UPPSALA
UNIVERSITET

Master thesis in Sustainable Development 2018/29
Examensarbete i Hållbar utveckling

Tokyo: A Megacity that works? Policies, Planning and Sustainable Development Goal 11

Nicola Donohoe

DEPARTMENT OF
EARTH SCIENCES
INSTITUTIONEN FÖR
GEOVETENSKAPER

Master thesis in Sustainable Development 2018/29
Examensarbete i Hållbar utveckling

Tokyo: A Megacity that works? Policies, Planning and Sustainable Development Goal 11

Nicola Donohoe

Supervisor: Malin Hansen
Evaluator: Tigran Haas

Content

Tokyo: A megacity that works?

Policies, Planning and Sustainable Development Goal 11

Nicola Donohoe

Donohoe, N., 2018: Tokyo: A megacity that works? Policies, Planning and Sustainable Development Goal 11, *Master Thesis in Sustainable Development at Uppsala University*, 2018/29, 47 pp, 30 ECTS/hp

Abstract:
Sustainability has become highly prominent, it is an important aspect of the 21st century that is gradually becoming part of everyday life. Urbanisation has also rapidly increased since the 1950s when New York was the only urban area in the world to be considered a megacity due to its extensive population; presently megacities can be found globally with predicted to arise in the future. The growth rate of some of the largest urban areas in the world has been too rapid for some cities to keep up with; resulting in environmental, social, and economic issues growing alongside the urbanisation trend. The implementation of the Sustainable Development Goals (SDGs) wants to work towards reducing and eventually removing such issues at a global scale; reducing the inequalities of the world that are more than often to visible in large urban areas. This thesis aims to examine the SDGs, specifically that of SDG 11 which focuses on cities and human settlements in line with one of the largest urban areas on the planet, Tokyo. An examination of planning and policy documents composed by the Tokyo Metropolitan Government (TMG) in the form of a comparative analysis alongside key criteria taken from SDG 11 will be conducted to gain an insight and understanding of the plans and policies that are working to create a functioning society in Tokyo.

Keywords: Megacity, Inclusive, Safe, Resilient, Sustainable, Policies

Nicola Donohoe, Department of Earth Sciences, Uppsala University, Villavägen 16, SE-75236 Uppsala, Sweden

Tokyo: A megacity that works?

Policies, Planning and Sustainable Development Goal 11

Nicola Donohoe

Donohoe, N., 2018: Tokyo: A megacity that works? Policies, Planning and Sustainable Development Goal 11, *Master Thesis in Sustainable Development at Uppsala University*, 2018/29, 47 pp, 30 ECTS/hp

Summary

In 2015, leaders of 193 countries of the world came together in a bid to face the future, endorsing 17 Sustainable Development Goals (SDGs). 17 Goals aiming to create a shift towards putting the world on a sustainable path; a shift for people and the planet on shared values, principles and priorities. The SDGs are a universal call to end poverty, protect the planet and ensure that all people enjoy peace and prosperity with the targets set to be achievable, realistic and adaptable to different priorities at a global scale.

A core global concern is urbanization, a significant cause of world-wide growth of vulnerability to hazardous environmental processes; urbanization is a density of human structures such as houses, commercial buildings, roads, bridges, and railways. Urban areas can refer to cities, towns or suburbs and with the rapid growth of urbanization the largest of today's urban area, 'megacities', have come about. Areas with a population in excess of 10 million, a large area that should be safe and sustainable. As more and more people continuously pour into cities that are already exposed to significant physical risks, pushing against the limits of environmental and social-technical systems. The rapid growth of cities and megacities is changing urbanization dynamics and calling for a reassessment of urban governance. Yet, even with vast disparities between wealth and poverty; cities remain among the most attractive and exciting places to live.

This thesis aims to gain knowledge and insight into megacities by examining policy documents implemented being implemented, focusing specifically on Tokyo. Alongside key criteria and targets taken from Sustainable Development Goal 11: Make Cities and human settlements inclusive, safe, resilient and sustainable, Perceived as a set of guidelines, to be interpreted in terms of the needs of Tokyo, working towards a more sustainable and equitable future. With the final purpose being to form a comparative analysis of the different policy documents and SDG 11 initiatives to assess the progress made so far in achieving Agenda 2030.

This research corroborates alongside previous research that has been conducted into urbanization and megacities; however, as trends increase constant updates of information is needed to gain a better understanding into the future of global megacities.

Keywords: Megacity, Inclusive, Safe, Resilient, Sustainable, Policies

Nicola Donohoe, Department of Earth Sciences, Uppsala University, Villavägen 16, SE-75236 Uppsala, Sweden

“We are the first generation that can put an end to poverty and we are the last generation that can put an end to climate change.”

“Cities are where the battle for sustainable development will be won or lost.”

United Nations Secretary General

Ban Ki-Moon, Before adoption of

the SDGs & The New Urban Agenda

1. Introduction

1.1 Urbanisation and Megacities

An urban area is the region surrounding a city, with most urban areas being very developed; a density of human structures such as houses, commercial buildings, roads, bridges, and railways (National Geographic, 2018) Among the largest of today's urban areas are what is known as "megacities", 'a metropolitan area with a total population in excess of 10 million. It can be a single metropolitan area or two or more metropolitan areas that converge' (Anneroth et al, 2012) Urban areas can refer to towns, cities, and suburbs, the variety of human settlements around the globe. Half of humanity, 3.5 billion people live in urban areas with 95% of this urban expansion taking place in the developing world. Yet, the world's cities occupy just 3% of the Earths land, but account for 60-80% of energy consumption and 75% of carbon emissions (UN, 2018)

Urbanisation is one of the most important causes of world-wide growth of vulnerability to hazardous environmental processes. 'Material investments and people are pouring into cities that are already exposed to significant physical risks, which are pushing against the limits of environmental and social-technical systems' (Parker, 1995, P.164) In terms of megacities, they are becoming the key to global urbanisation, changing its dynamics, and calling for a reassessment of urban governance; the challenges facing megacities are gradually becoming a growing concern. Megacities should be safe and sustainable, as central hubs of trade, culture, information, and industry that hold an enigma of power (UN-Habitat, 2006) Cities, however contain vast disparities between wealth and poverty yet are also considered the heart of our civilization, the primary source of wealth and enterprise, places of inspiring architecture and the great centres of learning, culture, and politics (Evans et al, 2005)

Nonetheless, the rapid and chaotic nature of urbanisation has increasingly made cities sites of poverty, inequality, environmental degradation, and the violation of human rights (UN-Habitat, 2006) Even with such negative connotations and the congested complexities of megacities, they are still among the planets most exciting places to live and have proven to stimulate creativity, innovation, freedom, and economic development. These opportunities often offer improved quality of life, further increasing the urbanisation trend. Therefore, having a basic understanding of the management plans or policies and future outcomes, a need to continue to explore how best we can work with our cities; bringing new ways of thinking in terms of the development of a city. If a megacity is managed properly it has the potential to reduce poverty and improve living conditions for a large proportion of the population (Anneroth et al, 2012)

Research has previously been conducted into megacities and urbanisation, however as trends increase more information is required to gain a better understanding in to the future of global megacities. Management and planning policies need to be developed further through risk assessment, urban planning, sustainability and more. Risk within cities has increased as 'distinctions between natural and disasters and ones which may be described as technological or industrial are becoming increasingly blurred' (Parker, 1995) With clearly implemented policies risk can be reduced and the safety, sustainability, resilience, and inclusivity of megacities can be increased; creating a higher quality of life. In some cases, a reassessment of urban governance may be needed to gain a clearer perspective as to the specific needs of individual urban areas. According to Glaeser, the failures of urban renewal reflect a failure at all levels of government, that some places may get left behind; not all cities will succeed

because not every city has been adept in adapting to the age of information (2012) Gaining knowledgeable insight into megacities is important so that no city gets left behind, and all are given the opportunity to succeed in a safe and sustainable manner.

1.2 Thesis Objective

The overall objective of this thesis is to gain knowledge and insight into a specific global megacity, primarily focused on specific policy documents implemented in this megacity. With key criteria and targets taken from Sustainable Development Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable; to be used as a set of guidelines towards a more sustainable and equitable future. With the main purpose being to develop a comparative analysis of different policy documents and SDG 11 initiatives to assess progress made so far towards achieving SDG 11.

Sub-questions will be considered throughout the thesis to gain a clearer answer to the overall objective described here above including the following: Is it possible for such a large metropolitan area to manage itself and function comfortably? What are the successes and achievements of the various set goals or targets?

1.3 Sustainable Development Goals and Tokyo

Replacing the Millennium Development Goals (MDGs) that started a global effort in 2000 specifically tackling poverty; for over 15 years the MDGs pushed for progress in various areas of importance related to poverty, access to water, child mortality and more.

In 2015, the MDGs were replaced by the Sustainable Development Goals (SDGs) at the United Nations Conference on Sustainable Development in Rio de Janeiro (UNDP, 2018) Nonetheless, it is from the success of the MDGs that the SDGs came about as they provided valuable insight, experience, and knowledge to create new goals. These 17 new goals are an important shift towards putting the world on a more sustainable path with significant emphasis being placed on the interconnectedness of the SDGs; the success of one goal can affect the success of others. The SDGs coincided with other historic agreements that was reached in 2015 at the COP21 Paris Climate Conference and the Sendai Framework for Disaster Risk Reduction signed in Japan on March 2015. These agreements set targets to reduce carbon emissions, manage climate change related risks and natural disasters and to build back better after a crisis (UNDP, 2018) All goals are set with the idea of inclusivity, that all of humanity should be considered equally in creating a more prosperous, sustainable planet.

The SDGs are a universal call to end poverty, protect the planet and ensure that all people enjoy peace and prosperity with the targets set to achievable, realistic, and adaptable to different priorities within different megacities. The SDGs came into effect in January 2016 and continue to guide the United Nations Development Program (UNDP) with policies and funding for the next 15 years (UNDP, 2018) The UNDP offers support to governments with integrating the SDGs, while requiring partnership of governments, private sectors, civil society, and citizens. SDG 11 is therefore a key part for the implementation and accomplishment of sustainable agendas.

1.4 Thesis Outline

Comprised of six chapters, including that of the introduction the outline of this thesis is as follows. Chapter two focuses on background information, forming an introduction to the foundation of various sections. Introducing the Sustainable Development Goals and Tokyo that will be further discussed throughout the thesis. Chapter three explains the methodology

employed for this study, including a general overview, an introduction to the case study and limitations within the study area. Chapter four introduces the key criteria taken from SDG 11, an examination of literature related to the focus of this thesis; introducing the city, megacity, and megalopolis urban structures of the world. Chapter five is an examination of the overall results taken from this study. While chapter six brings the discussion and conclusion section, a discussion of the policies taken from Tokyo and SDG 11; an over-all discussion of the thesis in general, its results and the future of global urban areas.

2. Background

The following chapter will discuss the Sustainable Development Goals (SDGs), focusing on SDG 11, the progress of SDG 11 and introduces the metropolitan area of Tokyo.

2.1 Sustainable Development Goals

In the year 2015, leaders from 193 countries of the world came together to face the future, and what they saw was daunting. Famines. Drought. Wars. Plagues. Poverty. Not just in some faraway place, but in their own cities and towns and villages. In the hope for a better future these leaders created a plan known as the Sustainable Development Goals (SDGs), this set of 17 goals imagined a future just 15 years off that would be rid of poverty and hunger and safe from the worst effects of climate change. (UNDP, 2015) An ambitious plan, the 17 goals take a bold and transformative step in shifting the world towards a more sustainable and resilient path; consisting of 169 targets set to demonstrate the scale and ambition of this new universal agenda. Utilizing it to the full to transform the world for the better by 2030 (Sustainable Development Knowledge Platform, 2015)

2.1.1 SDG 11: Make Cities Inclusive, Safe, Resilient and Sustainable

It is expected that by the year 2050, 6.5 billion people will live in urban areas, two thirds of humanity; therefore, global sustainability will not be completely achieved without transferring the way we build and manage urban spaces. More than half of the world's population lives in cities and urban population is only expected to increase by 70% meaning that the number of new urban settlements that will need to be built will be equivalent to that of the history of humanity (Fabre, 2017) At the current rapid growth of cities with increasing rural to urban migration it is leading to a boom in megacities globally; in 1990 there were 10 megacities with 10 million inhabitants or more and by 2014 there was 28 megacities home to 453 million people and this is only expected to increase. (UN, 2014) Even though the world's cities occupy just 3% of the Earth's land, they account for 60-80% of global energy consumption and 75% of carbon emissions which only further emphasises the importance of SDG 11. (UN, 2018) Rapid urbanisation is exerting pressure in megacities as they struggle to accommodate a rapidly growing population; with SDG 11 in mind the targets set are achievable and adaptable to the different needs of different megacities. SDG 11 consists of several targets and indicators providing a framework towards achieving sustainable goals, see table 1.1 below.

Table 1.1 Sustainable Development Goal 11 targets and indicators

	Targets		Indicators
11.1	By 2030, ensure access for all to adequate, safe, and affordable housing and basic services and upgrade slums.	11.1.1	Proportion of urban populations living in slums, informal settlements, or inadequate housing.
11.2	By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving	11.2.1	Proportion of population that has convenient access to public transport,

	road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.		by sex, age, and persons with disabilities.
11.3	By 2030, enhance inclusive and sustainable urbanisation and capacity for participatory, integrated, and sustainable human settlement planning and management in all countries.	11.3.1 11.3.2	Ratio of land consumption rate to population growth rate. Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically.
11.4	Strengthen efforts to protect and safeguard the worlds cultural and natural heritage.	11.4.1	Total expenditure (public and private) per capita spent on the preservation, protection, and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed, and world heritage centre designation), level of government (nation, regional, and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector, and sponsorship)
11.5	By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.	11.5.1 11.5.2	Number of deaths, missing persons and persons affected by disaster per 100,00 people. Direct disaster economic loss in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services.
11.6	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.	11.6.1 11.6.2	Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated by cities. Annual mean levels of fine particulate matter (e.g. PM 2.5 and PM 10) in cities (population weighted)
11.7	By 2030, provide universal access to safe, inclusive, and accessible, green, and public spaces, for women and children, older persons, and persons with disabilities.	11.7.1 11.7.2	Average share of the built-up area of the cities that is open space for public use for all, by sex age and persons with disabilities. Proportion of persons victims of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months.
11.A	Support positive economic, social, and environmental links between urban, per-urban, and rural areas by strengthening national and regional development planning.	11.A.1	Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city.

11.B	By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters and develop and implement in line with the Sendai Framework for Disaster Risk Reduction 2015 – 2030, holistic disaster risk management at all levels.	11.B.1 11.B.2	Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015 – 2030. Number of countries with national and local disaster risk reduction strategies.
11.C	Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local material.	11.C.1	Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient, and resource-efficient buildings utilizing local materials.

2.2 Tokyo – Geographic Information

Tokyo metropolis is in the southern Kanto region, bordered to the east by Edogawa river and Chiba prefecture, to the west by mountains and Yamanashi prefecture, to the south by the Tamagawa river and Kanagawa prefecture and to the north by Saitama prefecture. (TMG, 2018) Figure 2.1 below shows the location of Tokyo in Japan, along with the surrounding prefectures of the metropolis area which is specifically made up of the three neighbouring prefectures: Saitama, Chiba, and Kanagawa. An area that is home to 30% of the total population of Japan. (TMG, 2018)

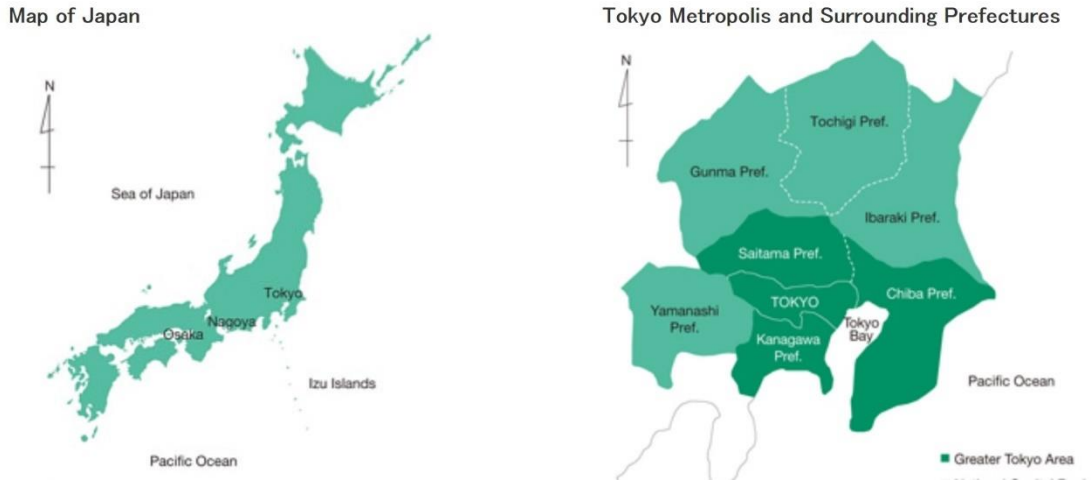


Figure 2.1 Map of Japan including the Tokyo metropolis and surrounding prefectures

While the national capital region is made up of Tokyo and the seven surrounding prefectures of Saitama, Chiba, Kanagawa, Ibaraki, Tochigi, Gunma, and Yamanashi; Tokyo metropolis comprises of special wards and municipalities. The 'central' area is divided into 23 special wards, known as 'Ku' in Japanese and the Tama area is made up of 26 cities (Shi), 3 towns (Machi) and 1 Village (Mura). Tokyo consisted of a top-down cultural control during the Edo period, it's class structure is still culturally visible today. A brief history of Tokyo and

specific historical events and dates can be found in the appendix below. The pyramid looked like this: on top, the samurai (shi), under this, the farmers (no), below them the artisans (ko) and at the bottom, the merchants (sho). (Richie, 2010) This is like the current division of the cities, villages, and towns of Tokyo today with the upper layer or samurai culture containing what many foreign visitors consider Japaneseness. Together these two areas form a long, narrow stretch of land, running about 90 kilometres east to west and 25 kilometres north to south. (TMG, 2018) Both the Tama area and the 'central' area can be seen in figure 2.2 and 2.3 below.

Figure 2.2 Map of the 23 special wards

Figure 2.3. The cities, towns, and village of the Tama area and the 23 special wards

The Izu Islands and the Ogasawara Islands located in the Pacific Ocean are also administrative parts of Tokyo even though they are geographically separated from the metropolis. The 23 special ward area is the political, economic, and cultural hub of Japan with government offices, corporations and commercials facilities are concentrated in the heart of Tokyo. It is an area with numerous cultural facilities such as museums and art galleries, as

well as sightseeing and entertainment facilities meaning it is an area bustling with large numbers of visitors. (TMG, 2018)

The geographic location of Japan, Tokyo puts it in a vulnerable position on top of part of the Ring of Fire; a string of volcanoes and sites of seismic activity, located around the edge of the Pacific Ocean. Around 90% of all earthquakes occur here and the ring is dotted with 75% of all active volcanoes on Earth. 'The island nation of Japan lies along the western edge of the Ring of Fire and is one of the most tectonically active plates on Earth. As much as 10% of the world's volcanic activity takes place in Japan' (National Geographic, 2018) It is the Philippine Sea Plate (PSP) that subducts beneath the Tokyo Metropolitan area and was the source of the Genroku earthquake of 1703 (8.0 Magnitude) and the Kanto earthquake of 1923 (7.9 Magnitude) (Sato et al, 2005) As will be discussed later in this thesis this puts safety as top priority for the citizens and infrastructure of Tokyo. 'An earthquake with a magnitude of 7 or more in this region has the potential to produce devastating loss of life and property with even greater global economic repercussions' (Sato et al, 2005, P.462)

One of the most liveable areas of Tokyo is known as Yanaka which means 'in the valley', lying between the heights of Ueno and the slopes of Hongo; it's geographic location helped to determine its future as it avoided both the 1923 Kanto earthquake and the 1945 firebombing of Tokyo. Today it has remained one of the most liveable sections of Tokyo, with lots of greenery, low rents, intact neighbourhoods, small shops, a true hamlet ambience. 'It is also one of the best-preserved sections of village-Tokyo and staunchly holds its own against the march of progress' (Richie, 2010, P.50) This a prime example of a beautiful, harmonious area hidden within the metropolis of Tokyo; it demonstrates that tranquillity and a sense of community can exist in such a populous part of the world.

3. Methodology

The following chapter focuses on the methodology used for this thesis through a discussion of the general framework and introduces the chosen case study along with any limitations encountered.

3.1 General Framework

For this research, thematic analysis was partially adopted when it came to examine and analyse the three TMG documents alongside the criteria taken from SDG 11. This involved a thorough examination of each document to extract information, gain a clearer insight to their plans and policies so that similar themes, that of the four criteria can be distinguished. Evaluation research involves the evaluation of social and organisational programmes; Bryman writes that the essential question asked when it comes to evaluation research is if the intervention, such as a new policy initiative has achieved its anticipated goals (2012) Essential to this research, which evaluates different policy initiatives and progress achieved in relation to the set out future goals; in this case it is the initiatives and policies set out by the TMG in Tokyo in comparison to SDG 11.

3.2 Data and Analysis

The methods for collecting information and empirical data for this case was done through the literature review and document studies. Secondary data was collected through online libraries, academic databases, and governmental websites; the three core documents used were taken from the Tokyo Metropolitan Government websites. The three core documents, alongside Sustainable Development Goal 11 include the following:

- Creating the Future: The Long-Term Vision for Tokyo
- New Tokyo. New Tomorrow. The Action Plan for 2020
- Creating a Sustainable City: Tokyo's Environmental Policy

A thematic analysis was conducted of all three documents with the key criteria which formed the themes to be analysed taken from SDG 11: Inclusive, Safe, Resilient and Sustainable. The plans and polices were examined with these four criteria in mind.

A comparative analysis was then conducted once the themes were recognised, comparing all three documents and SDG 11. This will be presented later in Table 5.6, portraying each of the three documents, there similar themes with each other and with SDG 11 alongside each other.

3.3 Case Study

The research methods adopted for this thesis are that of an examination of a single case, a specific case study research; 'a case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real life context, especially when the boundaries between phenomenon and context are not clearly evident' (Farquhar, 2012, P. 5) A thorough examination of a specific megacity or metropolis' policies will be conducted in order to gain a better understanding and knowledge of what makes such a largely populated area function. It is an evaluation of specifically chosen policies alongside Sustainable Development Goal 11; a collection and analysis of data also based on previous experience and knowledge. The examination of one case study allows for the research to look in depth at a specific topic of interest and evaluate accordingly. Bryman writes that the essential question

asked when it comes to evaluation research is if the intervention, such as a new policy initiative has achieved its anticipated goals (2012) A question central to this research with the examination of a megacity or metropolis policies and the progress or even success of such policies in achieving its anticipated goals. Stake for example envisions case study research in the following way; 'we enter the scene with a sincere interest in learning how (actors) function in ordinary pursuits and milieus and with a willingness to put aside many presumptions while we learn' (Farquhar, 2012, P.6) In terms of this study it is an interest in learning how megacity's or metropolis' function and thrive while putting aside the many negative connotations presumed when it comes to urbanisation and sustainability. To gain an insight into the workings of the urbanisation trend, especially some of the world's largest urban areas with populations that exceed the size of some countries; the research conducted for this thesis will focus on one such urban area. The examination and evaluation of one area allows for the research to be done more in depth in terms of specific policies within one megacity or metropolis area. Therefore, Tokyo, the largest global urban area was chosen for this research.

3.3.1 Tokyo Profile

- Capital of Japan
- Population of Prefecture - 13.5 million
- Population of Metropolis area – 37.8 million
- It is the seat of the Emperor of Japan
- Area (2015) – 2,191km2
- Greenery (2015) – 50.5%
- There is still farmland close to downtown Tokyo
- The Ogasawara Islands are a World Natural Heritage Site
- Final Disposal amount of waste (2014) – 1.06 million tonnes
- Energy Related CO2 emissions (2015) – 58.9 million CO2 tonnes

The image below depicts the density and endless skyline of the city Tokyo, demonstrating its sheer vastness as one of the world's largest urban areas.

Image 1. Tokyo and its extensive skyline

3.4 Limitations

Although all documents used and examined throughout this thesis from the Tokyo Metropolitan Government were available in English, they were described as simplified versions in comparison to the original Japanese documents. Therefore, the original versions may be of more detail and hence contain more information that is just briefly written in the simplified English versions. A language barrier is existent here as only the English

documents were able to be examined for this research and may therefore lack information to be found in the original Japanese versions.

Time is a constraint in terms of this research the Sustainable Development Goals have constant online updates as to what is happening regarding them around the world and the information available and detailed. Each target from SDG 11 goes into detail and takes a lot of time to analyse individually rather than as a collective whole as was done here.

4. Literature Review

The following chapter focuses on the urban areas of cities, megacities to metropolis, SDG 11 and the key concepts taken from it.

4.1 Cities, Megacities and Metropolis

Cities have been and are a primary arena where change is taking place; as the world continues to transform, so have urban areas. 'While cities face major problems from poverty to pollution, they are also powerhouses of economic growth and catalysts for inclusion and innovation. With vision, planning and financing, cities can help provide solutions for the world' (UN Habitat, 2016) Therefore, urbanisation can be a positive force to be reckoned with once the growth and development is managed properly as 'uncontrolled growth, lack of regulations and institutions are often key instruments in a model for urbanisation becoming highly unsustainable' (UN Habitat, 2016) For the first time in history, in 2008, urban population outnumbered rural population, with a new urban agenda for cities and human settlements should be aware and therefore become more prepared for possible challenges that may occur. 'The new urban agenda should promote sustainable cities and human settlements that are environmentally sustainable and resilient, socially inclusive, safe and violence-free, economically productive and better connected to and contributing towards sustained rural transformation. This is in line with the 2030 agenda for Sustainable Development, especially Goal 11: to make cities and human settlements inclusive, safe, resilient and sustainable' (UN Habitat, 2016, P.2)

The world's largest known urban areas are known as 'megacities', each megacity holds more than 10 million people; back in 1950 it was only New York city who held such a distinction. (Kalan, 2014) But how the world has changed with over half of humanity living in cities today, in cities that were not prepared to handle the sudden and rapid population growth; 'although urbanisation has the potential to make cities more prosperous and countries more developed, many cities all over the world are grossly unprepared for the multidimensional challenges associated with urbanisation' (UN Habitat, 2016, P.5) It is for this reason that good governance is key to the success of any city, or in this case megacities or extensively large metropolitan areas such as Tokyo. According to the 2016 World's City Report cities that are sustainable, resilient, and inclusive should encompass the following basis:

- Strong effective leadership
- Land use planning
- Jurisdictional Coordination
- Inclusive citizen participation in the design of infrastructure
- Efficient financing that helps faster urban responses to climate change (UN Habitat, 2016, P.2)

The problem, however, with urban development, argued in a 2011 Forbes article is that 'megacities in developing countries should be seen for what they are; a tragic replaying of the worst aspects of the mass urbanisation that occurred previously in the west' (Kotkin, 2011) Nonetheless, as will be discussed below, Westernisation has played as a major influencer in many developed and developing countries or cities; if anything it is something that can be learned from and adapted if needed. 'But emphasising megacities' economic, social and environmental problems discounts the fundamental opportunities they provide and the enormous capacity their residents possess' (Kalan, 2014, P.70) The understanding and perception of large metropolis areas or megacities is incomplete, it is as with almost everything only the negative aspects that are seen and acknowledged. This perception needs to be changed, a greater understanding as to what makes a large urban metropolis function or

even considered liveable needs to be achieved. Nonetheless, a new category of megacities is emerging, dwarfing anything that has come before; 'the defining feature of this new urban age will be megalopolises whose populations are measured in the tens of millions, with jagged skylines that stretch as far as the eye can see' (Khanna, 2010)

Is the age of nations over? Has the new urban era begun in an age that appears increasingly unmanageable, have cities rather than states become islands of governance? (Khana, 2010) Many of these cities are world capitals that have grown into these large megacities or metropolis areas, of almost unimaginable scale; 'Cities are humanities greatest creation. They represent the ultimate handiwork of our imagination as a species and testify to our ability to reshape the natural environment in profound and lasting ways. Cities compress and unleash the creative urges of humanity. They are the places that over the course of five to seven millennia, have generated most of our art, culture, commerce and technology' (Kotkin, 2005, P.17) 'Our ability to reshape the natural environment' is that something humanity should be proud off? Given the environmental degradation of the world, the loss of biodiversity, the rapid use of natural resources and the fact that cities account for 60-80% of energy consumption and 75% of global carbon emissions; how are they one of humanities greatest creation? (UN, 2018) Yet, cities have the potential to be great, they are 'important drivers of development and poverty reduction in both urban and rural areas, as they concentrate much of the national economic activity, government, commerce and transportation and provide crucial links with rural areas' (UN, 2014) Potential can always drive people, to reach the possibility of a sustainable, resilient, safe and inclusive city for all; the possibility of a higher quality of life.

4.2 SDG 11: Key Concepts

4.2.1 Inclusive

Cities are sites of innovation, opportunity and diversity, yet they are also sites of inequality, deprivation and exclusion; 'they world is not only divided by differentiated access to opportunities, consumption, public spaces and services, education, technology and employment, but increasingly by access to income. There is an urgent need for new planning visions, strategies, policies, and tools that can transform our planet of cities into a planet of inclusive cities' (UN Habitat, 2016, P.69) As with SDG 11, inclusivity is an important aspect in developing a sustainable city with the functionality and survival rate of a city deteriorating with gender disparity, deteriorated living conditions, social exclusion, and marginalization. Learning to co-exist together is part of urbanisation, as cities feature high densities of people, this high density also forces people of different religions, nationalities, ethnicities, and sexual orientations to live and work alongside each other and in doing so they get to know the other, leading to a cosmopolitan respect of differences. (UN Habitat, 2016) Nonetheless, these forms of exclusion are not new, but the fact that a majority of the global population now consider themselves urbanites; it is putting people from different cultures, religions, economic backgrounds and more together. The gap between rich and poor is visible in many cities and is widening at a global scale; 'with more than two thirds of the world's population living in cities that are more unequal today than 20 years ago. (UN Habitat, 2016) If inequality is more prominent today than 20 years ago then what has been achieved in cities? How are people still attracted to moving into urban areas that are unable to provide equal opportunity for all? Space, more than often it is large urban metropolis areas of high density that lack space creating exclusion in different forms; 'to many cities today fail to make sustainable space for all, not just physically also in the civic, socio economic and cultural dimensions attached to collective space' (UN Habitat, 2016, P.73) Efficient use of space, not just physical space but sociocultural or political space is necessary for an inclusive city.

4.2.2 Safe

Insecurity and increasing risk are major urban concerns with rapid urbanisation growth and the effects of globalization having only enhanced risk within urban areas. These risks relate to crime and violence, health, natural and man-made disasters and more; such risks are unsustainable and unattractive qualities for a city. Health risks may increase due to inadequate infrastructure and services, resulting in the spread of disease; while an increase in crime creates a sense of fear and discomfort. It would result in the creation of an urban space in which people would not want to reside or raise a family as they would not feel like they were in a safe or secure environment. 'Cities are increasingly becoming targets of terrorism as they provide high levels of visibility and impact because of their social, political and economic centrality' (UN Habitat, 2016, P.23) The overall high-density of a city in terms of both population and space, its vast easily visible infrastructure leaves a city, especially one as large as a megacity open to more attacks; cities are places of vulnerability. Large public facilities are open to attack, they almost have a target on them when it comes to terrorist attacks as the cost of security for facilities such as schools, shopping centres, hotels and more is expensive; therefore, in most cases such security is lacking. Attacks on such facilities not only causes a severe loss of life but also impacts the surrounding areas infrastructure thus impacting the social and economic factors of an area. For example. 'the attack on New York in 2001 left 3,500 people dead but also damaged about 2.8 million square metres of office space and the Post Authority Trans-Hudson train station of the World Trade Centre' (UN Habitat, 2016, P.23)

4.2.3 Resilient

Resilience is a key word when it comes to urbanisation and SDG 11, therefore the development of urban resilience is essential in creating a sustainable city. 'Resilience refers to a city's capacity to cope with disasters, including the ability to address the structural factors underpinning vulnerabilities and to build more sustainable communities' (UN Habitat, 2016, P.90) Thus the UN office for Disaster Reduction (UNiSDR) has developed the City Resilience Action Plan (CityRAP) This action plan is aimed at fast growing small and medium sized towns or cities in a bid to overcome their lack of capacity, experience, information and resources; a kick start to resilience from the beginning. As a city grows, having a resilient action plan from the beginning one that can be learned from and developed further as the needs of the city change. Rapid population growth which has resulted in the number of global megacities increasing, only means that the development of a resilient action is even more required. The development of resilient infrastructure to protect the inhabitants of a city and sustain it more economically in terms of not having to constantly rebuild after sudden disasters but create long lasting infrastructure that is reliable and can leave a legacy for future generations to come; 'Resilient infrastructure and services may not come cheap, but unit costs decrease as urban density rises and the benefits remain significant' (UN Habitat, 2016, P.91)

4.2.4 Sustainable

Sustainable development became prominent in the early nineties, with different countries having different environmental concerns or in the case of this thesis it is different urban areas with different environmental concerns. There is no singular definition or understanding of the whole idea; 'we view sustainability as an ideal end state. Like democracy, it is a lofty goal that can be expressed in many ways, and whose perfect realisation eludes us. For this reason, there will always be competing definitions of sustainability' (Fuller, 2001, P.2) Sustainability, no matter the definition should always incorporate the social, economic and environmental as one whole positive ideal towards a better way of living. It is for this reason

that the management of a megacity or urban metropolis need 'just' sustainable polices. Good global and effective environmental governance is practically required in achieving a sustainable city; 'ensuring justice and equity in the process of environmental planning and management is crucial towards a just and sustainable city' (UN Habitat, 2016) According to the UN 2016 World Cities Report, previous experience helped create four pillars when working towards just sustainable policies, as can be seen in figure 4.1 below.

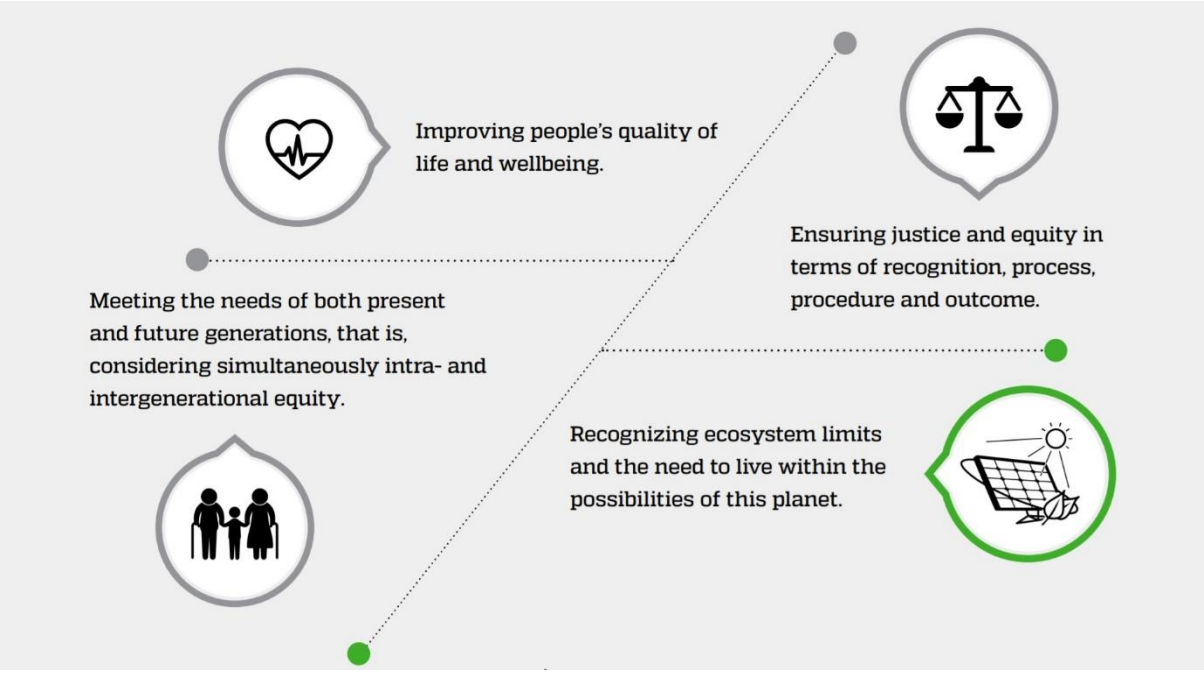


Figure 4.1 Four pillars towards sustainable policies

Is it possible to turn urbanisation and environmental sustainability into a workable challenge, the transformative role urbanisation can play in environmental sustainability is increasingly being recognised; along with well-planned management and building design and transportation. 'Urbanisation is integrally connected to the three pillars of sustainable development: economic development, social development and environmental protection. The outcome of the Rio+2- United Nations conference on Sustainable Development, "The future we want", recognised both the plight of the urban poor and the need for sustainable cities as matters of great urgency' (UN, 2014) As a priority area, sustainable cities were discussed against the back-ground of the Sustainable Development Goals (SDGs), specifically SDG 11 which prescribes inclusive, safe, resilient, and sustainable cities; 'this comes as a universal recognition that human life in all its dimensions is inseparable from the wide variety physical (either natural or, increasingly, man-made) circumstances that give humankind vital sustenance' (UN Habitat, 2016, P.87) Since a majority of the global population now live in urban areas, adequate planning from governments to provide a vital support system is a necessity. Nonetheless, it is questionable, knowledge and information on what makes a functioning city, especially one of extensive size, work.

4.3 Progress with SDG 11

With better urban planning and management needed to make the world's urban spaces more inclusive, safe, resilient, and sustainable, it is important to see the progress which has been made to see the possibility of succeeding globally. Progress gives encouragement as it shows that the goals set are achievable and that something is happening; it is not only written words,

but it is also forms of action taken. In relation to Goal 11, ‘as more and more people move to urban areas, cities typically expand their geographic boundaries to accommodate new inhabitants. From 2000 to 2015, in all regions of the world, the expansion of urban land outpaced the growth of urban populations. As a result, cities are becoming less dense as they grow, with unplanned urban sprawl challenging more sustainable patterns of urban development’. (UN, 2015) Similar to the megacity of Tokyo which vastly spread outwards rather than upwards as many large cities do to accommodate a growing population, it is now the largest urban area in the world. Other accomplishments of SDG 11 are the reduction of the number of urban residents living in slums which fell from 39% in 2000 to 30% in 2014; along with the safe removal and management of solid waste by municipal waste collection. (UN, 2015)

4.4 The Sendai Framework for Disaster Risk Reduction 2015 – 2030

The Sendai Framework is a 15-year plan of which it is voluntary and non-binding; it was adopted at the Third UN World Conference in Sendai, Japan on March 18th, 2015. (UNISDR, 2015) This framework aims for the following outcome, ‘the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries’ (UNISDR, 2015) This framework is incorporated into SDG 11, specifically mentioned in target 11. C as a framework in which the implementation of polices and plans should come in line with; towards the inclusion and resilience to disasters. Tokyo, as a city located on one of the most active seismic zones in the world could use and does use such a framework to protect the lives of its citizens.

5. Results

5.1 Tokyo Policy Documents

The following chapter focuses on the overall results, the policy documents taken from Tokyo; Creating the Future: The long-term vision for Tokyo and Creating a Sustainable City: Tokyo's Environmental Policy. While also including a comparative analysis of each document alongside SDG 11 and an over-all assessment of all documents.

5.2 Creating the Future: The Long-Term Vision for Tokyo

In December 2014, the TMG formulated a long-term vision for Tokyo, aiming to make Tokyo the world's best city. This vision focused on Tokyo 2020, alongside the Tokyo 2020 Olympic and Paralympic games and beyond; the games offer Tokyo the opportunity to portray the best parts of their city to all the international visitors. However, this long-term vision was formulated more than three years ago, it is now important with any of the targets set to be completed in a period of two years to see what has been successfully accomplished with this vision. In the case of successful implementations then what can other cities of similar size learn from the possible success of Tokyo and adapt to the needs of their own cities. This long-term vision clarifies basic objectives and policy targets, outlining specific roll-out policies through a three-year execution plan. Simply put, the long-term vision consists of 8 strategies, each of significant importance for future developments. Nonetheless, several the strategies are of greater importance in relation to this thesis than others. Each of the 8 strategies will be described below, a few in more detail than others; followed by a comparative analysis against SDG 11.

5.2.1 Strategy 1: Successful Tokyo 2020 Games

As Tokyo prepares to host the 2020 Olympic and Paralympic Games it is looking at the opportunity this high profile event is bringing this megacity not only for the period of the games but also the potential it holds for after the games; 'what we must not forget in this process is our vision for Tokyo after the games' (TMG, 2014) Beginning with approach one, to make thorough preparations and create a lasting legacy in which venues for the games will be used by many citizens long after the games. Consisting of the following future visions for Tokyo, an environment that allows athletes to put forth their best performance, creating an energized atmosphere by decorating the city, enhancing crisis management systems, having an eco-friendly game via energy efficient technologies (a smart energy city) and offering support after the 2011 earthquake (TMG, 2014)

Approach two aims to create a barrier-free city, 'an environment where everyone can move about with ease, where everyone can move about safely, smoothly and with peace of mind' (TMG, 2014) The accomplishments regarding this approach and strategy are as follows:

Table 5.1 Progress of strategy one's barrier free design (TMG, 2014, P. 6)

	Target Year	Target Level
Barrier free design of areas around game venues and sightseeing spots	2020	Completed
Installation of platform gates at all 78 stations operated by JR and private railways used by 100,000 people or more on a daily basis.	FY2023	Almost Completed

The third approach for this strategy aims to provide comfort and safety international visitors by providing multilingual support that aims to meet basic needs such as easy to understand

signage to move around the city at ease and the availability of medical information in multiple languages. The final approach is to cultivate top athletes and build a city of sports where everyone including people with disabilities enjoys sports; 'an environment where residents can easily enjoy sports such as walking and cycling' with the following targets in mind:

Table 5.2 Walking paths and cycling route targets (TMG, 2014, P.10)

Walking Paths along the rivers	Cycling Routes in marine parks
FY 2024 – 43km	FY2024 – 10km

5.2.2 Strategy 2: Evolving Infrastructure

In terms of evolving infrastructure, Tokyo is thinking big and 'aims to build a transportation infrastructure that will make it the world's most convenient city' (TMG, 2014) Continuing with approach number five, to develop an extensive land, sea, and air network with the following three forms of transport as the three core development structures: the three-ring expressway, the port of Tokyo and Haneda Airport. Congestion has been drastically reduced since the development of the three-ring expressway, 'Tokyo is a safe city where routes for the transport of people and goods in the event of a disaster can be secured' (TMG, 2014, P.15) Success of the expressway:

- Shinjuku to Haneda Airport: 40 minutes → FY2014 – 20 minutes
- Kanetsu Expy to Tomei Expy: 60 minutes → 2020 – 12 minutes (TMG, 2014, P.15)

By FY2025, the Port of Tokyo will contain a terminal capable of accommodating the world's largest class of cruise ships. Aiming to build a seamless, convenient transit network; a system that is easily accessible and safe for all is approach six. An example of the work towards a smoother transport system can be seen in the Toranomon District where an urban development is underway that includes ring road number 2, a new bus terminal and a new subway station all built to make the use of transport more efficient. Like strategy 1 is the aim for a barrier-free city to accommodate the mature city that is Tokyo.

Bicycles are now a more commonly used form of transport globally, used for commuting, shopping, business activities and sightseeing; Tokyo has safe bike routes and offers an efficient bike sharing system which makes the option to bike more accessible to citizens of Tokyo. The aim for 2020 is to have 264km of bike lanes on roads, double that of FY2012. Tokyo has utilized the lack of space available in the city via its parking systems both for bikes and vehicles; this will be discussed in more detail later in the thesis.

5.2.3 Strategy 3: Omotenashi

Briefly, Omotenashi is the Japanese spirit of hospitality, arts, and culture. It is a tradition used to attract visitors from around the world, while promoting Japanese art and culture. `

5.2.4 Strategy 4: Safe and Secure

As the national capital, an area with an extensive population and the fact that this city is located on an active seismic zone; it is necessary for Tokyo to maintain its public safety, security and ensure a high level of disaster resilience. Leading to approach nine, 'to protect the lives and property of residents by raising Tokyo's overall disaster preparedness through strong, comprehensive measures against earthquakes and other disasters such as tsunamis, storm surges and torrential rain' (TMG, 2014, P.32) The idea of resilience is a key aspect of this strategy as can be seen in the following steps forward for Tokyo.

- A city that is seismic resistant via the retrofitting of TMGs public facilities which serve crucial roles in times of disasters (hospitals, evacuation shelters)

- A city that is fire resistant, with some 7,000 hectares of districts consisting of close set wooden houses now fire resistant and many of the roads now serving as firebreak belts. The Tokyo Sustainable Development Policy, which will be discussed below, goes into greater detail in relation to fire resistance.
- Tsunami and storm surge resistance of embankments, floodgates and other river control structures have been enhanced in preparation for an earthquake o the largest class predicted. (TMG, 2014)

The citizens of Tokyo require individual efforts, if everyone doesn't participate alongside the efforts by the TMG for example, targets may not be completely met. Households should for example stock up on emergency supplies, own a disaster response manual and attend disaster drills conducted by residents. (TMG, 2014) While the protection of the city's residents from crime or other forms of danger is emphasised in approach 10, efforts are made via communities to protect children en-route to school by installing cameras and various people volunteering to patrol school routes.

5.2.5 Strategy 5: Supportive Environment

Specifically focused in areas of health and welfare and medical care; aiming to create a sense of security for generations to come. Starting with providing support for parents with no shortage of child day-care services to make Tokyo a city where people feel secure about raising children. The day care services will also be available specifically for those who are sick alongside after school programs to assist parents who may be working. See figure 5.1 below portraying an increase incapacity for childcare.

Figure 5.1 Progress and plans for waitlisted children (TMG, 2014, P.43)

Tokyo is a mature city, with an aging population, approach 12 therefore focuses on senior citizens by establishing a comprehensive care system. This system aims for high quality health care to promote lifelong health as it is estimated that Tokyo's population is expected to age dramatically by 2025 meaning an enhanced homecare environment is needed. (TMG, 2014) Table 5.3 below shows the facilities planned for the future of Tokyo and an aging population, while image 5.2 portrays the idea for an efficient and accessible home care system.

Table 5.3 Care plans for elderly citizens (TMG, 2014, P.44)

	Target year	Target level
Special nursing homes for the elderly	end FY2025	capacity of 60,000 (end FY2013: 41,340)
Long-term care health facilities	end FY2025	capacity of 30,000 (end FY2013: 20,057)
Group homes for dementia care	end FY2025	capacity of 20,000 (end FY2013: 8,582)
Serviced senior apartments, etc.	end FY2025	28,000 (end FY2013: 14,181)

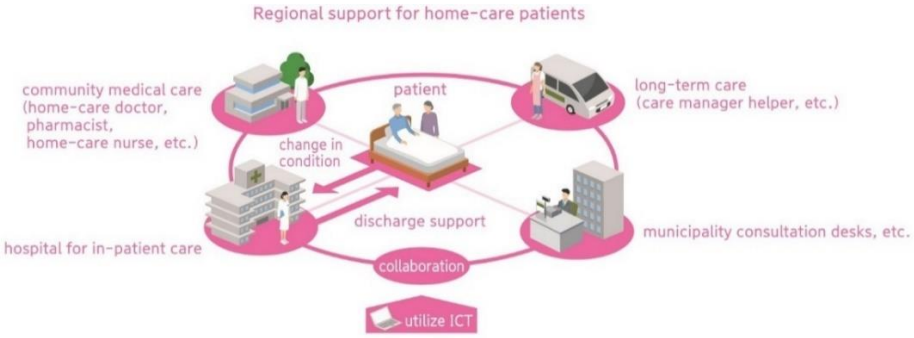


Figure 5.2 Support for Home Care Systems (TMG, 2014, P.46)

All community members need to be included in society, and that means the inclusion of those with a disability via employment opportunities, the option of independent living and finally the creation of a society where everyone respects and supports each other. (TMG, 2014)

5.2.6 Strategy 6: Leading Global City

Yet again, Tokyo aims high wanting to become a Leading Global City by enhancing its strengths in the following areas to be a city that drives the world; international competitiveness, promoting active roles played by women and youth, community development, education, and city diplomacy. (TMG, 2014) Approach 15 works towards domestic growth to attract capital from around the world and create an international business environment. This business environment has been constructed through special zone systems divided into ten areas around Tokyo as can be seen in figure 5.3 below.

Figure 5.3 Tokyo's ten Economic Areas (TMG, 2014, P. 53)

It is noted in strategy 6 that Tokyo is a global financial centre that is on the same level as New York and London, contributing not only to the revitalization of the Tokyo's economy but also to that of Japan and Asia (TMG, 2014) It is due to mass urbanisation that megacities such as Tokyo exist, therefore, urban strength, mentioned in approach 16, for central Tokyo needs to be considered in its planning and development. The future of Tokyo plans to evolve through its urban development in the following ways:

- Major Stations will serve as centres for business and tourism providing access to various destinations within Japan and abroad

- Urban Renaissance will be achieved by using the maximum potential of all communities
- Development of the waterfront area, now a major centre for tourism and recreation and aims to advance the infrastructure of the area further (TMG, 2014, P. 54)

Approach 17 aims to build a society that provides active roles for all through a stable employment market benefitting all citizens regardless of age or gender; which leads to young people who are seeking employment. This will be conducted through internships and different events used to introduce young people into the working world. These events are specifically targeted towards high school students who will soon be entering higher education or going straight into the work force and a form of guidance will be needed and provided. 'The success of women contributes to the economy; therefore, initiatives are underway to encourage women in management positions with financial support available for women entrepreneurs. The current ratio for persons engaged in the work force in relation to women aged 25 to 44 was 71.3% in 2012 and the aim is to reach 75% by 2022' (TMG, 2014, P.61) Wanting to support everyone in the work force also means including elderly citizens who still want to remain in the work force and enhancing the work-life balance for all. Parents and families or those who are sick should be able to work comfortably alongside personal lives.

For a city to move forward all resources need to be considered and developed, this includes the development of human resources; which brings us to approach 18, education in an increasingly globalised and rapidly changing world. This approach is specifically targeted towards the younger generation of the city to create a more international mindset among them. This will be done through academic work and keeping up physical fitness among the youthful population. This international mindset leads to approach 19, in promoting city diplomacy; as a city that already enjoys cooperative relations with 21 cities around the world it only wishes to further enhance it. This can be further accomplished with strong human resources. (TM, 2014)

5.2.7 Strategy 7: Sustainable City

The creation of urban spaces in harmony with the environment, a legacy of infrastructure and a city with a sense of security are all targets towards Tokyo as a more sustainable city. Approach 20 aims to make Tokyo a smart energy city via energy management measures and the expanded use of hydrogen energy, along with stronger disaster preparedness. (TMG, 2014, P.70) Strategy 7 is strongly related to this thesis. With sustainability as a key term for the future of Tokyo. Starting with wanting to lead the world in energy efficiency through different initiatives such as Tokyo's cap and trade program which will be discussed in greater detail below in Tokyo's Sustainable Development Policy. With the introduction of renewable energies which utilize methods suited to the situation in Tokyo e.g. lack of space, a prime example is the installation of solar power generation systems on top of parking structures and the roofs of houses and facilities. Yet again, energy related targets are described in greater detail below including that of a hydrogen society.

If Tokyo wants to be considered a great city, it needs to set an example in how it treats its natural environment; approach 21 focuses on the environment in Tokyo. The creation of a green city with parks, green spaces and greenery on private sector buildings, a clean waterfront environment, clean air, and comfortable spaces. 'The amount of air pollutants emitted by cars, ships and other sources has fallen and air quality has further improved. Roads in the centre of Tokyo have heat blocking pavements and water retentive pavements' (TMG, 2014, P.74) Improvements are being made to the environmental quality of the city as can be seen in the improvements of air quality.

Enhancing the safety and reliability of urban infrastructure through maintenance and management is the focus of approach 22, the use of innovative technology and systematic renewal and function upgrades. As can be seen in table 5.4 below these services are focused on the service life and renewal of infrastructure with their own unique take on ways to do so.

Table 5.4 Service life and renewal of infrastructure plans (TMG, 2014, P.76)

		Target year	Target level
Extension of bridge service life	Bridges undergoing measures	FY2024	Total of 160
	Famous bridges over Sumida River undergoing measures	FY2020	11 completed
Renewal of sewer lines	4 early developed areas in the city center	FY2029	100% completed (16,300ha)

As previously mentioned, Tokyo is a mature city, infrastructure therefore needs to be built to accommodate an aging society. It is here that Tokyo utilises its compact communities 'by systematically building housing, commercial facilities and medical care, senior welfare and child care facilities around railway stations' allowing ease of access. (TMG, 2014, P. 78) This creates a sense of security and belonging for community members.

5.2.8 Strategy 8: Tama Area and Islands

Set apart from central Tokyo, the Tama area and Islands are rich in nature. The final strategy for the future of Tokyo focuses on these areas with approach 24 aiming to build an environment for growth and development distinctive in reflecting each area unique environment. The Tama north-south roads are almost complete, with good progress been made on the Tama east-west roads. The development of the roads in the Tama area effect the level of disaster preparedness due to its mountainous terrain, this has resulted in the construction of alternative roads which serve as routes of evacuation and emergency service access. (TMG, 2014) Figure 5.4 below demonstrates the targets set for disaster preparedness in both the Tama area and the Islands.

Figure 5.4 targets set for disaster preparedness (TMG, 2014, P.83)

The final approach, number 25, wants to use the natural environment while protecting it to utilize communities. The promotion of local products in agriculture, forestry, and fishery though a high-profile event such as the Tokyo 2020 games allows for Tokyo to demonstrate its potential to international visitors. This can impact Tokyo's target towards a more global city and benefits the tourism industry.

5.3 New Tokyo. New Tomorrow, The Action Plan for 2020

Formulated in 2016 by the Tokyo Metropolitan Government, the Action Plan for 2020 is a four-year plan covering the period from FY2017 through FY2020. Designed from the perspective of putting the citizens first through the three faces or 'cities' of Tokyo which are as follows: 'Safe City', 'Diverse City' and 'Smart City' and aim at the creation of a 'New Tokyo'. This document is divided into three sections with the first comprised of the

approaches and plans to be taken towards achieving each of the three cities, followed by Tokyo's first growth strategy and plans for Tokyo's future. The end of this document consists of basics facts about Tokyo on a more general basis.

5.3.1 City One - Safe City

'A 'Safe City' is a city that protects the lives and assets of the Tokyo residents from disasters and is full of dynamism and bustle' (TMG, 2016, P.3) The creation and development of a safe city, specifically one of such a large magnitude as that of Tokyo involves a vast amount of work and various approaches taken, that of seven approaches are described in the 'Safe City' section and will be described below.

Advancement in the removal of utility poles in the hopes of making 'Tokyo a beautiful, safe and walkable city, where roads do not become obstructed even in the event of an earthquake', as of FY2015 'only about 7% of the roads in Tokyo's 23 ward area has been rid of utility poles' (TMG, P.4) A form of disaster resilience development that works towards making roads more accessible during times of disasters to be accomplished via financial and technical support.

Creating a city that does not collapse or burn, referring to the fact that Tokyo is located above an active seismic zone and refers to the seismic resistance of buildings (FY2014 – 83.8% → FY2020 – 95% or more) and the fire resistance districts with close set wooden houses (FY2014 – 61% → FY2020 – 70%) (TMG,2016, P.5) The creation of an earthquake resilient city and long-lasting infrastructure for future generations.

Enhancing community disaster preparedness by conducting mandatory participation in disaster drills, the use of virtual reality, increasing the number of volunteer fire corps members and providing disaster management consultants and manuals. The idea of consultants can help communities who were affected the most by a disaster learn to rebuild in a more resilient way and provide information on more safety measures to be taken. According to the Action Plan for 2020, 'there are 13,865 volunteer fire corps members in the special ward area as of April 1, 2016, with numbers decreasing annually as members retire due to age' (TMG, 2016, P.6)

Torrential rain counter measures mainly refer to the prevention and management of flood disasters via the construction of a regulating reservoir, an efficient sewage system and constant online updates of Tokyo's flood risk maps.

Maintaining and renewing urban infrastructure, with 'about 30% of the 1,226 bridges and 20% of the 123 tunnels were built more than 50 years ago', Tokyo is an aging city that needs to be rejuvenated not only in terms of its infrastructure but also to accommodate an aging population (TMG, P.8) As mentioned in the long-term vision for Tokyo also, both aim to create a long lasting legacy of good urban infrastructure through the construction of sustainable infrastructure and the constant maintenance and renewal of existing infrastructure.

Bolstering counter terrorism measures, specifically mentioned here is the threat of terrorism during the Tokyo 2020 games through the development of an emergency camera image transmission system; 'the use of private security cameras to grasp the situation of damage at the site in the event of a large-scale disaster such as terrorism' (TMG, 2016, P.9) The Tokyo 2020 games are a major international event mentioned in various documents when it comes to future development of Tokyo and its success.

Finally, for the creation of a ‘safe city’ is community development in the Tama area and Tokyo islands; with approaches set close to that of strategy 8. Addressing challenges and specific features of each area, and the development of ultra-high-speed broadband. Along with the overall protection and development of the unique natural environment in these areas.

5.3.2 City Two – Diverse City

‘A “Diverse City” is a city where everyone can lead vibrant and active lives’ (TMG, P. 11) There are 9 areas of consideration discussed to create a city of greater diversity.

A city where people can feel secure about having and raising children, with an increase in children in childcare and no waitlists for childcare; ‘as of April 2016, children in day care has increased by 14,192 over the previous year to 261,705 children. Due to growing needs, however, the number of children on waitlists has risen to 8,466 children, an increase of 652 children over the previous year’ (TMG, 2016, P.12) Creating peace of mind for all communities, for all children, for parents, for marriage, and for pregnancy via subsidizing the cost of the construction of day care facilities, support to secure day care staff and securing after school facilities for children. Also mentioned above in strategy 5 and the creation of a supportive environment.

A society where senior citizens can live with peace of mind by constructing special nursing homes for the elderly, increasing the capacity to 60,000 (FY2025) and constructing group homes for dementia care, increasing the capacity to 20,000 (FY2025). ‘Between 2015 and 2025, Tokyo’s 65 and over population is projected to rise from 3.01 million to 3.26 million’, also falling in line with strategy 5 in creating a comprehensive regional care system in terms of medical care, long-term care, preventive care, living support and housing. (TMG, 2016, P.13) The idea is to make it possible for all senior citizens to continue living comfortable in their own communities.

Enhancing healthcare and encouraging healthy living adds on to the above-mentioned approach not only caring for an aging society but also encouraging lifelong healthy living by targeting lifestyle related issues, strengthening all medical systems, promoting home care and more.

A society where the disabled can lead vibrant lives, specifically encouraging the employment of the disabled; ‘in 2016, the employment rate of people with disabilities at companies in Tokyo was 1.84%, failing to reach statutory employment rate of 2.0% for people with disabilities’ (TMG, 2016,P.15) No matter a person’s disability they should be given the opportunity to live independent lives firstly via job opportunities and also through housing, support, education and the promotion of understanding about disabilities.

Enhancing life-work balance, also discussed above in strategy 7 with the promotion of rethinking work styles and for men to engage in housework and parenting to be increased to 70% by FY2020. Public transportation to be made more comfortable to encourage commuting to work more.

Advancing the active role of women in society, mentioned in strategy 7 also is an important area of concern; ‘the percentage of working women drops for age segments where marriage and childbirth generally take place and rises again when child rearing settles down’ (TMG, 2016, P.17) Women should have the possibility to play active roles in society and pursue advancement in their careers.

Promoting the employment of senior citizens, not only should the older generation of the city be comfortable living in their own communities, but they should also be able to continue with

work if they wish to stay active throughout their lives. However, this means diverse employment needs are created and a mismatch between those wishing to work and the employment needs of companies; a change of careers may be needed due to a mismatch of skills. The public employment security office or Hello Work aids senior citizens in possible career changes to suit their needs. (TMG, 2016)

Advancing urban development that incorporates universal design, 'universal design means designing the city and environment with the aim to create spaces that can be used by as many people as possible from the start', which is targeted at the Tokyo 2020 games and the creation of a barrier free city (TMG, 2016, P.19) 'By using the opportunity presented by the Tokyo 2020 Games, we will advance urban development that incorporates both tangible and intangible universal design, a concept of design friendly to all' (TMG, 2016, P.19)

And finally, education that expands possibilities for all children, relatable to the idea mentioned in strategy 6 above; the improvement of the educational environment, including the aspect of household finances, education that is tailored to each child's situation and ultimately cultivate global talent. (TMG, 2016, P.20) This would also include an improvement in the English ability of students.

5.3.3 City Three – Smart City

A "Smart City" is a vibrant city that keeps growing, a city open to the world, a city leading the world on environmental policies, and a global financial and economic centre' (TMG, 2016, P.21) Consisting of 9 main areas to approach as will be described below.

Smart energy city, as previously discussed in strategy 7: Sustainable City. Tokyo aims to become a world-leading smart energy city via the promotion of energy saving measures, promoting the use of hydrogen, and encouraging the use of LED lighting (as mentioned above with a light bulb exchange) LEDs comprise about 58% of lighting used in Tokyo's households, as a major consumer of energy it emits large quantities of CO2 (TMG, 2016) The TMG wants to make all its facilities zero-energy buildings.

Back to tradition as with strategy 2, is the implementation of the spirit of mottainai (too precious to waste). The lifestyle of citizens will be made more sustainable through the reduction of food loss, effectively using the emergency food stock, stopping the free distribution of plastic bags all by FY2020. 'In Japan, about 6 million tonnes of food that can be eaten safely is disposed of in a year. This is equivalent to one bowl of rice per citizen per day' (TMG, 2016, P.23)

A comfortable city where people feel close to nature, the creation of green spaces, parks, and cool areas against the heat of the city as discussed in both the long-term future for Tokyo and the Tokyo's Environmental policy. This is considered for both public and private areas and is key in the sustainability of a city.

Becoming a global financial city, restoring Tokyo as Asia's No.1 global financial city as described via the financial areas in strategy 6 to become a leading global city. An important point mentioned here environmentally is the suggestion of green bonds and the advancement of environmental policies while attracting foreign businesses in the fintech fields. Fintech is word made from the combination of finance and technology, a movement to change how money flows and create new industries through financial services using innovative technologies. (TMG, 2016)

Creating innovations and supporting SMEs (small and medium sized enterprises) through the implementation of sustainable growth of Tokyo. The support for development projects, start-up projects and promoting localized and traditional crafts.

Tokyo: The world's prime tourist destination, with over 25 million foreign visitors predicted by the year 2020, the tourist industry is booming and 'the number of foreign travellers to Tokyo has been increasing significantly in recent years. In 2015, the number reached a record 11.89 million. (TMG, 2016) Not only will Tokyo be made comfortable for its citizens but also for its foreign visitors via multi lingual sign usage and the introduction of more western-style toilets and promote Japanese culture.

Leading to the next point which is the promotion arts and culture, the Tokyo 2020 games are not only a festival of sport but also a festival of culture. The utilization of Tokyo's cultural rich districts is key here in making Tokyo even more attractive.

Building up the land, sea, and air transport network, as discussed in Strategy 2: Evolving Infrastructure; 'there is a need to ease road congestion and crowding on trains, and to accommodate the large number of international airport users coming for the Tokyo 2020 Games' (TMG, 2016, P.29) The three-ring expressway is key here as in strategy 2 along with the development of Tokyo's port and Haneda airport.

The final point for a "Smart City" is urban development with a diversity of functions to support Tokyo's growth. Nine areas around Tokyo are discussed here with different aspects of development in each for example are the following few: Ikebukuro – vibrant international centre of arts and culture; Takeshiba – Business centre building on the strengths of the private sector and contributing to global competiveness; Toranomon – Transportation hub connected to airports and the waterfront area are among a few of the areas mentioned.

5.3.4 Budget Situation

This plan has implemented a budget proposal to cover all the projects and plans to be approached via the Action Plan for 2020, totalling JPY 1,4396 trillion (equivalent to 1,103,869,265,500 trillion Euros) The budgets for each of the cities of Tokyo and the various plans for different areas within each can be seen in Figure 5.5 below. The budget is thorough and allocates a specific amount to each area in the hopes of meeting the aims set out by 2020.

5.3.5 Plan-Do-Check-Act (PDCA) cycle

The progress of this Action Plan for 2020 needs to be measured as it can help with keeping track of each target, therefore, the Plan-Do-Check-Act (PDCA) was implemented. This helps to monitor the steady advancement of each policy. It is a 'system to formulate plans (Plan), implement policies and programs (Do), manage progress and evaluate programs (Check), and improve and review programs (Act) – the PDCA cycle – was incorporated into the plan from the formulation stage' (TMG, 2016, P.36) It is a concrete set of policies that is built on the 360 policy targets of the Long-Term Vision for Tokyo, raising the number of targets to 500; while allowing for proper management of the progress to be monitored.

5.3.6 FIRST Strategy: Tokyo's growth strategy

As in the title of this document, it is First Future Tokyo, as in the First Strategy which consists of five strategies to be used to achieve its goals; the first letter of each strategy spells out FIRST and demonstrates the plan to be taken to make Tokyo number one in the world and the first to take on challenges to create growth for the country. The five strategies can be seen below in figure 5.6 and presents the five key strategies being put forward to be

developed within this first strategy including the following: Finance. Innovation. Rise. Success. Technology. (TMG, 2016)

	Budget (JPY billion)
Safe City	**840.4**
Creating an earthquake-resilient city	395.5
Improving disaster preparedness through self-help, mutual assistance, and government support.	62.1
Countermeasures for torrential rain and sediment disasters	81.4
Maintaining and renewing urban infrastructure	158.0
Securing safety and security	8.2
Creating community vitality	73.2
Advancing development of the Tama area and Tokyo islands	62.1
Diverse City	**352.6**
A city where people can feel secure about having and raising children	102.9
A society where senior citizens can live with peace of mind	34.6
A city with a substantial healthcare system where people can lead healthy lives	10.3
A society where the disabled can lead vibrant lives	33.8
A city where all can actively participate in society	22.0
A city where all can sense kindness	53.7
Cultivating talent for the future	37.7
A society where sports is accessible to all	57.5
Smart City	**557.7**
A smart energy city	76.1
Creating a pleasant urban environment	104.6
Creating and preserving a rich natural environment	39.5
A global financial and economic center	37.4
Creating a transportation and logistics network	210.2
Urban planning that concentrates various functions	22.1
An international city and tourist destination open to the world	44.1
Promoting the arts and culture	23.8
Total	1,439.6

Figure 5.5. Implementation Budget for the Action Plan for 2020 (TMG, 2016, P.35)

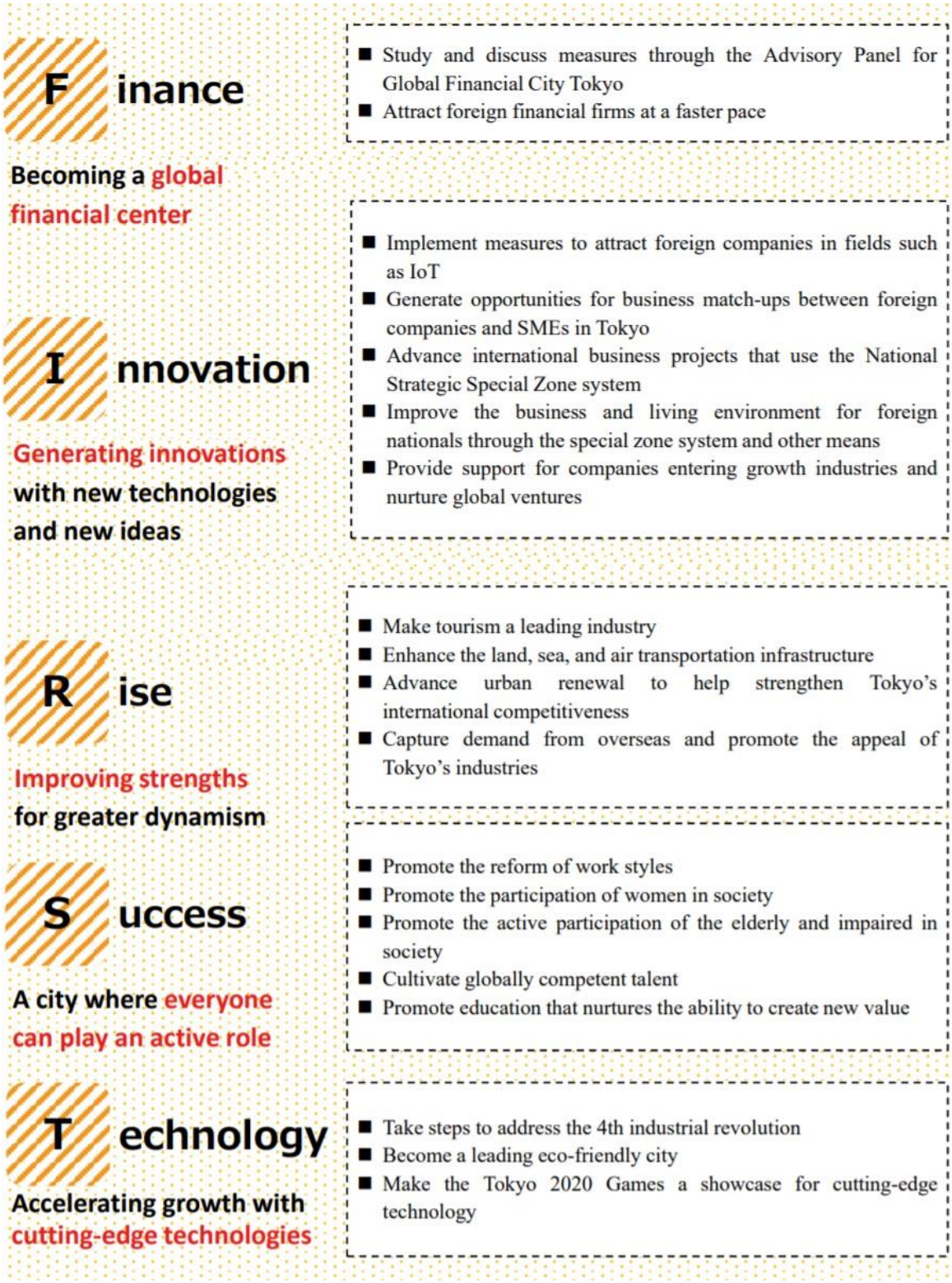


Figure 5.6. FIRST Strategy: 5 strategies for growth (TMG, 2016, P.38)

5.3.7 A vision for Tokyo's future

2020 is the target year but beyond 2020 needs to be considered as all these plans may be implemented and may be successful but it nothing continues to further improve and develop beyond 2020 then what will happen to the city. Therefore, the Action Plan for 2020 also

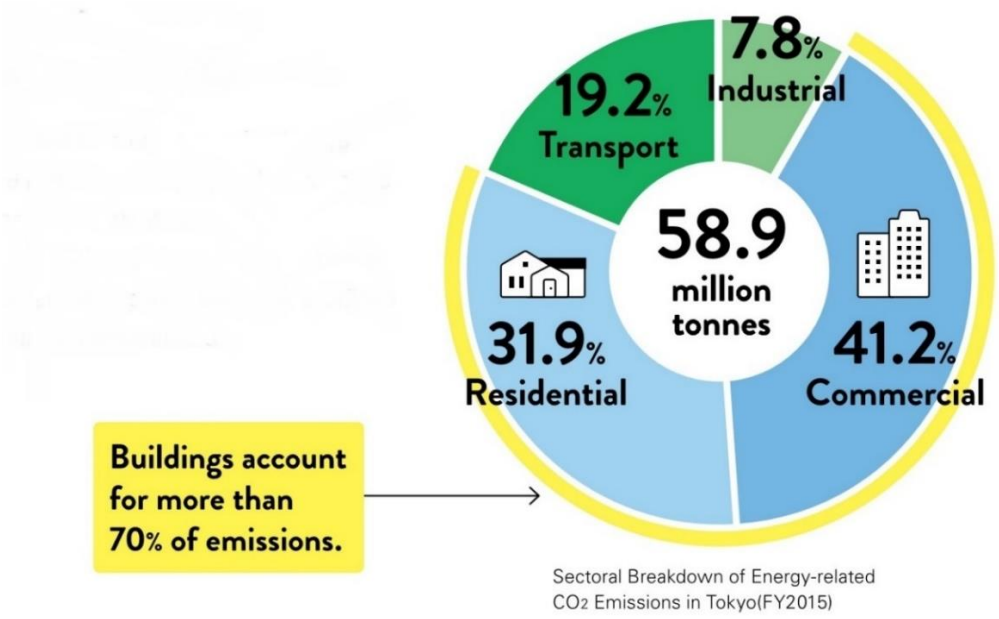
discusses Tokyo's future. 'For the ongoing sustainable growth of Tokyo, sharp insight into what lies ahead and readiness to also respond to rapid social changes are needed' (TMG, 2016, P.39) Therefore, the last section presents a vision for Tokyo's future. This future vision even details morning, work and after work activities such as spending time with family before work, traveling to and from work comfortably using public transport is guaranteed, career change can be done as a person wishes to do so, women will fill half of the management positions and even scheduling time spent with pets. (TMG, 2016) The shape of the city will be completed in what has been written in the plans for 2020 including automated vehicle technology to eliminate traffic congestion, utility poles no longer exist and the infrastructure from the 2020 games lives on after the games as sports centres. The sustainable lifestyle is fully implemented with smart house systems, 'the word "garbage" is now obsolete. Everything is reused and recycled for a complete recycling society' (TMG, 2016, P.41) Tokyo will have a healthy life expectancy, a parent friendly environment, be a business-friendly city and a captivating city to others around the globe. The targets set are set to be achieved according to the future for Tokyo's future.

5.4 Creating a Sustainable City – Tokyo's Environmental Policy

2020 and 2030 are two major target years for the TMG who have set policy targets towards developing an environmental and energy initiative focused city for the 2020 games and beyond. Through the Tokyo Environmental Policy, the TMG is aiming for a strong sustainable city to be created. This policy is divided into various chapters from 1 to 4 which all focus on specific areas related to sustainable development; each chapter discusses different policies which aim to reach the 2020 and 2030 targets. The policies set by the TMG are designed to suit that of the needs of a megacity such as Tokyo.

5.4.1 Climate Change and Urban Energy

This section focuses specifically on sustainable building policies, with three programs or policies related to building sector. As the largest consumer of resources in Japan, energy consumption targets have been set and the energy consumption of Tokyo has fallen; various sectors account for the CO2 emissions of Tokyo as can be seen in figure 5.7 below.



Sectoral Breakdown of Energy-related CO_2 Emissions in Tokyo(FY2015)

Figure 5.7 Sectoral breakdown of energy-related CO2 emissions in Tokyo (TMG, 2017, P.6)

The three policies are designed towards specific building types and size, at the core is the Tokyo Cap and Trade Program for large facilities, along with the Carbon Reduction Reporting Program for small and medium sized facilities and the Green Building program for new buildings.

5.4.1.A Sustainable Building Policy 1: World's First Urban Cap-and-Trade Program for Large Facilities

As mentioned above this program is an initiative to reduce carbon dioxide emissions quickly and significantly; introduced in April 2010 as the world's first urban cap-and-trade program. Reduction requirements through on-site energy efficiency measures or emissions trading, along with annual reports allowing for continuous monitoring of emissions. The design of the program can be seen in figure 5.8 below.

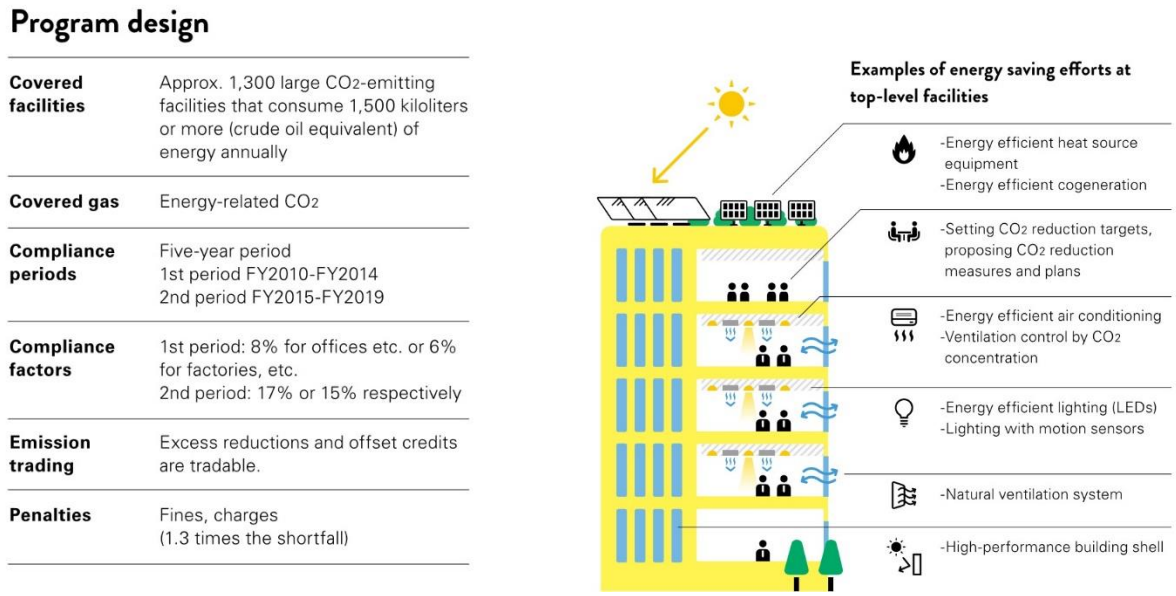


Figure 5.8 Urban cap-and-trade program design. (TMG, 2017, P.7)

Facilities which demonstrate outstanding performance in emissions reduction and in the use and management of energy efficient equipment are certified as top-level facilities.

Results from this program or policy include a 26% reduction compared to base year emissions, with approximately 80% of all the covered facilities having already achieved reductions above their compliance targets. Along with 78% of these reduction rates among facilities exceeding the compliance factor and 22% of these facilities whose reduction rates fell short of the compliance factor. Reduction obligations were met at 91% through each facility own energy efficiency measures and the remaining 9% through emissions trading (TMG, 2017)

5.4.1.B Sustainable Building Policy 2: Carbon Reduction Reporting Program for Small and Medium Facilities

'CO2 emissions from small and medium sized facilities account for approximately 60% from the entire industrial and commercial sectors in Tokyo' demonstrating the importance of

reducing emissions. (P.9) This resulted in the introduction of the Carbon Reduction Reporting Program which is specifically aimed at assisting small and medium sized facilities; identifying and reducing CO2 emissions. The TMG provides low carbon bench marks to allow facilities to conduct a self-rating and then report the findings.

Results include the following:

- Reduced by 13.3% below 2010 levels in 2014
- Reduced by 13.5% below 2013 levels in 2014 (TMG, 2017, P.9)

5.4.1.C Sustainable Building Policy 3: Green Building Program

Owners of large buildings are required to submit a 'Building Environmental Plan' with the 'aim to form a market that appreciates environmentally conscious buildings'. The Green label depicts the criteria that need to be met to meet a specific environmental performance level, seen in figure 5.9 below. With the idea for building owners or developers to construct more environmentally conscious buildings.

Figure 5.9 Green Label for Condominiums (TMG, 2017, P.9)

Simple ideas and steps can be taken which can make a significant impact towards a more sustainable environment. An example of this is the LED light bulb exchange program, which involves the possibility to exchange two or more incandescent light bulbs for one LED light bulb at no change. This program also offers energy efficient advice through various participatory electronic stores in Tokyo.

5.4.1.D Mitigation of an Urban Heat Island

A critical challenge for Tokyo is the urban heat island effect, in which measures ae been taken to reduce the heat of the city for citizens and tourists. An attempt to make the city more comfortable to move about in.

- Creation of Cool Spots via the installation of fine mist generation equipment or by planting more flowers and trees to create green walls of shade around the city.
- Uchimizu (water sprinkling) is a traditional part of Japanese culture which helps to lower the temperature of the ground surface. 'TMG is making efforts to promote uchimizu activities by working alongside citizens and businesses in Tokyo'
- Solar Heat Blocking pavements and water retaining pavements are being laid by the TMG to mitigate road surface temperatures. As of March 2017, 106km of pavements were completed.
- The maintenance and management of trees to ensure shade.

5.4.1.E Expansion of Renewable Energy Introduction

In 2015, 11.1% of the total electricity used in Tokyo was generated by renewable energy. (TMG, 2017) Specifically, the use of solar power generation as the city has the potential to further expand solar power via the Tokyo Rooftop Solar Register. This register is accessible by the public and shows what buildings throughout the city are suitable for solar power generators. This allows not only governmental facilities to construct solar power equipment on their buildings but also business owners or privately-owned buildings.

Tokyo for example depends on power sources from other regions for a large amount of its power supply as a large electricity consumer. Therefore, supply needs to meet demand to satisfy and provide consumers but in an environmental manner. The supply side is a measure for energy suppliers to improve the environmental properties of electricity, reduce CO2 emissions, set targets for renewable energy volume, and then report the results via the Environmental Energy Reporting Program. The demand side is mechanism for consumers to select electricity from renewable energy along with the Green Labelling program which also helps stimulate consumers in selecting renewable energy.

5.4.1.F Creating a Hydrogen Based Society

Hydrogen is a clean energy that emits only water when used, it is a step towards a low carbon society. Tokyo has a JPY 40 billion fund set up to support efforts towards a hydrogen-based society. (TMG, 2017) The resource availability for Tokyo, for example, in this case of developing a hydrogen-based society, allows it to achieve and have the possibility to create a more sustainable society. A lack of resources is more than often the case for the lack of sustainable development, as it does not come cheap.

As mentioned previously in the Long-Term Vision for Tokyo is the promotion and use of fuel cell vehicles and buses; as of March 2017, two fuel cell buses are part of regular routes (TMG, 2017)

Table 5.5 Targets set for the use of fuel cell vehicles (TMG, 2017, P.13)

Targets	6,000 Vehicles and at least 100 Buses by 2020	100,000 Vehicles by 2025	200,000 Vehicles by 2030

Specifically mentioned in Strategy 7 of the Long-Term Vision, by 2020 to have 35 hydrogen stations; primarily installed in downtown Tokyo. With 80 stations to be installed by 2025 and 150 stations by 2030. The hydrogen supply system will run via pipelines and the various hydrogen stations. (TMG, 2017) In wanting to promote and for everyone to have a better understanding of hydrogen as a fuel source, citizens and different facilities will be properly educated about the use of hydrogen as an energy source. In July 2016, the Tokyo Hydrogen Museum was opened by the TMG demonstrating technology, safety, and prospects with the use of hydrogen (TMG, 2017)

5.4.2. Sustainable Materials and Waste Management

5.4.2.A Sustainable Use of Resources

‘The consumption of resources is expected to further increase along with the economic development of emerging countries’, the insurance of sustainable consumption and production patterns is a necessity. Tokyo accounts for a significant proportion of the use of resources in Japan, resulting in the establishment of the Sustainable Materials and Waste Management Plan. In this instance there is the 3Rs explained as follows:

Reduction – Food Waste: 270,000 tonnes in Tokyo from the food service industry and households

Recycling – Decrease the use of single use products

Responsibility – Citizens as generators of waste have act responsibility in their day to day routines

Yet again, educating citizens towards a more sustainable lifestyle; sanitation workers go to classrooms at elementary schools to give environmental lessons with leaflets given to provide information on how to separate and dispose of recyclable resources/garbage. Almost all unrecyclable waste is incinerated in Tokyo, including incinerator ash as raw material for eco-cement or molten slag. (TMG, 2017)

5.4.3 Urban Biodiversity and Greenery

5.4.3. A Conservation of Biodiversity and Creation of Greenery

As one of the largest cities in the world, spreading out from the mainland to the Ogasawara Islands. The amazing aspect of Tokyo is that it not only consists of urban central areas with green spaces such as trees and parks but also of different natural environments: suburbs partly covered in woods and fields, satoyama (open light filled woodland), hilly terrain full of biodiversity, steep mountain areas covered in primeval forests and islands. (TMG, 2017, P.20)

The development of the Greenery Program aims to encourage the creation of greenery parallel with urban development, with a requirement including the submission of a greenery plan satisfying the greenery standards and the following aims in mind:

Newly constructed, renovated, or extended buildings of 1,000m2 or larger in site area (Public Buildings: 250m2 or larger)

Buildings are required to cover at least 20% of their roof area with greenery and 20% of the open space on the ground. (TMG, 2017)

The Ogasawara Islands consist of over 30 islands and is in the North West Pacific 1,000km south of Tokyo. The Ogasawara Islands is an area with a unique ecosystem with the living creatures on the island never having been part of any continent. These islands were registered as a World Natural Heritage Site in June 2011 as they reveal the evolution of and connection between living things never seen in any other areas. (TMG, 2017) It is an area that is protected and should be respected by anyone visiting the area, so it can remain as natural.

5.4.4 Clean and Comfortable Air

5.4.4.A Air Quality Management

1970s → The Tokyo Metropolitan Government (TMG) regulated air pollutants such as soot and smoke from factories through ordinances and other regulations.

1990s → In parallel with an increase in traffic, air pollution escalated, which was attributable to black smoke (particulate matter) caused by automotive emissions. TMG regulated exhaust gas from diesel vehicles in 2003.

Present → The air quality in Tokyo has improved significantly. However, the concentration of photochemical oxidants and PM2.5 exceeds the environmental standards at many monitoring stations. (TMG, 2017, P.23)

The TMG is working on efforts to reduce emissions such as volatile organic compounds (VOCs) and nitrogen oxide (NOx)

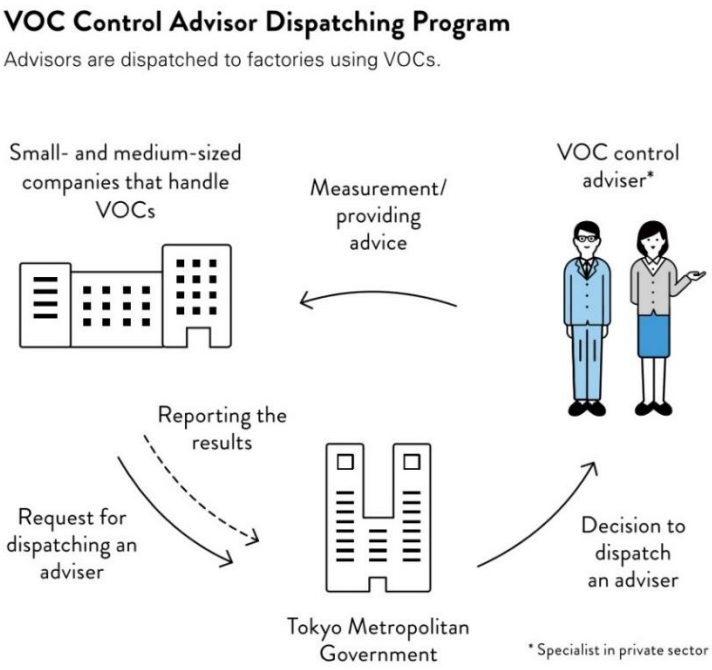


Figure 5.10 VOC control advisor dispatching program (TMG, 2017, P. 24)

Along with this program is an Air Pollution Monitoring System, with monitoring equipment at 82 locations in Tokyo for 24-hour continuous monitoring.

Automotive Emissions Regulations via measures against diesel emissions with large vehicles; if they do not meet the required standards they are not allowed to be driven in the Metropolitan area. To ensure that these regulations are effectively enforced former police officers are employed as automobile pollution inspectors; if anyone violates the regulations their vehicle can be prohibited from operation. Businesses which use 30 or more vehicles are required to submit a Vehicle Emission Reduction Plan.

5.5 Comparative Analysis

Based on a long track record of achieving sustainable development both at home and abroad, Japan is taking further steps in domestic activities and international cooperation, to fully implement the 2030 Agenda (MOFA, 2017) This has resulted in the development of the National Implementation Framework and the formulation of the Implementation Guiding Principles (IMP); along with the launch of the Sustainable Development Goals Promotion Headquarters. The 2030 Agenda or SDGs states that ‘each government will also decide how these aspirational and global targets should be incorporated into national planning processes, policies and strategies’, the IMPs for example incorporate the SDGs into their plans, strategies and policies. (UN, 2015) The TMG has worked in implementing the SDGs into their plans and policies and will be examined in specific relation to SDG 11 and the three documents examined from the TMG. On May 20th, 2016, the SDGs Promotion Headquarters was launched as a new national framework to be headed by the Prime Minister; it is planned to serve as a control tower to implement, monitor and review the efforts of the Government to implement the SDGs. The formulation of the IMPs began at the first meeting of the SDGs Promotion Headquarters and on the second meeting, December 22nd 2016, these principles

became a national strategy and the vision for Japan was written; 'Become a leader toward a future where economic, social and environmental improvements are attained in an integrated sustainable and resilient manner while leaving no one behind' (UN, 2015) In the formation of these principles the government sought opinions of citizens and held numerous dialogues with citizens and stakeholders; past efforts and experiences has allowed it to achieve a high level of development.

The extensively large urban metropolis that is Tokyo, an exceptional city in its functionality and design that has worked to get to where it is today in implementing strong sustainable and resilient policies. Which has set specific targets designed to meet the unique needs of the city of Tokyo. For the research of this thesis a total of three documents were examined, all of which were comprised by the Tokyo Metropolitan Government or TMG and included the following:

- ➔ Creating the Future: The Long-Term Vision for Tokyo
- ➔ New Tokyo. New Tomorrow. The Action Plan for 2020
- ➔ Creating a Sustainable City: Tokyo's Environmental Policy

A comparative analysis of all three documents, alongside SDG 11 will be conducted below as part of the examination of the progress and success of Tokyo.

Table 5.6 below visibly shows the key plans or policies from each of the three documents examined in line with the four key criteria taken from SDG 11. The targets set out by SDG 11, as can be seen above in detail in Table 1.1 are designed for cities to use and incorporate into their own policy targets to aid in achieving SDG 11. As no two cities are the same, each facing their own challenges, the targets and indicators from SDG 11 may be interpreted and used differently but all aiming for the same outcome 'to make cities and human settlements inclusive, safe, resilient and sustainable. In this instant, it is not just the city of Tokyo but the entire metropolis of Tokyo interpreting and working towards SDG 11 that is examined. The structure of Table 5.6 below is as follows:

The first column consists of the four criteria taken from SDG 11 and a brief description of each which can be found in greater detail in the literature review section above. The following three columns consist of the three documents examined, in order of the year they were published and implemented; each of the documents are structured differently, divided into either chapters or strategies but all focusing on many of the same issues. The main plans and policies of each of the three documents that fit into or relate to one or more of the criteria are written below the document the title document it is from and written in line with the key criteria. The Tokyo Environmental Policy relates more to the sustainable aspect, with almost all points or policies related to the environment; with most of these policies also relatable to the other three criteria. The first and second document examined are strongly linked to each other, demonstrating Tokyo's progress forward. Tokyo has not only taken the needs off all its residents into consideration, but also that of all international visitors, the natural and man-made environment, the development of urbanisation in parallel with green spaces; contributing to sustainable development from economic, environmental, and social perspectives.

In all three documents the amount of progress for all discussed approaches, aims or targets are listed and the increase in progress and completed projects is visible on the more recently published documents. Beginning with the Long-Term Vision for Tokyo describing 8 key strategies in detail, followed by the Action Plan for 2020 leading on from them into more detail or to completion to a direct environmentally related policy for Tokyo; with specific requirements detailed for all parties involved, both private and public. Tokyo learns from its

experience and continues with a repetitive trend so that no plan or policy appears left unfinished and continues forward into the next document. The success of SDG 11 in a city perspective is possible with forward movements such as Tokyo's.

Table 5.6 Comparison of the three examined documents and the key criteria taken from SDG 11

Key Criteria and Targets from SDG 11	Creating the Future: The Long-Term Vision for Tokyo (2014)	New Tokyo. New Tomorrow. The Action Plan for 2020 (2016)	Creating a Sustainable Future: Tokyo's Environmental Policy (2017)
Inclusive ➔ A world that is not divided by differential access to opportunities, consumption, public spaces, services, education, technology, and employment ➔ To many cities fail to make sustainable space for all, not just physically but also in the civic, socio-economic, and cultural dimensions	Strategy 1, 3, 5 and 6 demonstrate clear aspects in creating an inclusive society Strategy 1 – Tokyo 2020 Games ➔ The creation of a barrier free city, making it more accessible for all regardless of age, sex, or persons with disabilities Strategy 3 – Omotenashi ➔ Building a community of support Strategy 5 – Supportive Environment ➔ A city that provides efficient home care ➔ A city that provides group homes for the disabled ➔ A city that raises awareness of disabilities ➔ A city that promotes the active role of women ➔ The utilization of former metropolitan housing land to house welfare facilities Strategy 6 – Leading Global City ➔ Working towards a globally inclusive world by sharing challenges and cooperating with over sea cities, providing information on best practices, and therefore working together to develop better policies	The entirety of the 'Diverse City' section, where everyone can lead vibrant and active lives demonstrates an efficient and equal use of all forms of space not just physically but also civic, socio-economic, and culturally. An attempt to decrease the gap between differentiated access to opportunities, public services, education, salary and more ➔ A society where senior citizens can live with peace of mind ➔ A society where the disabled can lead vibrant lives ➔ A society that advances the active role of women ➔ A society that uses education to expand possibilities for all children	Chapter 01 – Climate Change and Urban Energy ➔ The development of a hydrogen-based society means that everyone should understand this change and Tokyo aims to do so with educating people on the potential of hydrogen as a source of power via its educational institutions such as the Hydrogen Museum Chapter 03 – Urban Biodiversity and Greenery ➔ Not only should a city be inclusive for the citizens residing in it but also to the environment in which it is in creating green spaces in parallel with urban development
Safe ➔ Globalization may have enhanced risks within urban areas relating to crime and violence, health, natural and man-made disasters and more. ➔ High density of a city in terms of both population and space makes its infrastructure easily visible and more open to attacks	Strategy 1, 2, 4, 5 and 7 demonstrate aspects of safety Strategy 1 – Tokyo 2020 Games ➔ The goal of hosting safe and secure games by developing crisis management systems ➔ A barrier free city to create safety for the residents of Tokyo and for all international visitors Strategy 2 – Evolving Infrastructure ➔ The development of a safe bike route Strategy 4 – Safe and Secure ➔ Seismic resistance and fire proofing of the city ➔ Measures taken against torrential rain via regulating reservoirs ➔ The promotion of self-help and mutual assistance via disaster preparedness, stocking emergency supplies, community disaster drills ➔ Measures taken against cyber-crime, stalking, domestic violence, and organized crime	The entirety of the 'Safe City' section, given the name works towards the safe goals of the targets set in SDG 11 in protecting the lives and assets of Tokyo residents from disasters and is full of dynamism and bustle. Working towards a city that is safe for all during times of stress and in the face of any possible disasters both natural and man-made. ➔ The removal of utility poles – Prevent obstruction of roads during disasters ➔ The creation of a city that does not collapse or burn, an earthquake resilient city that is seismic and fire resistant ➔ The use of disaster drills to enhance community disaster preparedness ➔ The management of flood disasters, use of regulating reservoirs as torrential rain counter measures ➔ The maintenance and renewal of urban infrastructure	Chapter 03 – Urban Biodiversity and Greenery ➔ Green spaces and parks also create areas of safety during times of disasters and serve as fire breaks Chapter 04 – Clean and Comfortable Air ➔ Clean air stands for a safer environment to live in as particles in the air are constantly monitored

	Strategy 5 – Supportive Environment ➔ The option to have access to medical care for all creating a safer and more comfortable environment for all including that of home care Strategy 7 – Sustainable City ➔ The development of a residential safety net specifically for those who are in need of support.	➔ Counter terrorism measures specifically during the Tokyo 2020 Games ➔ Community Development in the Tama Area and Tokyo Islands ensuring citizen safety	
Resilient ➔ A cities capacity to cope with disasters ➔ Development of resilient infrastructure to protect the lives of citizens and sustain it more economically	Strategy 1, 4, and 7 contain forms of resilience to be taken in moving forward Strategy 1 – Tokyo 2020 Games ➔ The development of crisis management systems to aid in earthquake recovery Strategy 4 – Safe and Secure ➔ The creation of a seismic and fire-resistant city along with water resistance in lowland and waterfront areas by developing more resilient infrastructure against disasters Strategy 7 – Sustainable City ➔ Measures taken against climate change and summer heat in the form of cooling mist systems and greenery to make the city more comfortable and resilient against warmer temperatures	Aspects of the 'Safe City' section demonstrate resilience in terms of the physical environment. ➔ Creating a city that is seismic and fire resistant – an earthquake resilient city via its infrastructure. Protecting its citizens lives and economics	Chapter 01 – Climate Change and Urban Energy ➔ All of the building policies are a form of resilience to climate change and more Chapter 02 – Sustainable Materials and Waste ➔ Coping with disasters also refers to the management of food in such cases; in reducing and preventing the amount of food wasted that can aid in a disaster

Sustainable ➔ Human life, therefore large urban areas are inseparable to the wide variety of physical circumstances both natural and man-made ➔ Creation of a vital, sustainable, and supportive system for all ➔ Use of energy efficiently	Strategy 1, 7, and 8 have sustainable aspects to them. Strategy 1 – Tokyo 2020 Games ➔ The use of the Olympic village to be used as a smart energy city model via green spaces, the use of hydrogen, and long-lasting infrastructure to be used even after the games. Strategy 7 – The creation of a sustainable City ➔ ZEB – Zero Energy Buildings – Energy Efficiency and the use of renewable energy ➔ The maintenance and renewal of infrastructure in the hopes to extend the life of all infrastructure ➔ Passing greenery down to the next generation – parks and green spaces both public and private Strategy 8 – Tama Area and Islands ➔ The preservation of the natural environment in conveying the natural charm of theses areas	The 'Smart City' section focuses mainly on the creation of a leading global city, a vibrant city that keeps growing, leading the world in environmental policies and a global financial and economic centre which is relatable to the goal of SDG 11 making cities sustainable. ➔ Smart Energy City via the use of LEDs, hydrogen, eco houses, zero energy buildings and the use of energy saving measures ➔ A city close to nature with access for all to parks and green spaces and the preservation of the natural environment ➔ The advancement of environmental policies	A majority of this policy is sustainability related given it focuses on the environment. Chapter 01 – Climate Change and Urban Energy Sustainable Building Policies ➔ Policy 1: World's first urban cap-and-trade program for large facilities ➔ Policy 2: Carbon reduction reporting program for small and medium facilities ➔ Policy 3: Green building program ➔ Including the expansion of renewable energy in harmony with Tokyo's characteristics – Solar Energy ➔ The creation of a hydrogen-based society Chapter 02 – Sustainable Materials and Waste Management ➔ Sustainable use of resources ➔ Reduction of food waste ➔ Recycling of incinerator ash ➔ Super eco-town project to be based by the waterfront Chapter 03 – Urban Biodiversity and Greenery ➔ Conservation and preservation ➔ The creation of greenery in parallel with urban development Chapter 04 – Clean and Comfortable Air

			➔ Air quality management via two programs 1. VOC control advisor dispatching program 2. Air pollution monitoring system ➔ Automotive emissions regulations

5.5.1 Assessment of Policy Documents

Creating the Future: The Long-Term Vision for Tokyo is focused and driven on the key concerns for Tokyo; with eight strategies introducing eight areas which are considered a priority in Tokyo and the approaches planned to be taken. Each strategy not only describes plans for action in achieving its set goals but also what has been accomplished so far; it is a clear and concise document with language that is easy to comprehend. Implemented in 2014, before the implementation of the SDGs in 2015 it demonstrates that 'prior to the formulation of the 2030 Agenda, Japan was already implementing measures in an integrated manner to build a sustainable society through environmental, economic and social improvements' (UN, 2015) No accomplishment or minor form of success of a plan or policy is to small as it is one step forward to a sustainable future, in the case of this document which can be read in greater detail at the beginning of the results section the targets set may seem miniscule but the add up to a bigger picture and lead to the implementation of more policies.

An example of some of the targets which have been met in this document include the following:

- Set to be complete in 2020 was a barrier free design of the areas surrounding the games and areas for sightseeing, however this has already been completed and created an ease of access for all people.
- Set to be complete in FY2023 is the installation of platform gates in all 78 stations, this is written as a project that is almost complete.
- The development of the thee ring expressway has reduced traffic congestion.
- The extension of bridge service life includes a total of 160 bridges currently undergoing this measure and a total of 11 bridges over the Sumida River life extension have already been completed.

These are just a few of the targets which have already been met or are soon to be complete, there are a few more described in section 5.1.1 above. Nonetheless, the approaches discussed are moving forward and the future vision for Tokyo is underway.

New Tokyo. New Tomorrow. The Action Plan for 2020 was implemented in 2016 and consists of three core chapters under the different cities of Tokyo that of safe, diverse, and smart followed by strategic information. This plan is built on the Long-Term Vision for Tokyo document and goes into greater detail on many of the same issues with a minor amount added due to experience with previous approaches taken and concerns that may have arisen over the period between these two documents. 'The plan builds on the approx. 360 policy targets of the Long-Term Vision for Tokyo, raising the number of targets to approx. 500', to begin with 360 targets is a high number to reach but moving forward and increasing this number to 500 creates an extremely high standard to be met; the SDGs add up to 169 targets which is far below what Tokyo has set for itself. In the hopes of becoming a leading global city Tokyo is clearly pushing itself forward at as fast and efficient a pace as possible.

A key part added in this document, also mentioned above in section 5.3.5 is the implementation of the PDCA cycle allowing for the TMG to properly manage the progress of its polices and many targets. To be used from the beginning of all plans being formulated to the final stages of the action that was taken to achieve said plan or policy it works as an educational tool in the sense that it provides information on the experience of each individual target set. Therefore, can be used as a key source of information for Tokyo and other cities to learn from or adapt to their specific needs. Some of the achievements so far are as follows:

- About 7% of the utility poles have been removed in Tokyo so far

- Due to an increase in the availability of facilities the number of children in day-care has increased by 14,192 as of April 2016

More of what has been done so far and what is being worked on can be found above in section 5.1.2.

Each of the three cities of Tokyo are divided up into numerous sections focusing on specific areas which are in line with creating a safe, diverse, and smart city; many of which are extensions of the strategies found in the Long-Term Vision. It is a colourful document, designed to be easily understood and therefore allowing for a greater possibility of acceptance and action.

Finally, is the Tokyo Environmental Policy which is very much as in the name focused on the sustainability of Tokyo and therefore primarily related to the criteria of sustainability.

This environmental policy consists of exact policies, in different areas but all with sustainability and the environment as key components; each of the policies are described in detail in section 5.1.2 and request that all people be involved in one way or another in making them work. This includes people as individuals, public and private sectors, small, medium, or large facilities/companies in the Tokyo region and more. Examples of some of the successes from this document are as follows:

- CO2 emissions reduced by 13.3% below 2010 levels in 2014
- 11.1% of all the electricity used in Tokyo was generated by renewable energy
- The development of an extensive Air Pollution Monitoring System, with monitoring equipment at 82 locations in Tokyo for 24-hour continuous monitoring

These are among a few of many achievements listed in this document and as can be seen they are slightly more intense than the ones mentioned above for the Long-Term Vision for Tokyo in terms that they are more a global issue and specifically close to home as with the barrier free efforts made for those residing in Tokyo. This document provides a lot of information but in detail of areas of focus and with general information given about Tokyo allowing for a greater understanding to be achieved.

6. Conclusion

Tokyo is a developed city with resources available to aid it in becoming a leading global city and achieve targets set towards becoming an inclusive, safe, resilient, and sustainable. Successful cities always have a wealth of human energy that expresses itself in different ways and defines its own idiosyncratic space. To thrive, cities must attract smart people and enable them to work collaboratively. There is no such thing as a successful city without human capital. (Glaeser, 2011) Human capital has the potential to achieve set goals or targets to create a more sustainable society. While also having the opportunity to help developing countries or cities to achieve the SDGs or 2030 Agenda. This research was an examination of three of Tokyo's plans, polices and target documents in an assessment of their progress and urbanisation management and it demonstrated clear and concise plans for the future of Tokyo. Which, as mentioned above can be used by other global cities to learn from and adapt. The focus on SDG 11 owes to its obvious link to city-level policy implementation, but in practice many more of the targets from the SDGS are relevant at the city level; yet, 'while the contribution of local governments to SDG implementation is crucial to their success, there has been only very limited analysis of SDG implementation at city level so far' (Lucci et al, 2016, P.27) An examination into the plans and policies of the developed world, who have the opportunity to provide knowledge to the developing world and the future of urbanisation is essential. 'The opportunity is that 60% of the area expected to be urban by 2030 remains to be built, indicating that the shape of future cities can be proactively guided into more risk sensitive development', with the experience of Tokyo and its development and further research into developed cities like Tokyo proactive guidance could be provided to aid future cities (UN-Habitat, 2016, P.67)

6.1 Discussion

With the 21st century becoming the urban century, cities are offering both great opportunities and deep challenges deeply rooted in sustainability as they produce a high level of pollution, consume large amounts of energy and, given their high concentration of people, they are vulnerable to the human, social, and economic loss caused by climate change and natural disasters. The management of urbanisation processes is therefore critical and gives a window of opportunity for the future specifically for the developing world; 'how urban growth is managed in the developing world, the type of infrastructure that is put in place and the jobs and city economies that are developed will be crucial to sustainable development for decades to come' (Lucci et al, 2016, P.7) The progress and successful urbanisation management of a developed city such as Tokyo can provide beneficial data to the developing world, along with support for the creation of a sustainable future. Japan will support developing countries in aiding them in their formulation of national strategies alongside the SDGs. In August 2016, the sixth Tokyo International Conference African Development was held in Africa, working towards the implementation of the 2030 Agenda Japan committed to investing approximately 30 billion USD under public-private partnership for the future of Africa. (MOFA, 2017) There has been very limited analysis of SDG implementation at city level so far, but it is crucial to reflect on how cities can implement as an ambitious a goal as the SDGs, including SDG 11.

With many global cities unprepared for the challenges associated with rapid urbanisation, an examination of the plans, policies and action taken in a developed country who has been gradually and successfully implementing the 2030 Agenda into its national strategies is critical. In this case, it involved an examination of Tokyo and its plans; a city which demonstrates the ability humanity has in reshaping the natural environment. Yet, the

realisation has finally come about and is being accepted increasingly at a global rate that instead of controlling the environment for the benefit of the population perhaps it is time to control the population to allow the survival of the environment. Tokyo has adapted to this thought, as urbanisation growth continues areas of greenery are required to grow alongside it while protecting all remaining areas of the natural environment in the city. The three documents taken and examined from the TMG demonstrate a forward movement, all of them follow the same theme in creating a more sustainable future for Tokyo. Many of the same points are mentioned and repeated in each of the documents, expanding with more information in relation to the natural environment, natural/man-made disasters, an aging population, lack of space, energy efficiency, air quality management, greenery, hydrogen and so many more areas are examined in each of the documents. Not only do these documents consist of the plans and polices to be implemented but also of the actions that have already been taken both completed and in progress, showing that Tokyo is progressing forward in relation to SDG 11 in creating a city that is inclusive, safe, resilient, and sustainable.

The plans and polices and their targets written, some of which in the first document examined, the Long-Term Vision for Tokyo were completed before the SDGs are written with the idea of the specific needs of Tokyo. Targeted at the main concerns and challenges facing Tokyo today and into the future; yet just as with the SDGs these plans and polices can be adapted to the specific needs of other global cities. Tokyo has the potential to provide beneficial knowledge to the developing world and offer guidance in what has worked for them and what has not. The government of Japan has put forward and is promoting the idea of a "Future City" initiative in anticipation of the future worldwide trend toward urbanisation; aiming to create urban cities and communities with sustainable economic and social systems. This initiative selects forerunner cities both inside and outside Japan which will lead in innovating socioeconomic systems to create successful cases that can provide insights and networking experiences. An initiative to implement the SDGs and address common challenges such as aging, environmental issues and more. (SDGs Promotion Headquarters, 2017) Therefore, an examination and better understanding of how a city such as Tokyo works and functions with its own plans and polices in contrast to criteria and targets taken from SDG 11 is critical for other global cities to learn from.

6.2 Concluding Comments and Suggestions for Future Research

According to Glaeser, 'Tokyo's size is manageable, and in many ways, it provides a model for many of Asia's growing megacities. Japan's bureaucrats may not be able to beat private venture capitalists, but they wisely allowed Tokyo to grow tall, and they built a superb transit system. The streets are clean and safe', the city may never rival the likes of New York or London as a mecca for worldwide talent. (2011, P.226) But Japan has an abundance of smart, well-educated people and as long as they keep coming to Tokyo, it will remain one model of a successful city; a dense city that goes as far as the eye can see in Image 2 below. 'The size and pace of activity in Tokyo can be overwhelming, but at the human scale the city has an incredibly rich layering of experiences over generations' (Davis, 2018)

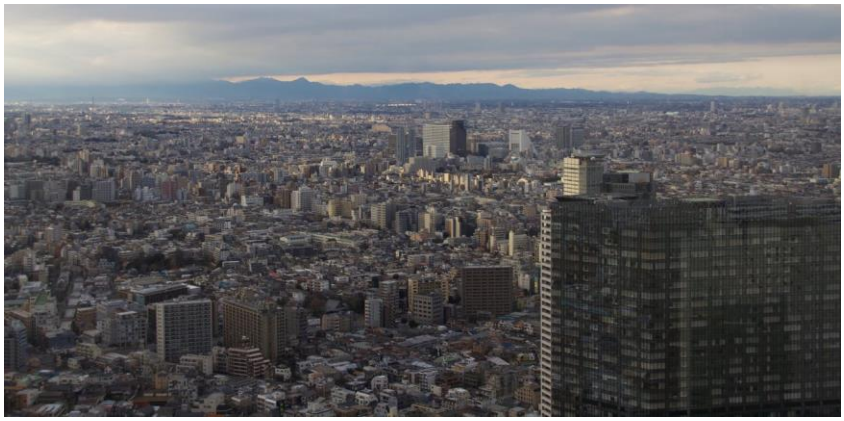


Image 2. Tokyo

As cities are uniquely placed to harness their human and environmental potential they can help guide urban growth towards greater social and environmental equity demonstrating a need for future research into the workings of global cites. As cities grow, their challenges change, and new information will constantly be needed to keep up with constant global changes in the form of risk assessment, economic, social, and environmental assessment, the workings of different levels of governments and more. Therefore, future research is necessary in creating more models of successful cities; it is remarkable over the past ten years how much global cities have changed and how much the challenges facing them have developed. There is a need to continue to explore how best we can work with our cities, whether to retrofit or rebuild, whether to centralise or devolve. Questions which will always bring different answers showing how important it is to keep asking them. (Sudjic, 2011)

Acknowledgements

There are a few people that I would like to acknowledge and express my utmost gratitude to in terms of encouragement, advice and support throughout the writing of this paper.

To my family and friends for believing me and the constant encouragement throughout.

With a special thanks to my good friend Emelie Lundell, who listened, encouraged, and helped me make sense of my own thoughts along the way. Your support helped me in the completion of this paper and would not have been possible without it. Thank you for listening to me!

To my supervisor Malin Hansen, who not only provided me with information and guidance in relation to the writing, methodology and over all research but also provided mental support, personal insight, inspiration, constructive feedback, providing academic articles and informative lectures to attend. Thank not only for the academic support but for just checking in on me.

Finally, thank you to my evaluator Tigran Haas for taking the time to give your input on the paper before finalisation.

References

Anneroth, M., et al, 2012, The Three Ages of Megacities, Networked Society, Ericsson

Bryman, A., 2012, Research Design, Comparative Design, 4th edition, Social Research Methods, Oxford, Oxford University Press, pp. 72-74

Davis, A., 2018, Lessons in Living Heritage from Tokyo to Adelaide, Available at: http://theconversation.com/lessons-in-living-heritage-from-tokyo-to-adelaide-52957 Accessed on: 24/05/2018

Evans, B., et al, 2005, Governing Sustainable Cities, London, Earthscan

Fabre, E.A., 2017, Local Implementation of The SDGs & The New Urban Agenda, Towards a Swedish National Urban Policy, Global Utmaning

Farquhar, J.D., 2012, Case Study Research for Business, SAGE Publications Limited

Fuller, R., 2001, Professional Practice for Sustainable Development, Journal of the Institution of Environmental Sciences, Vol. 10, No.1, pp.1-16

Glaeser, E., 2011, Triumph of the City, How Our Greatest Invention Makes Us Richer, Smarter. Greener, Healthier, and Happier, United States, Penguin Books

Glaeser, E.L., 2012, The Challenge of Urban Policy, Journal of Urban Policy Analysis and Management, Vol. 31, Issue 1, pp.111-122

Kalan, J., 2014, Think Again: Megacities, Foreign Policy, No. 206, pp. 69-73

Khanna, P., 2010, Beyond City Limits: The Age of Nations is Over. The New Urban Era Has Begun, Foreign Policy, No.181, pp.120-123, 126-128

Kotkin, J., 2005, Will Great Cities Survive? The Wilson Quarterly, Vol.29, No.2, pp.16-27

Lucci, P., et al, 2016, Projecting Progress: Are cities on track to achieve the SDGs by 2030? Overseas Development Institute, London

Ministry of Foreign Affairs of Japan (MOFA), 2017, The 2030 Agenda for Sustainable Development and Japans Implementation, Available at: http://www.mofa.go.jp/files/000252817.pdf Accessed on: 24/03/2018

National Geographic, 2018, Ring of Fire, Available at: https://www.nationalgeographic.org/encyclopedia/ring-fire/ Accessed on: 28/02/2018

Parker, D., 1995, Hazard Vulnerability of Megacity Environments, The Royal Geographical Society, Vol.27, No.2, pp.164-166

Richie, D., 2010, Tokyo Megacity, Tuttle Publishing, United States

Sato, H., et al, 2005, Earthquake Source Fault beneath Tokyo, Science, New Series, Vol.309, No. 5733, pp.462-464

Sudjic, D., 2011, Urban Age 10, London, Available at: file:///C:/Users/Nicola/Downloads/Global_Debates_Broadsheet.pdf Accessed on: 24/05/2018

SDGs Promotion Headquarters, 2017, Japans Voluntary National Review: Report on the implementation of the Sustainable Development Goals, Available at: https://sustainabledevelopment.un.org/content/documents/16445Japan.pdf Accessed on: 28/04/2018

Tokyo Metropolitan Government (TMG), 2014, Creating the Future: The Long-Term Vision for Tokyo (Simplified Version), Available at: http://www.metro.tokyo.jp/english/about/vision/index.html Accessed on: 04/02/2018

Tokyo Metropolitan Government (TMG), 2016, New Tokyo. New Tomorrow. The Action Plan for 2020, Planning Section, Planning Division Office of the Governor for Policy Planning

Tokyo Metropolitan Government (TMG), 2017, Creating a Sustainable City: Tokyo's Environmental Policy, Environmental Policy Section, General Affairs Division, Bureau of Environment, Environmental Document No. 29020

Tokyo Metropolitan Government (TMG), 2018, Tokyo's History, Geography and Population, Available at: http://www.metro.tokyo.jp/ENGLISH/ABOUT/HISTORY/history02.htm Accessed on: 28/02/2018

United Nations (UN), 2014, World Urbanisation Prospects: The 2014 Revision, Department of Economic and Social Affairs

United Nations Office for Disaster Risk Reduction (UNiSDER), 2015, Sendai Framework for Disaster Risk Reduction 2015-2030, Available at: https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf Accessed on: 28/03/2018

United Nations (UN), 2015, High-Level Political Forum 2018 (HLPF 2018), Sustainable Development Knowledge Platform, Department of Economic and Social Affairs, Available at: https://sustainabledevelopment.un.org/hlpf/2018 Accessed on: 03/05/2018

United Nations (UN), 2015, Japan. Voluntary National Review 2017, Japans efforts toward achieving the SDGs through PPAP, Public Private Action for Partnership Available at: https://sustainabledevelopment.un.org/index.php?page=view&type=6&nr=30&menu=139 Accessed on: 28/04/2018

United Nations (UN), 2015, Sustainable Development Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable, Targets and Indicators, Sustainable Development Knowledge Platform, Department of Economic and Social Affairs, Available at: https://sustainabledevelopment.un.org/sdg11 Accessed on: 04/02/2018

United Nations Human Settlement Programme (UN-Habitat), 2006, State of the Worlds Cities Reports, Available at: file:///C:/Users/Nicola/Downloads/State%20of%20the%20World%E2%80%99s%20Cities%2020062007.pdf Accessed on: 05/02/2018

United Nations Development Programme (UNDP), 2015, Sustainable Development Goals, Available at: http://www.undp.org/content/dam/undp/library/corporate/brochure/SDGs_Booklet_Web_En.pdf Accessed on: 06/02/2018

United Nations Human Settlement Programme (UN-Habitat), 2016, Urbanisation and Development: Emerging Futures, World Cities Report 2016, Available at: https://unhabitat.org/wp-content/uploads/2014/03/WCR-%20Full-Report-2016.pdf Accessed on: 05/02/2018

United Nations Human Settlement Programme (UN-Habitat), 2016, Sustainable Development Goal 11, Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable, A Guide t Assist National and Local Governments to Monitor and Report on SDG 11 + Indicators, Available at: http://localizingthesdgs.org/library/60/SDG-Goal-11-Monitoring-Framework-A-guide-to-assist-national-and-local-governments-to-monitor-and-report-on-SDG-goal-11-indicators.pdf Accessed on: 24/03/2018

United Nations (UN), 2018, Sustainable Development Goals, 17 Goals to transform our world, Goal 11: Make cities inclusive, safe, resilient and sustainable, Facts and Figures, Available at: https://www.un.org/sustainabledevelopment/cities/ Accessed on: 05/02/2018

United Nations Development Programme (UNDP), 2018, Sustainable Development Goals, Available at: http://www.undp.org/content/undp/en/home/sustainable-development-goals.html Accessed on: 18/02/2018

Appendix

Tokyo – A Brief History

Tokyo! Originally named Edo the centre of politics and culture of Japan that grew into a huge city with a population of over a million by the mid-18th century. The Edo period lasted for over 260 years until the Meiji restoration, imperial rule was restored, and the Emperor of Japan moved to Edo. It was renamed Tokyo in 1872 and became the new capital of Japan strongly influenced by westernization; construction began to be done on buildings with brick and stone instead of the traditional wood styles.

Brief History of Tokyo, Japan!

1869 – Japans first telecommunications line opened between Tokyo and Yokohama

1872 – The first steam locomotive started running between Shimbashi and Yokohama

1885 – Cabinet system of government was adopted, Ito Hirobumi became Japan's first Prime Minister

1889 – Promulgation of the Constitution of the Empire of Japan, establishing a political system of a modern state

Life in the city of Tokyo began to improve, the educational system excelled with girls now attending school.

September 1923 brought the devastating Great Kanto Earthquake which destroyed the Ginza area burning he city centre to the ground; 140,000 people were reported missing or dead and 300,000 houses were destroyed. It was in a sense an historical learning moment which resulted in a modernization program for a city developing above one of the world's most active seismic zones. A city construction plan was developed but was unable to be completed for the entirety of the city due to lack of financial resources at the time.

1931 – Haneda Airport was completed

1935 – Population of Tokyo grew to 6.36 million people

1941 – Port of Tokyo opened (MORE INFO! CLOSED FOR OVER 200/300 years to the rest of the world) The Pacific war broke out and had a great impact on Tokyo

1943 – The Metropolis of Tokyo was formed, the dual administrative system of Tokyo-Fu (prefecture) and Tokyo-shi (city) was abolished in attempt to be more efficient for the war time

Tokyo was bombed 102 times during the final phase of the war, with the heaviest air raid occurring on March 10th, 1945. By the end of the war Tokyo had been laid to waste and the population had fallen to 3.49 million, half its level in 1940.

1947 – The New Constitution of Japan and the Local Autonomy Law took effect with Seiichiro Yasui elected as the first governor of Tokyo.

August 1947 – The present 23 special ward systems began

1953 – Television broadcasting began

1956 – Japan joined the United Nations

1960s – Japan entered a period of rapid economic growth

1962 – The population of Tokyo broke the 10 million mark.

1964 – Olympic games were held in Tokyo, the Shinkansen (Bullet Train) line began operation and the Metropolitan Expressway opened; forming the foundation for Tokyo's current prosperity

1970s – The strain of economic growth became visible as they country was beset with environmental issues

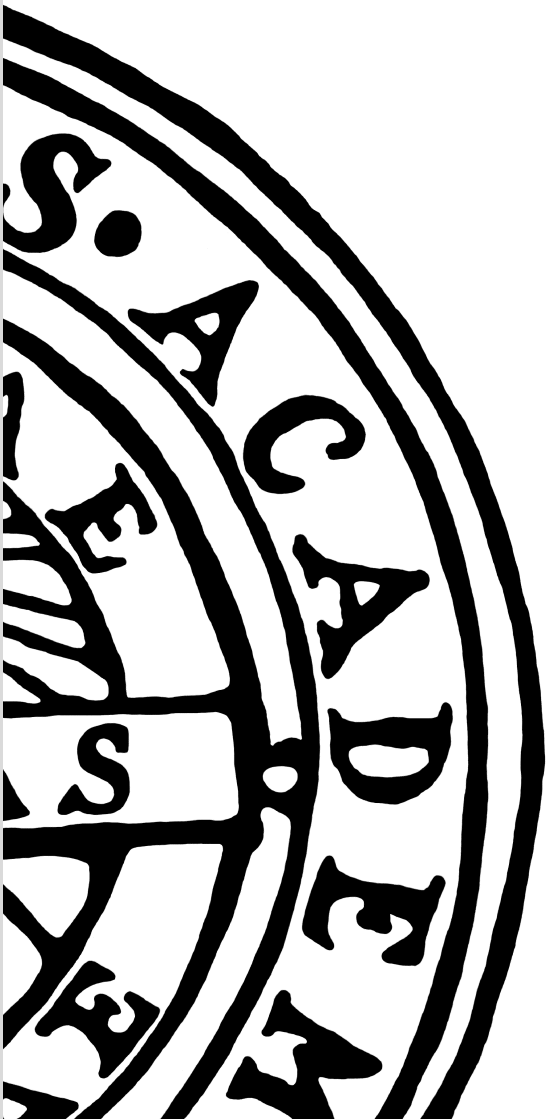
1973 – Oil Crisis

1986 brought what was known as the 'bubble economy' which began with large steps in economic growth as stock prices spiralled upwards, but this bubble eventually burst in the beginning of the 1990s leading financial strains for the city.

1997, for the first time in 12 years in-migration exceeded out-migration and by 2001 the population of Tokyo reached 12 million people; by 2010 it surpassed 13 million.

2011 was the Great Japan Earthquake and it became clear that Tokyo needed to strengthen its Crisis Management System. (SAFETY)

Tokyo's population is projected to start declining once it reaches its peak in 2020, it is projected to become an aging population. 'Though Tokyo has thus been destroyed and reconstructed twice in the twentieth century, it remains essentially a city of wooden buildings with streets needed to be widened to allow more access; which is off great importance during times of emergency. (Planning in Tokyo)


ACADEMY
S.