommune, n.d.-b, n.d.-c). Second does the city yet have to publish a follow-up climate plan for the period after 2025 and up to 2035 (Københavns Kommune, n.d.-a). Therefore are these documents the current available representations of framework for one of the world's most renowned cities on the topic of climate change policy and sustainability (Københavns kommune, 2012) and can they provide a different point of view on climate change policies. This is especially the case as the Climate Plan is older than the first the publication of the Doughnut Economics idea in 2017.

B.1) Københavns Kommuneplan 2019

The kommuneplan is focused on the physical and population growth of Copenhagen, which is rising rapidly after a downfall during the mid-1900s. Since 1954 has the city gained 18 percent surface area through land reclaim from the sea and between 2019 and 2031 it is expecting a population growth of 100,000, reaching 725,000 inhabitants.[6] The kommuneplan requires this growth to be stimulated whilst maintaining the highest possible quality of life for all, being CO2-neutral by 2025 and beholding the unique characteristic of the city (Københavns kommune, 2019 p.8-13), as "Copenhagen is internationally known for … its green solutions, hand in hand with economic growth, job creation and higher quality of life" (Københavns kommune, 2019 p.50). The vision contains a focus on the growth of both housing units and industrial areas and wants to reach the WHO air quality standards. One of the measures towards this specific target is a goal of 75 percent green transport (walking, cycling, public transport) and 75 percent of all commutes to be performed by bike. Therefore there is a plan for extra public transport lines as well as improved climate proof car facilities

[6] This does not include the enclaved city of Frederiksberg, which is a separate municipality.

(Københavns kommune, 2019 p.14-30). The municipal plan also focuses on the international character of the city, with amongst others a requirement for the expansion of the airport (Københavns kommune, 2019 p.50-51).

Similarly to the city of Amsterdam does the kommuneplan have a separate chapter dedicated to the urban vision of the Danish capital. Therefore we can use the kommuneplan as a representation of the urban vision of the city of Copenhagen.

B.2) CPH 2025 Climate Plan

The CPH 2025 Climate Plan is setting out the guidelines to reach the goal of Copenhagen's carbon neutrality in 2025. The plan focuses on six sectors: electricity consumption, individual heating, traffic, communal services heat consumptions, district heating consumption and others, of which the last three categories are marginal (Københavns kommune, 2012 p.8). The reduction efforts are mainly focused on energy production with a share of 74 percent of the total reduction amount, to be reached by a shift towards carbon neutral district heating and a goal to become a net exporter of green energy by implementing more wind turbines (Københavns kommune, 2012 p.13-19; p.37). Further does it promote the concept of green growth, stating that in the period 1990-2015, the cities' real GDP has grown by 50 percent whilst the CO2 emissions have dropped by 40. It is not clear how this reduction is calculated. This green growth is accompanied by an improved quality of life by the introduction of the heating grid, the creation of the harbour baths and Copenhagen cycling culture (Københavns kommune, 2012 p.11). Beyond 2025 does the plan foresee further energy consumption reductions, a phase-out of biomass and coherent and integrated visitable green solutions (Københavns kommune, 2012 p.20). Due to the greening national Danish energy mix will the export of green energy not be sufficient to retain carbon neutrality. Therefore the city defines carbon neutrality as a "moving target" (Københavns kommune, 2012 p.14).

Furthermore does the plan discuss the separate sectors in detail, focussing on the individual intra-sector allocation of emission reductions and a cost-effective saving measures approach. This means that the municipality has calculated the financial gain per sectorial reduction for each inhabitant. The total savings return in a separate chapter in the document, with an estimate saving of 6,500 DKK per couple (with a kid and a car) per year, of which 4,000 DKK on energy alone. These savings are augmented by the gradual conversion towards green solutions, the positive external effects of the increased health and quality of life and the

expected price rise for conventional energy sources. In return does the municipality need to invest 2.7 billion DKK over the course of the plan. This investment does entail retrofitting and (public) transport improvements, as energy production and private sector emissions are outside the responsibility of the municipality. The municipality is expecting 200 to 250 billion DKK private investments in this sector, with a further 20-25 billion encouraged by the Climate Plan. Lastly is it expected that the municipal investments create between 28,000 and 35,000 new jobs (Københavns kommune, 2012 p.56-61).

6.2.3. Stockholm

Besides its City Plan, which describes the cities' vision for 2040 does the city of Stockholm provides two policy documents to explain their climate change policies: the 'Environment Programme 2020-2023' and the 'Climate Action Plan 2020-2023'. The first describes how Stockholm is ought to be a more sustainable city, the second how it is supposed to reduce GHG emissions (Stockholms stad, 2020a, 2020b). Both documents are part of a programme towards a fossil fuel-free city, started in 2012 (C40 Cities, n.d.), the same year as the publication of the CPH 2025 Climate Plan.

C.1) Stockholm City Plan

Stockholm's vision for 2040 consists out of four elements: a 'growing city', a 'cohesive city', 'good public spaces' and a 'climate-smart & resilient city' (Stockholms stad, 2021 p.6). The first goal aims to create an attractive city which is punching above its weight, with a high-grade of accessibility and an economy which can act as an engine for both the local region and the entirety of Sweden. The second goal aims to shape a network of urban spaces for human encounters, well-integrated public transport and daily destinations in every area, leading to the variety of public spaces represented in the third goal. The fourth and last goal aims to create climate-friendly and robust urban environments through effective land use and flourishing green infrastructure (Stockholms stad, 2021 p.20-27).

The municipality has the opportunities to reach these goals, as it is targeting 140,000 new homes by 2030 but is also owning 70 percent of the land available. This combination is giving the opportunity to leave a stamp on Stockholm's future and plan for future generations, where it plans to use architecture and new transport developments, such as an expansion of the metro

and increased cycling, to integrate city goals. The plan also focuses on higher education, as 54 percent of the city's economy is knowledge intensive, requiring highly educated inhabitants and on the solidification of its touristic attraction compared to other European cities. Lastly does the city council have the goal to keep its position as a world leader in sustainable urban environment (Stockholms stad, 2021).

The Stockholm City Plan is a continuation of the city's vision for 2040 (Stockholms stad, 2021 p.3). Because the City Plan is more tangible and therefore useful in the analysis of the climate action strategies for the city of Stockholm, can we consider the Stockholm City Plan as a representation of the urban vision of this city.

C.2) The Environment Programme 2020-2023

The Environment Programme depicts Stockholm 'as a world leader in work on sustainable development" with an aim to be fossil-free by 2040. It presents the goal of a dense and interconnected city with seven sub-goals based on the SDGs. Besides does the plan aim for sustainable growth to strengthen collaboration and innovation to provide good conditions for continued good welfare, life and city growth, which it wants to achieve through inter-partner collaboration, a different purchasing strategy and increased green communication (Stockholms stad, 2020b p.1-9).

The city council aims to become fossil-free by 2030, with a deadline of being fossil-free and climate positive by 2040 for the entire city. This means that no greenhouse emissions can be generated, which besides a production focus will also need to be translated in product consumption, of which the emissions are currently for 60 percent located outside of Sweden. This reduction is to be reached through reduced and electrified private transport, a termination of combustion in heating, increased impact from the municipality, a more circular economy approach with increased product recirculation and eventually Carbon Capture and Storage (CCS). Besides fossil-free does the city also have to become more adapted to torrential rains and heat waves (Stockholms stad, 2020b p.10-24).

C.3) Climate Action Plan 2020-2023

The municipality has defined that to reach the goal of carbon neutrality the city has a carbon budget of 19 million tonnes of CO2-equivalents (CO2e). This includes all energy use within the geographic boundaries of the municipality, including heating and cooling, road transport, rail traffic, shipping and take-offs and landings at Bromma airport as well as gas and electricity consumption. In 2018 did the city produce 2,110,000 tonnes of CO2e, of which 48 percent was caused by transport, 32 percent by electricity, and 19 percent through gas use. The municipality was responsible for 7 percent of these emissions (Stockholms stad, 2020a p.1-11). From a consumption perspective do public consumption and investment, and household count for 40 and 60 percent of the Swedish carbon emission, with household transport and household food consumption each responsible for 20 percent of the total emissions (Stockholms stad, 2020a p.52).

The climate action plan 2020-2023 foresees in 474,000 tonnes CO2e reductions with a focus on road transport, heating and cooling, electricity generation & use and gas production & use, of which the latter two have marginal impacts on the emission reduction. On the road transport aspect does the municipality have a focus on fuel replacement measures, such as subsidies to renewable fuels and environmental differentiation of the city congestion tax. On the topic of heating and cooling is the combination of the closure a coal plant and the increase of waste incineration and recycling of plastic crucial to reach the reduction targets (Stockholms stad, 2020a).

6. Analysis

In this section we are handling with the results of the qualitative text analysis and discuss our findings within the urban visions and the climate action plans. We will also shortly discuss the Amsterdam and Copenhagen City Doughnut. None of the local development plans within the visions were taken into account. Furthermore were the categories “See the Big Picture” and “Think in Systems” merged due to an overlap in topics observed.

6.1. The City Doughnuts

When comparing the ‘Copenhagen Doughnut’ with the ‘Stadsdonut voor Amsterdam’, we can detect a few differences: The Copenhagen Doughnut uses a mixture of SDG goals (for the social foundation) and own political targets (for the planetary boundaries) of which the individual progress is to be tracked on a yearly basis, without discussing possible measures or links between the policy domains. Unlike the Stadsdonut is the Copenhagen Doughnut not linked to the DEAL. This is not a requirement for a good Doughnut Approach, but given the small amount of city Doughnuts present it would make comparison easier, especially given the difference that Amsterdam is using the Stadsdonut as leverage for change. The biggest difference is that the municipality of Copenhagen is using the Copenhagen Doughnut as a yearly checklist for the progress of individual targets. Therefore it considers the Doughnut as a future situation which is reachable through the realisation of a set of politically decided goals (Københavns Kommune, 2023a p.4). In contrast is the ‘Stadsdonut voor Amsterdam’ a sort of compass for the course the city is supposed to sail, using singular issues based on the views of citizens, the local and the worldwide environmental impact of Amsterdam as examples for the implementation of the Doughnut approach within the city (DEAL et al., 2020).

6.2. Urban Vision Analysis

After the first analysis round of the urban visions, it became clear that the Amsterdam Vision was the only one to have content related to all doughnut economics related categories, as to be expected given their engagement towards the Doughnut Economics Action Lab. What is also striking on first sight is that apart from the category “Be regenerative”, every city’s vision is represented, and that the difference in number of references between the cities is smallest in the category “Embrace the 21st Century Goal”. Similarly can we see a high output number of references on the category “Economic growth” for the city vision of Copenhagen. In this

section we will further discuss every category separately and compare their content between the different cities.

- **Embrace the 21st Century Goal**

The three cities have some overlapping goals within this category, namely emission reductions and a transition towards clean air and noise pollution limitation. This overlap is only situated on the level of planetary boundaries. However does the vision of the city council of Amsterdam go further, trying to reach the inner side of the doughnut by envisioning overarching themes, aiming to reach societal and natural related goals (Gemeente Amsterdam, 2021a p.15). The same strategy can be found within more specific targets. The main themes are focus on equity, liveability, urban connections and use of materials and resources. Examples of more specific targets are clean energy & circular economy, relaxing the overheating real estate market and the prioritisation of green modes of transport. This overarching approach is missing in the other two visions which favour separate goals, mainly focused on housing quantity and quality as well as some liveability measures (Københavns kommune, 2019 p.9; 12; 15; Stockholms stad, 2021 p.27; 45) and climate adaptation measures against the consequences of heavy rainfall and floodings (Stockholms stad, 2021 p.101).

Overall within the urban visions there is a lack of presence of social and planetary themes within overarching goals. However, when combining separate goals within the visions there is a notion of interdependence of the themes, which leads to a step towards the Doughnut. This is especially visible within the Amsterdam vision, but very less the case for both Scandinavian visions.

- **See the big picture & Think in Systems**

Amsterdam wants to use the challenges and the development of the city to combine and reach ambitions across sectors. So does mention the problem that whilst electric cars are less polluting on site, they still take up the same amount of space within the city (Gemeente Amsterdam, 2021a p.188), hindering plans and solutions in different target categories. Further does it also mention the versatility and multifunctionality of green areas, which can have social, climatical, food and biodiversity functions (Gemeente Amsterdam, 2021a p.215; 217). Besides these techniques does it also see the city as an excellent space for renewal and experimentation and does Amsterdam desire to continue its role as an early adopter of

innovation, creating value for its citizens (Gemeente Amsterdam, 2021a p.44; 58). Copenhagen mainly emphasises the topic of housing, with room for dialogue with and between (private) partners in construction as well as experimentation within the sector to find new ways of living. Furthermore does it want to experiment with new green multifunctional areas and does it discuss a complete vision towards both energy and mobility (Københavns kommune, 2019 p.9; 11; 13). Stockholm understands the notion for inter-sectorial and cross-government level cooperation and sees experimentation in the form of innovation as most crucial on the level of climate mitigation (Stockholms stad, 2021 p.41; 104).

In its vision does the city of Amsterdam understand the complexity and interdependence of urban questions. It actively searches for efforts that can lead to combined results, whilst presenting the urban scope as the perfect location for experimentation. The other cities represent this categories less, as they are only focusing on specific sectors. Furthermore is their relatively little overlap with the categories' description, but this could be due to the overlapping content with other categories in our analysis.

- **Nurture human nature**

Amsterdam's approach sees public participation as an integral, as 'people shape the metropolis" (Gemeente Amsterdam, 2021a p.34). Projects should be integrated within society and room should be given to public cooperations as existing communities are the backbone of the city (Gemeente Amsterdam, 2021a p.20; 34; 48; 250). A different focus was chosen within the other cities. Copenhagen focused on citizen dialogue, cooperation and involvement whilst Stockholm mentioned their plan for a cohesive city, trying to limit social differences and improving public spaces and access to "fundamental urban features, such as services, culture and public transport" (Københavns kommune, 2019 p.22; 51; Stockholms stad, 2021 p.6; 12; 24).

We can see a gradual increase in the importance of citizen participation in the different visions. Whilst Stockholm prioritises the organisation of the urban framework in order to shape conditions for citizens to participate does Copenhagen intend to experiment with direct opportunities for co-creation. The city of Amsterdam has already included this last structure within their organisation and sees it as an integral part of their policy.

- **Be distributive**

Amsterdam's vision plan focuses heavily on the concept of equity and equal chances. Every initiative is requested to return value to the city, growth and welfare increase is to be captured and spread equally. More in detail does this mean that middle income jobs need to continue to be prevalent, that urban services are available and accessible for everyone. One of the reasons behind this strategy is that the city is shaped by its citizens, and that the more people feel connected to a place, the more likely they are to interact with and protect it (Gemeente Amsterdam, 2021a p.16; 17; 38; 69; 180; 241). Within this category do the Scandinavian cities focus more on affordable housing and the accessibility of public transport, ensuring equal access to urban assets and avoiding social inclusion through bad public transport connections (Københavns kommune, 2019 p.8; 28; Stockholms stad, 2021 p.32; 49).

Once again does this show a difference in approach, where the city of Amsterdam is operating as an active broker to create citizen equity on all facets by actively promoting, facilitating and organising opportunities for social change, whilst the approach of the two other cities is more passive, trying to create a base layer through the accessibility of basic urban services. If and how equity should be created from here is not discussed, possibly implying an implementation of the 'invisible hand' on the organisation of urban life.

- **Be regenerative**

Amsterdam's vision only mentioned the importance of the transition towards circularity in all facets, and the aim for less consumption and food waste.

- **Aim to thrive rather than to grow**

In their Omgevingsvisie does the city of Amsterdam explain how excessive growth is considered a burden for the city, both on the topic of size, capital as well as population. It demands that growth receives a responsible place within the city, with a focus for physical growth on the outside areas of the city as well within the other municipalities within the metropolis area and even the national level. As sustainable growth is understood to have limits is this growth supposed to be limited within the current city borders (Gemeente Amsterdam, 2021a p.15; 17; 38; 74; 76; 106). This argument is reflected in Lwasa, S. et al. (2022 p.883), which gives an overview of worldwide urban land expansion from land covers, saying that 40 and 60 percent of European urban growth come from natural grounds and agricultural use

respectively. This is bringing several issues along, such as loss of biodiversity and increased pressure on existing farmlands. This understanding is lacking in Scandinavian approaches, where the growth of the city is used as a starting point and main support for the focus on the importance of the city centre: whilst Stockholm still wants to expand outside of the city centre does Copenhagen's Kommuneplan specifically mention that the city is to be the overarching shopping and experience centre for the greater metropolitan area and that it "Should be possible for Copenhageners to move outside of the municipality without having to risk their job" (Københavns kommune, 2019 p.23; 25; 26; 28; Stockholms stad, 2021 p.3; 34).

There is a clear division between the procedures of the city of Amsterdam and those in Copenhagen and Stockholm. The Scandinavian approach is to see the city as the centre of metropolis' life. This is especially the case in Copenhagen, as the municipal plan aims to keep growth and attraction within the city centre. This is contrasting the Amsterdam view, which is actively providing space to other municipalities and wants to divide growth over the municipalities within the metropolis without increased stress on the open space.

- **Be strategic in practice**

All three cities mentioned this category with slightly different nuances, focusing on neighbourhood initiatives (Amsterdam and Stockholm), cooperations (Copenhagen and Stockholm) and higher education (Stockholm).

- **Economic Growth**

All three cities mention their importance as economic engine for the region and that they want to keep their allure in the world economy, with Copenhagen even specifically mentioning that they target a higher relative growth of jobs in their metropolitan area than the urban areas of Stockholm, Amsterdam and Oslo (Københavns kommune, 2019 p.25). The difference between the cities is that for Amsterdam economic vitality is desired, as it provides the city with income and its inhabitants with jobs (Gemeente Amsterdam, 2021a p.17). In contrast, the cities of Copenhagen and Stockholm actually pursue (physical) growth, seeing opportunities in tourism and the circular economy to continue growing and attracting new types of services and business. The city council of Stockholm is actively constructing new housing to keep attracting economic growth, as "the city is currently punching above its weight" (Københavns kommune, 2019 p.24; 26; 28; Stockholms stad, 2021 p.6-7; 10-11; 20-21; 61)."

Whilst all cities recognise the importance of economic growth do they have a different view towards its importance. The Doughnut influence is clearly visible within the Omgevingsvisie, as Amsterdam values the importance of economic growth in a different way than the two Scandinavian cities: not as an overarching main importance. Meanwhile is their international exposure and its relationship towards economic growth of great importance for both Copenhagen and Stockholm. They even actively promote the expansion of (luxurious) tourism, a practice that Amsterdam has been recently trying to organise and even limit (Gemeente Amsterdam, n.d.; Het Parool, 2023).

- **Rational Behaviour**

Whilst the city of Amsterdam is worried about its financing capabilities on the long run, do the visions of the Scandinavian capitals show more traditional rational behaviour. So does the city of council of Copenhagen have a specific target for the growth of high educated jobs and do both cities want to maintain their self-perceived international leadership within sustainable urban developments, where green solutions go hand in hand with economic growth, job creation and increase quality of life Stockholm focuses on the economic spill-overs effects of well-functioning public transport more high-quality tourist infrastructure as well as the improvement of the stability and resilience city's green structure, not for targets related to the doughnut, but for their ecosystem service performance (Gemeente Amsterdam, 2021a p.39; Københavns kommune, 2019 p.23; 26; Stockholms stad, 2021 p.6; 20; 79; 97).

For the cities of Copenhagen and Stockholm does this category seem to be in support of the tactics discussed in "Economic Growth". The vision descriptions presented display a rational economic reasoning in the way that they are developed with a rational or economic output in mind.

- **Sustainable Development Goals**

The SDGs were barely mentioned within the visions.

- **Other**

The elements from the city's visions present in this category could be returning within the climate action plans, as they mention the stimulation of the development of electric car facilities and cleaner cruise ship docking installations (Københavns kommune, 2019 p.15; 18), the necessity of climate mitigation (Stockholms stad, 2021 p.10), multifunctional use of spaces (Gemeente Amsterdam, 2021a p.84; 182; 224-225; Stockholms stad, 2021 p.63; 87) and density planning. Especially the latter is quite profound within the Omgevingsvisie. The city proposes measures such as a dependency of office availability and the presence of high rises on the public transport capacity. Furthermore do they promote a density planning method which could be classified within the 15-minute city concept (Gemeente Amsterdam, 2021a p.68; 76; 85; 105; 182; 192). Later we will discuss whether these elements return in the climate plans.

6.2.2. Overview

When using a Doughnut Economics approach to analyse the approaches within the urban visions in Amsterdam, Copenhagen and Stockholm, we can determine two main patterns: System Complexity and Rational Behaviour. The pattern of System Complexity is mainly visible in the categories "Embrace the 21st Century Goal", "See the Big Picture" and "Think in Systems". In their vision does the city of Amsterdam intend to combine urban challenges and reach a more all-inclusive approach towards city making where actions are (indirectly) targeted on several topics at once. This awareness is not present in the visions of Copenhagen and Stockholm, where the focus is laid more on separate topics or sector-related combinations, such as energy and mobility.

The pattern of Rational Behaviour can be found within the categories "Nurture Human Nature", "Be Distributive", "Aim to Thrive rather than to Grow", "Economic Growth" and "Rational Behaviour". In this pattern there is once again a major contrast between the Amsterdam approach and the approach of the two Scandinavian cities, where the principles of the invisible hand and market self-regulation are present within the visions. This can be seen within their approach towards welfare distribution and equity creation, where they see a role for the municipality to shape the basic conditions for citizens to create their own welfare optimum. Furthermore does their strategy show characteristics of the traditional capitalist paradigm within their approach towards economic growth, which can be seen within their views on the role of the city centre, on tourism and spill-over effects of public transport and

housing. Out of a perspective of both physical as well as economic growth do both cities see the city centre as the major centre of the urban setting, both within regional as even national settings, a role which deserves full support in the future onward. This role can be further supported by the active promotion of the expansion of touristic activities and the increase of the cities international reputation. Lastly are the investments on education, green solutions, housing and transport mainly driven by their positive spill-over effects on economic growth.

In contrast does the Omgevingsvisie Amsterdam have a different approach towards these themes. It wants to use the capabilities of the municipality to shape the city into an active broker for the creation and distribution of welfare and equity without putting extra burden on the open space surrounding the city. Therefore, whilst acknowledging the importance of the role of the city centre, it wants to actively work together with other municipalities and regions in order to limit the negative externalities of (excessive) growth on both inhabitants as well as nature. Instead of seeing investments as a support towards economic growth, it sees investments as an opportunity to experiment and improve living conditions for all organisms within the area.

Whilst all three visions contain elements which can be categorised under the Doughnut Framework, do these elements contain rather big content differences, with the Doughnut following city deviating from the others. Although the latter does not completely comply to all elements, are the differences significant enough to be taken into account. We will combine these findings with the analysis of the climate action plans in the Discussion section.

6.3. Climate Plans Analysis

All three cities' climate plans have varying content which is reflected in the presence of the different categories. Whilst Density Planning, Distributive and Restorative Justice were underrepresented by at least one city, was there sufficient meeting with the other categories. Because the City of Amsterdam was the only city present in the latter two very related categories have we decided to merge them. Below will we discuss in what sense the content of these categories differs per city. During the analysis we decided to split up the "other" category due to a significant amount of content.

- **Density Planning**

This category was barely present within the climate plans, beside the recognition of the use of urban planning and the benefits multifunctional spaces by the city of Stockholm and the question how to free up city space for electricity production in Amsterdam.

- **Greenhouse Gas Emission Drivers**

All three cities' climate plans ultimately rely on CCS(U)[7] and focus on two categories: energy production and consumption and transport. Furthermore does the city of Amsterdam focus on 'built environment' and 'harbour & industry', aiming for a 55%/95% emission reduction compared to 1990 levels by 2030/2050 respectively, compared to Copenhagen's and Stockholm's goals to become carbon neutral (no net greenhouse gas emissions) by 2025[8] and 2040 respectively. On top of that does the Stockholm's city council aim to become fossil-free by 2030 (Gemeente Amsterdam, 2020a p.10; Københavns kommune, 2012 p.6-8; Stockholms stad, 2020a p.5; 9-10). The reduction categories overlap with the IPCC reference scenario for mitigation potential for urban areas (Lwasa, S. et al., 2022 p.890), giving us a base for generalising our discussion section.

However, there are some major differences between the approach towards these goals. Amsterdam wants to link the emission reduction to a greener, more biodiverse, healthier and climate adaptive city through an approach of 100 percent renewable energy, sustainable housing, clean transport and an eye for the emission print of materials. 81 percent of its emission is related to material consumption located outside of the city, meaning the city's choices have a direct impact (Gemeente Amsterdam, 2020a p.6; 15; 18-19; 30, 2021b p.5). Copenhagen on the other hand wants to link energy consumption to an energy production transition, aiming to become a net exporter of renewable energy, which is accounting for 3/4 of the city's total reduction. The plan even accounts for a reduction deficit of 70,000 tonnes, which will turn into a surplus as the national Danish energy mix will turn greener and therefore requires new action post 2025 (Københavns kommune, 2012 p.8-9; 14). Lastly does Stockholm focus on becoming fossil-free on their geographical territory, while also taking into account that the measures taken cannot lead to a transfer of emissions elsewhere, as well

[7] Carbon Capture Storage (and Usage)
[8] Copenhagen shall not reach this goal (DR, 2022).

as the realisation that 40 percent of their emissions are related to consumption and investments (Stockholms stad, 2020a p.5; 9, 2020b p.14).

It is important that to note that all three cities have different definitions of emission responsibility. As mentioned does Stockholm cover the emissions produced within their own geographical territory. This is a different for the city of Amsterdam, which incorporates all direct territorial emissions except international ship- and air traffic and biomass use. However does the city also incorporate the emissions of the electricity and heating production which is produced outside of the city, but consumed within. Lastly does the city of Copenhagen not specify any kind of emission responsibility.

- **Climate Adaptation and Mitigation**

Both Amsterdam and Copenhagen have separate climate mitigation plans and refer to them in their respective climate plans. Amsterdam focuses on the development of new guidelines towards climate adaptation and is very open about the sources used. Furthermore does their process entail a network approach, where projects should be integrated within other policy goals. Lastly does the document have an approach on different levels, where there are different possible measures for the different scopes: grading from at home to the European level. Examples are the free collection of tiles (‘at home’), testing of climate adaptive measures (street level) and a neighbourhood focus on the containment of water, both for the prevention of flooding as well as the containment of heat waves (Gemeente Amsterdam, 2021b p.16-17; 23-24; 32).

This is in contrast with the climate adaptation plan of Copenhagen, which is mainly focusing on anti-flooding measures caused by torrential rains, and to a lesser extent the rising sea levels. Unlike the Amsterdam adaptation plan does the plan not focus on the containment of water, but does it rather prefer to ‘release if possible, retain if necessary’ using increased sewer capacity and anti-flood constructions. Whilst it shares the principles of plan synergy and the aim of a greener city, does the Copenhagen Climate Adaptation Plan also have a focus on green growth, having an emphasis on research of growth potential for each project. This is both to ensure that every project repays itself, as well as the future economic benefits for the city of Copenhagen. The document argues that, with increased worldwide interest in climate adaptation measures, a head start in the development of green solutions can be beneficial for the city (Københavns Kommune, 2011 p.6; 9-10; 13-16; 22; 29-33; 63-66).

The city of Stockholm does not have a separate climate adaptation plan. Further, when turning to its climate action documents does it not go deep into possible adaptation measures. The city only expresses the wish to become “climate-adapted” and to have “improved ability” to deal with the effects of heatwaves and torrential rains (Stockholms stad, 2020b p.7; 18). Remarkably, no added details are mentioned in their strategy.

- **Climate Governance Capacity**

Before discussing the different subcategories it is worth noting that Amsterdam had some parts that fitted under this main categorical umbrella. The city sees itself as having four different roles: Performing, Regulating, Cooperating and Cooperating, which sort of overlap with the four subcategories. Furthermore does the city council use the “Sustainable, unless” approach, making sure that everyone within the city council feels responsible for the common goal of sustainability (Gemeente Amsterdam, 2022 p.15; 21).

- **Stewarding Capacity**

Just like the city council of Stockholm does the city council of Amsterdam aim to become climate neutral, which they want to achieve through a way which can be described as ‘leading-by-example’. Furthermore does the Dutch capital want to stay flexible through a combination of top-down initiatives and bottom-up initiatives, leaving space for citizen-driven projects. Lastly is open access to the decision-making process crucial: from the inclusion of individual actors being crucial to reach certain targets to opening up the climate office for weekly run-in question times.

Similarly to Copenhagen and Stockholm does the city of Amsterdam also support/conduct research. Whilst Amsterdam and Stockholm specify their research topics (eg. new ecological techniques such as hydrogen, nature conservation and positive economic effects) is this not the case for Copenhagen (Gemeente Amsterdam, 2021b p.8; 29; 42; 44, 2022 p.19; 21; 24; 38; Københavns kommune, 2012 p.21; 31; 50; Stockholms stad, 2020a p.49-50, 2020b p.19).

- **Unlocking Capacity**

The city of Amsterdam states that a "wide societal change with a major impact on our economy and daily life" is necessary to achieve sufficient sustainability (Gemeente Amsterdam, 2020 p.7). This change is including circularity as a standard, but most and foremost a learning-by-doing approach. Stockholm underwrites the leading role for the city's organisation, but aims to limit itself to milestones, terms within purchasing contracts and communication. Besides does it want an increased focus towards circularity and more sensible consumption. Lastly does the city of Copenhagen open up its city as a green lab for experiments, primarily carried out by (private) (energy) companies, using carbon neutrality as "leverage for innovation, new jobs and investments" (Københavns kommune, 2012 p.8). It also focuses on its limited direct impact on national level legislation (Gemeente Amsterdam, 2022 p.13; 37; Københavns kommune, 2012 p.14; Stockholms stad, 2020a p.49-50, 2020b p.10; 21).

- **Transformative Capacity**

Under this category can we once again find Amsterdam's self-prescribed role as leader-by-example: by supporting sustainable alternatives it increases the chance of reaching its emission reduction targets. Furthermore does it want to introduce an emission-free zone in the city centre and stimulate sustainable modes of transport, decoupling of the gas infrastructure and support hydrogen infrastructure. Stockholm wants to function as a test-case for climate-smart solutions and introduce artificial intelligence developments. Copenhagen focuses on architectural guidelines for rooftop solar cells and support initiatives towards a market with new transport fuels and energy optimisation. This category is very similar with the previous, and should be analysed together (Gemeente Amsterdam, 2021b p.6; 15-16; 19; 25; 35, 2022 p.7; 32; Københavns kommune, 2012 p.33; 42; Stockholms stad, 2020a p.49-50, 2020b p.10; 21).

- **Orchestrating Capacity**

A common important feature in all climate plans is the need for collaboration. The city of Amsterdam mentions the importance of the contribution of each partner involved, and thus also give space for their own ideas. A similar sound can be heard in Stockholm's plans, where collaboration with internal and external partners is considered crucial for reaching the climate goals. This approach of multilevel climate cooperation is considered the most impactful (Melica et al., 2018). For the city of Copenhagen, collaboration is limited to joint initiatives with business, government and research partners (Gemeente Amsterdam, 2021b p.26; 34-35,

2022 p.6; 17; Københavns kommune, 2012 p.4; 8; Stockholms stad, 2020a p.8; 13; 62, 2020b p.6; 9; 12; 31).

- **Just Planning**
    - **Distributive Justice / Recognition and Restorative Justice**

The city of Amsterdam was the only city to be mentioned within these categories. They emphasize the need for an equitable distribution of the efforts and benefits in (energy) transition, where those who can afford it contribute more. This way the city wants to prevent the increase of social inequality and even introduce a social transition. Organising this is seen as an important task for the municipality, as unequal climate situations can lead to socially discriminating situations. An example is the prevalence of learning disorders within neighbourhoods that are less equipped against heat waves. Further does Amsterdam specifically emphasizes that if citizens have to make an effort, an even bigger effort is to be expected from so-called big polluters. Lastly is the battle against climate change seen as a responsibility towards the future generations (Gemeente Amsterdam, 2020a p.7; 17; 41, 2022 p.6-7; 9; 13-15; 17; 35).

    - **Procedural Justice**

Citizen initiative and participation is a key element within the climate strategy of the city of Amsterdam. This importance is also present in the climate plans of the two Scandinavian cities, but to a lesser extent: Stockholm and Copenhagen focus more on communication towards and dialogue with citizens about their contribution and involvement in context with their climate plans (Gemeente Amsterdam, 2021b p.40, 2022 p.6; 17; Københavns kommune, 2012 p.4; 8; Stockholms stad, 2020a p.8; 13; 62, 2020b p.6; 9; 12; 31).

- **Other**

This category was very present in the analysis with two overarching themes appearing: ‘International Presence’ and ‘Economic Content’. All three cities state their desire to be amongst the world leaders in sustainability, with Copenhagen even linking it to their international reputation and as a driver for tourism. Besides this mention of international reputation does the city of Amsterdam also focus on its responsibility: Sustainability as an absolute necessity to sustain a functioning society, a role it is required to take up as the capital of one of the most prosperous cities in the world. Therefore they deem it important to think in

a green way, meaning including nature and all its diverse benefits: from climate adaptation over social wellbeing to health benefits. Lastly the city mentions the importance of combining the emission reduction with all other city targets set (Gemeente Amsterdam, 2021b p.7; 44, 2022 p.5; 9; 34; 39 ; Københavns kommune, 2012 p.4; 11; 20; Stockholms stad, 2020b p.4).

This combination of targets can also be seen in the financial approach the cities use. Both Amsterdam and Copenhagen discuss their plans funding aspect. Whilst the first is considering financial feasibility of their plans, it is also arguing for the saving aspects performed by climate action as the investments can prevent external costs up to four times the costs of their cost, with even potential financial municipal instability caused by a so-called 'shock event'. Copenhagen on the other hand is completely focusing on the financial aspect of their plans: from the saved costs on extra energy production due to the lower consumption, over external returns through eg. improved citizen health, to emphasising the maximal economic return on a fairly limited amount of investments: the Copenhagen Climate Plan requires a total of 2.7 billion DKK municipal investments, with a multiplicator effect[9] of 20 to 25 billion DKK and an expectation of 200 to 250 billion DKK private investments and 30,000 new jobs. It also mentions that without a "reduction in energy consumption, the transition will be too costly from an economics aspect" (Gemeente Amsterdam, 2021b p.44, 2022 p. 25; Københavns kommune, 2012 p.9; 12; 20; 57; 59; 60).

Furthermore do the climate plans of Stockholm and Copenhagen focus on economic growth; whilst both cities want to be attractive and dynamic with a high level of growth and attractive businesses does Copenhagen often specifically emphasise the importance of green growth throughout its climate plans. It sees the carbon neutral transition as a key element to sustain and even increase economic growth, depending on private companies for climate investments to stimulate economic benefits for the city and its inhabitants. It is that present in the city's climate vision that the concept of (green) economic growth is mentioned 33 times in the CPH 2025 Climate Plan. This is in great contrast with Amsterdam's sustainable vision, which is following the Doughnut Model, prioritising 'a broad sense of well-being' instead of focusing on economic growth (Gemeente Amsterdam, 2022 p.5; 13; 25; Københavns kommune, 2012 p.4; 10; 11; 13; 26; 36-37; 53; 56; Stockholms stad, 2020a p.8; 36, 2020b p.4; 6; 8).

[9] In economic theory, the multiplicator effect are the extra investments caused by one singular investment. This way an investment can have trickle down effects and stimulate extra economic growth.

6.3.2. Overview

There are some reoccurring themes within the climate action plans of the cities of Amsterdam, Stockholm and Copenhagen. On the level of emission reduction do they focus on similar topics, they all aim to become fossil-free and depend on CCS(U) techniques. Furthermore do they see climate action as a matter of international competition where they aim to be amongst the leaders. But the way they present towards a fossil-free future differs. In their climate action plans does the city of Amsterdam see the sustainable transition as a urgent matter and absolute requirement and responsibility. Further does it want to use this transition as an opportunity for not just climate, but also social change, aiming to improve the entirety of the city in all its facets. This comprehensive approach links emission reduction to increased biodiversity, a climate-adapted city and a more socially equitable society, the latter it wants to achieve through a mixture of unequal but equitably spread efforts, especially by major polluters, citizen participation and a learning-by-doing approach, where the urgency of the situation calls for action techniques which are likely to not be fully developed yet. Lastly does the city expect this sustainable transition to lead to a new and changed functioning of daily life, with a central role for circularity and eventually consumption-based emissions, originating from outside the city. Hereby do they use the Doughnut model as a guideline whilst they accompany and support their citizens during this voyage.

This all-inclusive approach is missing in the climate action plans of Stockholm and Copenhagen in an increasing way. In its climate plans is the city of Stockholm focusing on its own territory with a realisation that it should prevent the relocation of pollution and consider consumption-based emissions. Just like Amsterdam does it see a leading role for itself in the sense of leading-by-example, but it focuses on the climate milestones set, research, municipality purchasing contracts and communication with stakeholders, including citizens.

The city of Copenhagen has the most deviating climate plan, where it mainly focuses on energy production. Whilst it is opening up its territory for experiments with said novelties, does it try to downplay its own responsibilities by referring to its limited (inter)national legislative shaping capabilities. Nevertheless does it specifically aim to promote its own international reputation as a green and leading capital with leading practices of a sustainable future. These practices are mostly expected to originate from the private industry, as proposed emission reduction measures such as real-time information for public transport users are unexpected to say the least. Besides its main focus on energy production does it also have a

limited role for citizen involvement in mind, but a even more importance for the concept of (green) economic growth. The city aims to make the transition as cheap as possible and focuses on its economic consequences, using the climate plan as a tool to enhance economic growth.

7. Discussion

As mentioned before, it is important to return to the "Other" category of the urban vision analysis. We notice that the concept of density planning was not present within the climate plans, something which might imply a decoupling of the importance of urban planning and climate action. However, the comprehensive goal approach of the city of Amsterdam and the focus on architecture and green solutions of the city of Copenhagen and Stockholm suggest differently. Presumably it is seen as a non-direct form of climate action, and therefore not mentioned within the actual plans, although the concept of density planning could support Copenhagen's approach of emission reduction through decreased energy consumption.

This contrast would be even bigger when looking at the actual measures (to be) taken by the different cities, but their local specificality and technicality would be too far from the scope of this research. In general it can be said that the set-up of the action plans and the overall goals and targets are quite similar, but that the way towards it entails differences which cannot be neglected. These differences are visible between both the urban visions and the climate action plans and will be explained below. Bluntly said we can position the three cities, Copenhagen, Stockholm and Amsterdam, in that order, on an increasing scale from traditionally capitalist to Doughnut Economist.

7.1. The role of the city

The concept Doughnut Economics requires a comprehensive approach towards the organisation of our society, where the minimal requirements for social needs are met, and the ecological limits are not being crossed. This can be found within the climate approach of the city of Amsterdam: by combining the urgency of climate change with social measures, the city is showing that it is following and understanding the principles of the approach it has officially adopted. Amsterdam wants to play an active and leading role within the energy transition, a transition which it expects to contain big social consequences. To prevent these, the city does not just want to prevent extra inequalities to sprout, it actively wants to diminish social inequalities and injustices in order to reach the middle of the Doughnut (see p.55). This means that they are following the contract they have signed with DEAL, which is an important criterium to be checked before continuing our analysis.

Whilst concepts as system complexity, cooperation, welfare distribution and an active broker role for the city are present in the climate action process of a city that has been following the Doughnut principles, this is not the case for the cities of Stockholm and Copenhagen. Here, an increasingly rational method is being followed, with a city that is only responsible for the basic requirements towards a sustainable future, a future that is to be shaped by all the other partners without influence or steering from the governance level. It reflects a belief in a type of invisible hand on the 'market' of sustainability and justice. This notion of market forces can be further witnessed within the approaches of these Scandinavian cities, where synergy projects to reach climate and/or urban targets are limited to related fields (such as energy consumption and production) and where the importance of the impact of international reputation, fundability and especially economic growth is omnipresent (see p.45-46; 48; 56).

The notion of international reputation contains a remarkable duality. First of all are all three cities, in different degrees, promoting themselves internationally as sustainable solution leaders, a notion which is trickling down on different levels of their visions and climate action. Especially within the city of Copenhagen this notion is very present, using their international reputation as a method to attract tourism and even a main reason to perform climate (mitigation) action (see p.48). Second do especially the Scandinavian cities see themselves as the centre of the local and national life and society, as well as both international sustainable research and development (see p.47-48). However does specifically the city of Copenhagen avoid showing the responsibility of acting accordingly, which is in contradiction

with their slogan: ‘Verdensby med ansvar’ (*Metropolis with responsibility*). Just like the Dutch and the Swedish capital does the Danish capital have a voluntary goal to reach carbon neutrality. But unlike the other two is Copenhagen not bound to (less stringent), legally binding national targets and responsibilities. Yet, by limiting their own expenditures, actively advertising their investment efficiency and their dependency on private companies do we argue that they create a notion of voluntary sustainability that is built on a very thin layer of credibility (see p.48; 56-58). This impression is further strengthened by their argumentation towards their limited jurisdiction for the creation of environmental requirements and targets, such as air pollution or the limitation of emissions from the transport and construction sector. The city of Copenhagen states that this limitation is due to national and European legislation. (Københavns kommune, 2019 p.19). It is true that the Danish climate legislation is situated on the national level. It is also true that the European Union uses the principle of supremacy for their authorised policy domains, of which climate is one. However, it is not because European legislation has priority over national or local laws, that member states or regions are not allowed to impose more stringent criteria. The only necessity is that they are not conflicting with the supranational legislation, which is not the case for stricter environmental criteria (EUR-Lex, n.d.).

7.2. The Influence of Economic Growth and Rational Behaviour

Besides the presence of international reputation in the documents does the importance of economic growth majorly distinguish the differences between the climate approaches of the three cities. Amsterdam, following the Doughnut Economics Approach, is very clear in its communication and sees climate action as an urgent matter of survival and responsibility for the city, where “growth within limits” is the major approach: the city can grow both economically and population-wise, but this must happen in a controlled way ensuring no extra burden on the city’s inhabitants as well as non-urban land use (see p.37; 47-48). However does Copenhagen preach the opposite, using the broad term of green economic growth as an opportunity and even a requirement for climate action (see p.56-57). Even though liberal-growth oriented planning strategies are regularly prevalent in Denmark (Galland, 2012), do we find it remarkable that the economic growth capacity present in such a degree within both the reasoning and the actions of climate change planning in Copenhagen.

Apart from the importance of economic growth does the city of Copenhagen also depend on external actors for the realisation of their climate targets. Whilst this is the case for every city studied, and also for every city and region worldwide, is the scale of this dependency interesting. Whilst the measures of the city of Amsterdam are responsible for about one third of the expected reduction by 2030 (Gemeente Amsterdam, 2020a p.47), is this percentage not clear for the other two cities. However, as the CPH 2025 Climate Plan expects an amount of direct private investments ten times higher than the municipalities' own input (and even 100 times more when including indirect investments), it can be understood that the private financial effort is considered important (see p.56). This is not just related to the topic of investments, given the financial benefits mentioned for Copenhagen households (see p.40). Thus, as the financial part is very prevalent throughout the plan, and private household investments account for a minimum of one third of the indirect investments, we can definitely see a deviation from the Amsterdam Doughnut approach, where equity through unequal and big efforts from big polluters are main elements. This is especially striking considering these household investments account for maximum 25 percent of the total emission reductions. Meanwhile does the city of Stockholm follow the principle of "sustainable growth", but does it not further specify its details. From the understanding of the documents we can be interpretate "sustainable growth" as situated in between traditional and green growth.

These arguments should be held against the age of the CPH 2025 Climate Plan, as it was published before the creation of the idea of the Doughnut. As urban challenges and ideas change throughout time (Pineo, 2022), we cannot just criticize the differences between the Copenhagen climate action approach and the Doughnut. Instead, we need to take these limitations into account. However does the Climate Plan, despite its age, have significant overlap with the more recent Stockholm vision and climate action plans, especially in their view on the role of economics in society and its influence on climate change action. Besides did the Danish capital become a leading example, as it was the first capital to promote ambitions to become a climate-neutral city, and that on a very short notice of 13 years only (CNCA, n.d.-a).

7.3. The responsibility of the sustainable transition

Lastly do the three cities have a different vision on the urgency and responsibility of climate action. In combination with the Doughnut approach does the city of Amsterdam emphasise the urgency and the leading role of the city and its council during the process (see p.54). This is fitting with the comprehensive integrated approach in Scandinavian and Dutch planning, although not as present in the visions of the Scandinavian cities. Whilst we find Stockholm showing responsibility through city council's actions, such as purchasing contracts and own goal settings, is this notion a lot less important within the climate actions of the city of Copenhagen. This is in contrast with the approach of the Dutch capital, underlined by statements as "it is our experience that optional action leads to higher costs and slows down the process" and the end of trans-shipment of oil and coal in the Amsterdam harbour: although not bound for the Dutch market, and thus not part of the direct emissions of the city, does the city consider it bad manners to pursue climate neutrality whilst still actively earning on and contributing to pollution elsewhere (Gemeente Amsterdam, 2020a p.75; 147).

This latter argumentation is rather interesting for a climate approach, and even urban management in general. Whilst traditional capitalism finds it an acceptable policy measure to apply profits to fund costs elsewhere, is this often less accepted by the public. So can the allocation of emission taxes to lower employment taxes perfectly make sense from a traditional capitalist perspective. It is namely the goal to create the most welfare (money) in the cheapest way possible. If this financial transfer generates the most profit, it is the most economic feasible. Hence the CPH 2025 Climate Plan and the Stockholm climate plans are supporting a sustainable transition, as, especially for Copenhagen, it is considered the best way of ensuring growth and welfare for the future. However, this is making abstraction from the possibility that a new perspective is necessary, especially given the growing consensus that a higher-than-average income is disproportionally contributing to pollution and climate change. Copenhagen and Stockholm actively support a transition following this route, without considering if the route they are taking might part of the cause of the matter that they are battling in the first place. This is exactly why studying the policies of these two cities is useful: the CPH 2025 Plan is dating from an, from a climate policy view considered, different era, yet it is still largely overlapping with sustainability views of more recent plans, showing a consistent presence of the traditional capitalist vision. This vision, however, might portrait climate action in a too simplistic way. A way that is already visibly different in the climate

visions of the city of Stockholm, where geographically transferable and consumption-based emissions are being incorporated.

7.4. Understanding the Doughnut

One could say that only way of figuring out whether our analysis is true, is waiting. As Copenhagen will publish their new climate plan towards 2035, the question is whether the idea of the Copenhagen Doughnut will be implemented. Yet, it is to be seen if a Doughnut implementation will be accompanied by a Doughnut approach, and followed by a Doughnut understanding. The difference between the vision of the Copenhagen Doughnut and the expression of the Doughnut approach in Amsterdam is that the first describes a tangible doughnut that is reachable through the fulfilment of a set of non-connected self-determined targets, whilst the second projects the Doughnut as a vision without a stringent definition of what it exactly is supposed to be. This is because the framework of the Doughnut, unlike the idea of economic growth, is not supposed to be a fixed theory and is even explicitly calling users to adapt the framework to fit local requirements (Raworth, 2017 p.44; 299). Unlike its simple visualisation, is it difficult to reach its core. And even if one manages to do so, does it not mean it is a finished product. One can decide to bake a doughnut and reach a tasty end-product, but that does not make that recipe perfect. This is especially the case for Doughnut Economics, where the basic ingredients are defined, but where the recipe and the end result is up to the baker. How the City of Copenhagen is currently approaching the Doughnut is by taking the different ingredients, but not mixing them into a sticky dough, which could rise and make a better connected end product. Instead, they equalise the baking progress to the collection of the ingredients and seem to consider that the final destination. This is similar to how they seem to approach climate action: as a simple and cheap set of steps which make up a lot of the way. And which, most importantly, bring economic growth. Although slightly less, the climate action of the city of Stockholm is containing the same idea. In contrast, the city of Amsterdam expresses the desire for an alternative approach, using the Doughnut Economics framework as a guideline towards a future which is non-targetable and non-tangible, but where they think their citizens will be happy and their environment will be strengthened against the challenges of a changing climate.

The question is whether this implementation is going fast enough. All three cities see themselves as leaders on the topic of sustainable solutions. Especially the City of Copenhagen is highly renowned for being a frontrunner in sustainable solutions (CNCA, n.d.-b; ICLEI, 2017; The Guardian, 2019). However, its implementations are more simplistic than both the urban planning context, the complexity of climate change and its issues, and their proclaimed leadership in sustainable solutions would expect it to be. A leader is supposed to act as an example. But does a leader need to follow the ideas which it thinks will make it considered as such, or does it have to opt for what it deems to be the most responsible and climate-friendly? For a city so engaged with its sustainability reputation, it is striking how little the city of Copenhagen wants to invest financially in its climate plan: about as much as necessary to run the urban planning department over the same period (Københavns Kommune, 2023b). For a city wanting to be amongst the leaders of sustainable growth, it is surprising how undetailed and prudent a climate plan can be. And for a city following a Doughnut Approach, it is surprising that, apart from the holistic communication and repetition about the societal justice within climate change, their climate action is so similar to that of other cities. And for all of these cities it is surprising how little actual information can be found within these documents. How many resources are being used? Are there specific cabinets responsible? How does one differentiate between marketing and climate action? The least that can be said is that whatever economic paradigm is being used, climate action is still subject to political and governance complexity and constraints.

8. Limitations

Just like any other study has this research been subject to its limitations. First of all is there the background of the researcher, who with a bachelor's degree in economics had to find their way in a new field of study, which besides possible strengths may have also caused weaknesses in the theoretical approach of this study. Furthermore is this city subject to visions present in Western society, and therefore possibly not applicable in different (economic) situations.

Next are there the limitations of the documents researched. Urban visions and climate action documents are policy materials subject to the institutional setting at the time of both writing and execution and are therefore vulnerable to alternations in the political landscape, influencing both execution, evaluation and possible follow-up plans. This is especially the case for long-term visions as they span several election periods. In this sense the 3-year climate action approach of Stockholm is more flexible, but also more vulnerable for changed long-term goals. However a discussion about the ideal scope and duration of a climate plan would be worth a separate paper.

An important note to make is that we were dependent on the availability of policy documents for the public. Inside knowledge and information within the cities' organisation might look different from what is presented to the outside world. Furthermore are the plans of Amsterdam and Stockholm still fairly new, and therefore it is difficult to perform any review on their results. This will also be a challenge for future projects, as it is already difficult to perform a full analysis of carbon offset efforts and the establishment of several obstacles, such as public opposition, lack of resources or other international crises can occur. In addition will an inclusion of the analysis of the social effects of the sustainability transition require an as holistic approach from the researcher as from the city. However, besides all these limitations is the analysis of planning documents still an important source for insights in the cities approach in the link between equity, sustainability and daily and future management (Hess & McKane, 2021 p.461).

Lastly could one ask the question whether the method of qualitative text analysis was the most suited for this research, and if there should not have been made a choice towards discourse analysis. Nevertheless is the choice for qualitative text analysis valid, based on the characteristics of the documents used. Discourse analysis is supposed to reflect norms and

thoughts through use of language and framing and asks questions about why specific words are chosen or how a text was produced. Whilst green solutions is definitely an element of city marketing, which is a topic that can be researched through discourse analysis, did this research require a more objective reading of the plan. This is due to the novelty of the topic of Doughnut Economics and the lack of previous studies on the influence of (economic) paradigms on urban climate approaches. Furthermore did the differences between the urban visions and the urban climate plans require a separate analysis, with a more thematic approach to set out the positioning of the cities towards the concept of Doughnut Economics before classifying its effect on climate action through an evaluative analysis. We still made use of normative elements in this classification and analysis and interpretated their meaning in a part of the analysis and the discussion part. However, we deem it scientifically more appropriate to have started our journey with a more objective foundation, making it possible to mark the field clearly before going into the deeper analysis of these policy documents.

9. Conclusion

In this paper we have, whilst using a qualitative text analysis, tried to investigate the influence of the concept of Doughnut Economics on urban visions and urban climate plans and whether following such approach leads to different outcomes. Without going to deep within a discourse analysis, does the content of these urban documents show a general idea towards the cities' preferred approach for urban climate visions and climate change action. When testing the urban visions of Amsterdam, Stockholm and Copenhagen to the principles of Doughnut Economies, we can see that two patterns of difference arise: whilst the 'Omgevingsvisie Amsterdam 2050' focuses on the complexity of climate change and urban challenges in general, presenting foundations for a just and sustainable societal change, do the city plans of Stockholm and especially Copenhagen present a vision of economic rationality, focusing on economic and physical growth, with the city as a passive concept and entity**,** only providing the basic necessities for urban life, out of which individual actors have to interact to create the desired societal outcome. These are some major difference on the road to tackle climate change and the major societal impacts it is expected to have.

However, these differences do not seem to get translated within the climate action plans in such a different manner. Whilst the city of Amsterdam indeed manages to translate the holistic Doughnut approach in their climate plans, again advocating for a just social transition with an eye for the needs of nature, the benefits of increased biodiversity and even the effects of its own consumption and decisions on outside and foreign actors, are the effective measures and goals included not that different from those of the cities of Stockholm and Copenhagen. However does the focus of the climate plans differ, with an increasing importance for economic growth, economic performance and private company involvement within Scandinavian climate action. Especially within the capital of Denmark we can see a significant decreased role of responsibility for the city and economic growth as the main reason for the engagement in climate change action.

In this paper we have asked ourselves the question whether following a Doughnut Economics approaches affects urban climate plans. When taking into consideration political, council specific and institutional differences, we can see that the Doughnut-following city of Amsterdam has a different approach towards urban visioning than cities embedded in the traditional economic framework. By promoting a more comprehensive tactic with eye for

possible innovative and society-changing futures, it is deviating from the more simplistic and target-driven approach which we have found within the climate action tactics of Copenhagen and Stockholm. Whilst individual city and national legislation characteristics can play a role in this difference, it is likely that following a Doughnut Approach can at least help cities keeping an oversight over the complexity of urban and climate governance, if not helping create a more solid base to secure a safe and just future. However, it is unclear in what sense this vision will be translated into actual action. This should not come as surprising, given the overlap of obvious climate measures in comparable cities.

Furthermore does the importance of economic growth and rationality come through in an unexpectedly high importance within the climate action efforts of the cities of Copenhagen and Stockholm. It is exactly against this dominance that alternative economic movements are protesting, arguing its enormous impact on climate change and the intellectual approach towards adaptation and mitigation. Taking into account the responsibility of private companies and traditional capitalist rationale and solutions, there is definitely a case for investigating possible alternatives. Nevertheless does the question remain whether Amsterdam's comprehensive Doughnut-based vision, which is also present in the argumentation its climate efforts will lead to a better implementation of the measures proposed, but considering the results our world has reached following a more financially rational approach, it would not be a bad idea to give this alternative framework the benefit of the doubt.

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Appendix

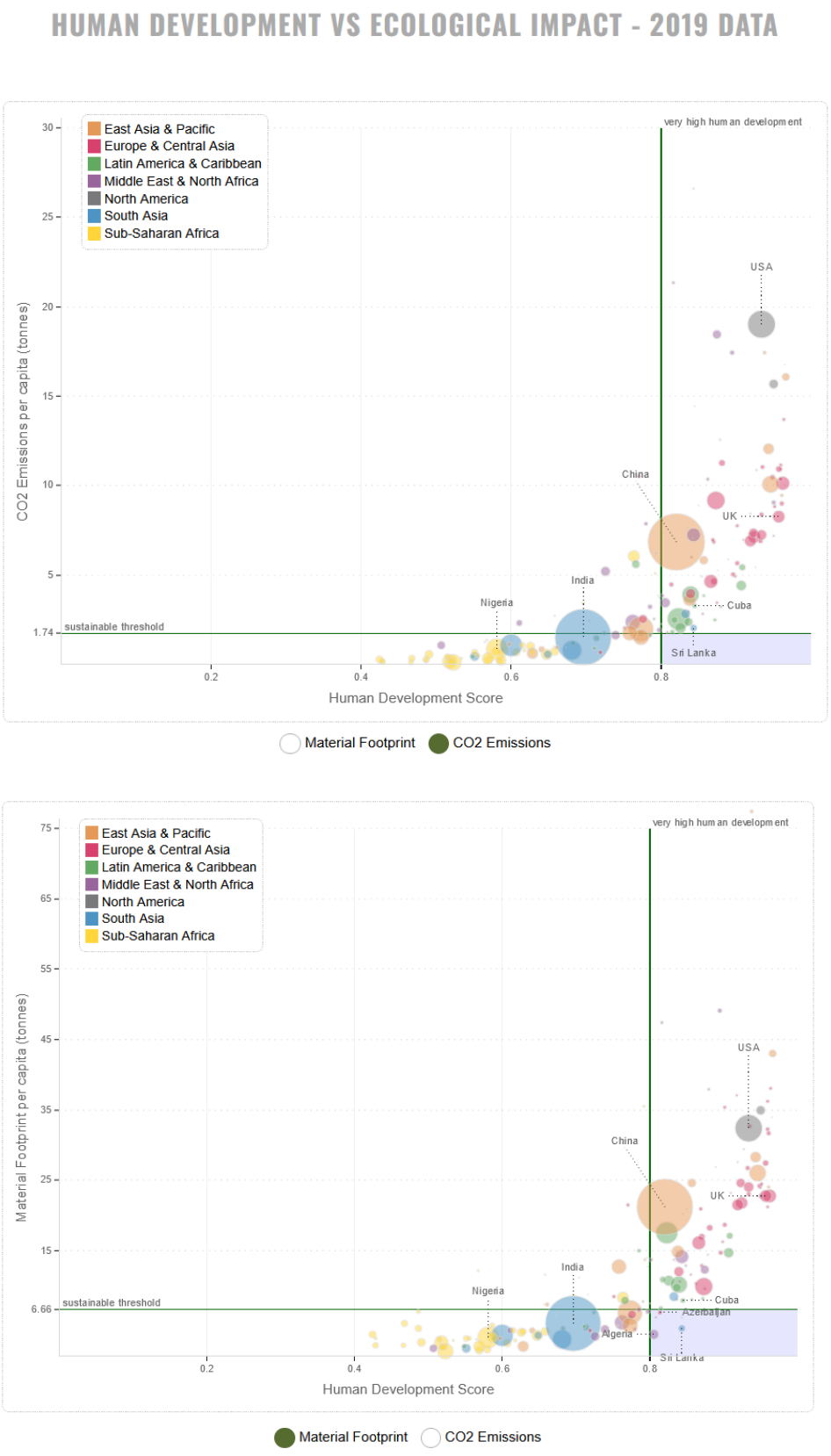

Figure 1: The SDI (Sustainable Development Index, n.d.)

- Weblinks to the policy documents used

Amsterdam

Omgevingsvisie Amsterdam 2050: https://amsterdam2050.nl/

Nieuw Amsterdams Klimaat – Routekaart Amsterdam Klimaatneutraal 2050: https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.klimaatakkoord.nl/binaries/klimaatakkoord/documenten/publicaties/2020/03/06/routekaart-amsterdam/F%2B-%2B01%2BDuurzaamheid%2Ben%2BCirculaire%2BEconomie%2B%252829%2529%2B1.%2BRoutekaart%2BAmsterdam%2BKlim.pdf&ved=2ahUKEwi006Xd4bKGAxXXExAIHdTHDOgQFnoECBEQAQ&usg=AOvVaw05VXmTtIlAnqFP-r-KGdiL

Onze stad van morgen – Duurzame toekomst stad Amsterdam: https://openresearch.amsterdam/nl/page/101052/onze-stad-van-morgen- --duurzame-toekomst-gemeente-amsterdam

Copenhagen

Verdensby med Ansvar – Kommuneplan 2019: https://www.kk.dk/politik/politikker-og-indsatser/bolig-byggeri-og-byliv/koebenhavns-kommuneplan

CPH 2025 Climate Plan: https://urbandevelopmentcph.kk.dk/climate

Stockholm

Stockholm City Plan: https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://vaxer.stockholm/siteassets/stockholm-vaxer/tema/oversiktsplan-for-stockholm/english_stockholm_city_plan.pdf&ved=2ahUKEwiznrmg4rKGAxVhLRAIHftWAGYQFnoECBUQAQ&usg=AOvVaw0cTb5zOEjJCdcDgoieun6e

Climate Action Plan 2020-2023 & Environment Programme 2020-2023: https://start.stockholm/en/about-the-city-of-stockholm/how-the-city-is-governed/climate-and-environment/

- **Analysis method**

  The next pages are a transcript of the textual analysis performed on the ‘Omgevingsvisie 2050’ (Gemeente Amsterdam, 2021a p.35-37), as well as the colour code used. They act as an example for the entire analysis of the documents used. Afterwards, the marked extracts were combined in their respective categories. The climate plans analysis followed the same approach, but needed an extra step where the findings were first grouped per city. This step was necessary in order to make one table for each city. Lastly, the categories were merged into one table where the cities were compared over each category.

- **Embrace the 21st Century Goal**

  Aim to meet the social needs whilst staying within the planetary boundaries.

- **See the big picture**

  Finance systems and their targets are not ought to dominate society.

  A well-organised society recognises the roles of all players in the economy: households, commons, markets and the state.

- **Nurture human nature**

  Improve and strengthen community networks and citizen participation.

- **Think in systems**

  Ensure space to experimentation, learning, adaptation and continuous improvement.

- **Be distributive**

  Create equity by using open design to ensure all contributors benefit from the created value.

- ~~**Be regenerative**~~

  ~~Use the cycles of the living world as much as possible: share, repair and be thoughtful about resource effieiency.~~

- **Aim to thrive rather than to grow**

  Growth cannot be a goal in itself.

  Be aware of the point where work could be done by others instead of increasing one's own size.

- **Be strategic in practice**

  Follow entrepreneurship without having voices being neglected. Be open yet integer.

  Encourage peer-to-peer inspiration.

- - **Economic Growth**

  Focus on economic expansion and GDP.

- ~~**Rational Behaviour**~~

  ~~Focus on the desire of utility (and thus financial) maximalisation~~

- **Sustainable Development Goals**

  Implementation of or inspiration from the Sustainable Development Goals within urban visions

- ~~**Extra**~~

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het einde van de vorige eeuw wordt duidelijk dat het beslag dat we op de planeet leggen tot uitputting van natuurlijke hulpbronnen leidt, en onherstelbare schade aanricht in ecosystemen waarvan we als mensen afhankelijk zijn. Globalisering betekent ook een steeds nauwere verwevenheid van steden, landen en werelddelen, met als gevolg een grotere kwetsbaarheid. De impact van het coronavirus op alle aspecten van onze samenleving legt dit haarscherp bloot. Deze internationale crisis brengt tegelijk een herwaardering voor de directe leefomgeving met zich mee. Duidelijk wordt hoe belangrijk de kwaliteit van buurten en de kracht van lokale netwerken zijn.

Toenemende ongelijkheid

De opkomst van de stedelijke kenniseconomie heeft de afgelopen jaren tienduizenden nieuwe banen gecreëerd in Amsterdam. Maar tegelijk is de sociaal-economische ongelijkheid toegenomen en is kansenongelijkheid groter geworden. We constateren dat de kernstad en de rest van de regio als het gaat om economische dynamiek en bevolkingssamenstelling uit elkaar groeien. Terwijl in Amsterdam en Haarlemmermeer het aantal banen explosief groeide, bleven andere delen van de metropoolregio achter. Verschillen tussen buurten binnen de stad namen toe en de steeds hogere huizenprijzen maakten het voor lagere en middeninkomens bijna onmogelijk om een plek in de stad te bemachtigen. Daarnaast neemt de bereikbaarheid van werk voor velen af en de reisafstand toe, terwijl investeringen in vooral openbaar vervoer achterblijven bij de groei van inwoners en banen.

Druk op de stad

De toename van bevolking, arbeidsplaatsen en bezoekers in Amsterdam verliep sinds 2010 veel sneller en was groter dan voorzien. In de Structuurvisie Amsterdam 2040 uit 2011 was de voorspelling dat Amsterdam in 2040 860.000 inwoners zou tellen. Dat aantal is in 2019 bereikt. Het aantal arbeidsplaatsen en bezoekers is zelfs nog sneller gegroeid dan het aantal inwoners, terwijl die groei in 2011 helemaal niet voorzien werd. Tegelijk moeten we constateren dat de meeste van de grote investeringen in openbare ruimte, groen, stedelijke voorzieningen en infrastructuur, die bij de structuurvisieambitie hoorden, niet zijn gedaan. Dat betekent dat de groei van inwoners, werknemers en bezoekers grotendeels opgevangen is door dezelfde voorzieningen en infrastructuur als tien jaar geleden. De druk op de stad liep hierdoor merkbaar op.

~~De groei heeft een grote impact op de inwoners en de leefkwaliteit in de stad~~. De ruimte wordt steeds schaarser. Dit heeft snelle prijsstijgingen van woningen als gevolg gehad. Kwetsbare groepen Amsterdammers profiteren lang niet altijd mee van het succes van de stad. Het toegenomen aantal bezoekers heeft zeer negatieve gevolgen voor de leefbaarheid in sommige delen van het centrum. Dit alles heeft consequenties voor de open en tolerante houding van Amsterdammers, en hoe zij de stad beleven.

De oplopende druk op de schaarse ruimte valt samen met nieuwe en urgente opgaven. Voorbeelden zijn de toenemende sociaal-economische en ideologische verschillen in de samenleving, de snelle technologische ontwikkeling en de vergrijzing. Allemaal hebben ze impact op de leefomgeving. De meest fundamentele nieuwe opgave vloeit echter voort uit de verandering van het klimaat en de noodzaak lokaal invulling te geven aan de energietransitie en de circulaire economie.

De kwaliteit van de stad, de ruimtelijke opbouw en de inrichting van de openbare ruimte is van grote invloed op de wijze waarop netwerken van mensen er gebruik van maken. Niet alle omgevingen nodigen in dezelfde mate uit tot ontmoeting en uitwisseling. De kwaliteit van het publieke leven is een van de redenen waarom juist vooroorlogse stadsdelen in Amsterdam zo populair zijn.

Amsterdam in het antropoceen

De invloed van de mensheid op de planeet neemt steeds verder toe. De in Amsterdam geboren Nobelprijswinnaar Paul Crutzen opperde als eerste de term 'antropoceen'. De invloed van de mens is vergelijkbaar met een geologische kracht en de effecten van onze soort op de planeet zullen over honderdduizenden jaren nog voelbaar zijn. De aantasting van het milieu heeft een steeds directer en doordringender effect op onze leefomgeving. De coronacrisis maakt dat duidelijk. Een besmettelijk virus springt op een markt over van dier op mens en in enkele maanden tijd wordt de hele wereld er door geraakt. De klimaatcrisis verloopt langzamer, maar is bedreigender en fundamenteler. Amsterdam ligt op een kwetsbare plek. Zeespiegelstijging, droogte en extreme neerslag en een dalende bodem bedreigen op langere termijn de bewoonbaarheid van heel laag Nederland.

Lokaal zijn de effecten van klimaatverandering al voelbaar: Nederland maakte in 2020 alweer een ongebruikelijk lange hittegolf mee, grote delen van ons land kampen met structurele droogte en extreem weer trekt een zware wissel op de leefbaarheid van dichtbebouwde steden. Er is terecht reden tot grote zorg en somberheid. De doelstelling de opwarming van de aarde tot 1,5 graad te beperken raakt steeds verder buiten beeld. Wellicht bereiken we het moment van 1,5 graad opwarming al vlak na 2030 en van 2 graden nog voor 2050. Dat is nog binnen de horizon van deze omgevingsvisie. Het overschrijden van de tweegradengrens zal leiden tot onbeheersbare wereldwijde klimaatproblemen, zoals hitte, droogte, overstromingen, misoogsten, en klimaatvluchtelingen.

Een toekomstbestendig Amsterdam overschrijdt de draagkracht van de planeet niet. Feit is dat we op dit moment al ver boven onze stand leven. Alleen al het aanpassen van de bestaande stad aan klimaatdoelen en extremer weer stelt ons voor enorme opgaven en kosten. Op termijn is een omschakeling op een grotendeels circulaire samenleving noodzakelijk. Dit heeft grote gevolgen voor de leefomgeving en de wijze waarop de stad zich ontwikkelt. In de circulaire stad is meer ruimte nodig voor energievoorziening en afvalverwerking. Dit betekent een extra ruimtevrager waar we in de verdichtende stad rekening mee moeten houden. Het opwaarderen van grondstoffen, lokale productie, het opslaan van energie vraagt om milieuruimte. Dat betekent dat mengen van deze activiteiten met wonen en werken niet vanzelfsprekend is.

Metropoolvorming

De ontwikkeling van onze stad is meer dan ooit verbonden met die van de rest van de regio en heel West-Nederland. Amsterdam bleek de afgelopen jaren een belangrijke trekker voor mensen, instellingen en bedrijven uit het buitenland. Amsterdam is sterk in de sectoren cultuur, creatieve industrie en media, fintech, ICT en lifesciences. Veel Nederlandse bedrijven groeiden in onze stad uit tot wereldspelers. Als gezegd houdt de Amsterdamse bevolkingsgroei de toename van de werkgelegenheid niet bij. Werknemers van Amsterdamse bedrijven wonen dan ook in de hele metropoolregio en ver daarbuiten. Ook Amsterdammers en nieuwkomers op zoek naar een groter of betaalbaar huis zoeken hun heil vaak buiten de stad. De druk op de schaarse ruimte in de stad en de stijgende prijzen leiden daarnaast tot een verdringing van bedrijven en functies die (milieu)ruimte nodig hebben. Distributie en opslag, industrie en grondstoffenverwerking, duurzame energieopwekking, datacenters en groothandels zijn onmisbaar voor Amsterdam. Ze zijn echter steeds vaker aangewezen op een plek buiten de stad.

De concentratie van werkgelegenheid en publieksvoorzieningen en gelijktijdige spreiding van inwoners en stadsverzorgende functies, betekent dat Amsterdam en de andere delen van de metropoolregio meer van elkaar afhankelijk worden. Deze integratie van de kernstad met de omliggende gemeenten is kenmerkend voor groeiende metropolen.

Het landschap heeft niet direct van de groei geprofiteerd, hoewel de waarde ervan buiten kijf staat. Voor de leefkwaliteit, maar ook voor biodiversiteit en voor opgaven als het bufferen van water, de productie van gezond en duurzaam voedsel en schoon drinkwater.

Desondanks is het lastig gebleken uithollende processen als bodemdaling, afname van biodiversiteit en versnippering te stoppen.

Gezamenlijke opgaven

Binnen de metropoolregio wordt de band met onze buren in de agglomeratie Amsterdam sterker. Zij hebben de afgelopen jaren duizenden woningen gebouwd, grotendeels voor de Amsterdamse vraag. Verscheidene grote projecten staan nog op stapel. Vaak liggen ze dicht tegen onze gemeentegrens aan. Ruimtelijk raakt het aaneengesloten stedelijk gebied van Amsterdam, Zaanstad, Amstelveen, Ouder-Amstel en Diemen vervlochten. In de groene scheggen Amstelscheg, Amsterdamse Bos, Diemerscheg en Waterland is de recreatieve druk toegenomen. Het maakt groei, beheer van groen, landschap en water en aanleg van infrastructuur tot een gezamenlijke opgave die vraagt om nauwe samenwerking binnen de agglomeratie.

Tegelijk ontstijgt de invloedssfeer van Amsterdam het schaalniveau van de metropoolregio. Een toenemend aantal van de Amsterdamse banen wordt ingevuld door inwoners van grote en middelgrote steden op afstand, zoals Rotterdam, Zwolle en Den Bosch. Ook de relatie met andere Europese metropolen is sterker geworden. Dat vraagt weer om samenwerking met het Rijk en de provincies. Lokale, regionale en (inter)nationale belangen vallen niet altijd vanzelfsprekend samen. Zo zijn snelle verbindingen tussen de centra van de grote steden belangrijker geworden. Maar snelle intercity's en internationale treinen concurreren op het spoor met lokale en regionale treinen. Een Amsterdamse inzet op autoluw en meer kwaliteit in de openbare ruimte staat op gespannen voet met de bereikbaarheid van de stad vanuit andere delen van de regio, waar de auto nog altijd het belangrijkste vervoermiddel is.

Samen maken we de stad, de regio en het land. Niet alleen binnen de metropoolregio en niet alleen binnen de Randstad. De Amsterdamse economie profiteert bijvoorbeeld van de link met het hightech-cluster rond Eindhoven, met universiteitssteden als Wageningen, Enschede en Groningen en hun specialistische onderzoeksinstituten en startende ondernemingen. De sterke afhankelijkheid, zoals die tussen

Nieuwbouw van woningen in de Houthavens. Sinds 2010 verrezen de meeste nieuwe woningen direct rond het centrum.

Amsterdam en de rest van de metropoolregio en enkele grotere steden bestaat, is in de verhouding tussen de hoofdstad en andere delen van Nederland minder evident. Voor sommige regio's lijkt Amsterdam eerder een magneet die talentvolle mensen wegtrekt en bovendien een stad die weinig gevoelig is voor wat er elders in het land speelt en wat er gedacht wordt. Toch horen Amsterdam en Nederland bij elkaar. We hebben elkaar nodig. Denk alleen al aan innovatie, energie, voedsel, de doorvoer van goederen, recreatie, natuur, waterveiligheid en defensie.

Mensen maken de metropool

Vaak kijken we naar steden als een verzameling van gebouwen en infrastructuur. Maar een stad bestaat allereerst uit mensen. De inwoners uiteraard, maar ook mensen die er dagelijks komen om te werken, te studeren of wekelijks om te winkelen of uit te gaan. Mensen die er eenmalig en kortstondig op bezoek zijn. Voor al deze mensen is de stad onmisbaar als plek om sociaal en persoonlijk te groeien, om je economisch te ontplooien, om te ontspannen en je te laten inspireren. Iedereen in