SMART CITIES IN JAPAN AND THE EU: IN SEARCH OF STRUCTURAL FOCAL POINTS IN RESPECTIVE POLICY DEVELOPMENT

Kie Sanada

Stockholm School of Economics

Abstract. Recently, the EU and Japan have taken international cooperation measures to join hands in their smart city initiatives. From the perspective of smart cities as a matter of political governance, this article highlights the characteristics of smart city initiatives in Japan and the EU in terms of their policy development. On this basis, the author seeks to identify focal points where their policy interests converge. What becomes apparent are differences in their original policy concerns and envisioned social innovations, as well as similarities in policy development to promote citizen participation through community building. They share a policy process structure that involves decentralized administration and competitive financial distribution through regional policy schemes. The conclusion argues that this structure may contribute to widening the existing domestic spatial injustice, justified with the neoliberal rhetoric of competence and concealed with a global sustainability narrative.

1. Introduction

In the wake of the twenty-first century, the idea of the smart city has become a central agenda in urban (re)development worldwide. The global trend of its conception and implementation continues to grow. The size of the global market related to smart cities is estimated to increase from around 1 trillion USD in 2020 to 2.5 trillion USD in 2025 (PwC 2019 in OECD 2020) and to 50 trillion USD by 2050 (Future Cities Catapult 2017 in Alizadeh 2021). In particular, with the pressing need to address the issues of climate change and societal challenges, the European Union (EU) and Japan share a strong interest in the concept of smart cities with strong socio-economic and geographical cohesion. Japanese interest is formulated in its effort to realize the new societal model – *Society 5.0* (2016) – while the EU's interest is shaped by *the European Green Deal* (2019) and *REPower* (2022). The shared interest between the EU and Japan is anchored *in the Paris Agreement* (2015) and concretized in a number of bilateral agreements. *The EU-Japan Strategic Partnership Agreement (SPA) 2018* highlighted the need for bilateral cooperation to advance the transition to a circular economy and climate neutrality. The following *EU-Japan Green Alliance 2021* promised to strengthen collaboration on research and development (R&D) in the prioritized area of smart cities to enhance decarbonization and secure sustainable and clean energy supply locally. The energy sector is appointed as the key target for investment (Zappa 2022). In 2022, the EU and Japan further agreed to collaborate on R&D of digital technologies through signing *digital partnership*.

Given such rapid-paced and large-scale dynamism, it is an urgent task for social sciences to reflect on its social implications by asking how this dynamism took shape, what the emerging focal points are, and how it would affect our lives. However, contributions from the field of social sciences on this topic remain outnumbered. In fact, the majority of existing studies, particularly in the field of engineering, have treated social innovation and technological advancement as if they equate in promoting and legitimizing smart city investment (Kim, Sabri, and Kent 2020, Luque-Ayala and Marvin 2019). In this formulation, a set of societal issues at hand in a given locality are presented as if they are detached from their geographical and historical context and reinterpreted as globally shared targets of technical troubleshooting. Societal futures from this perspective are aspirational, experimental, and uncertain (de Waal and Dignum 2017, White 2016), and they are infiltrating and dominant. A critical body of social research has warned of the risks of such constructs and called for serious social scientific attention from a perspective of viewing smart cities as a matter of governance (Alizadeh 2021, de Waal and Dignum 2017, Hollands 2008, Kim et al. 2020, Kitchin 2015, Visvizi and Lytras 2019, White 2016). This paper aims to contribute to this research trend from a perspective of examining smart cities as a matter of political governance.

The following part of this article is structured as follows. Firstly, I will introduce the heterogeneity that the conception of the smart city witnesses. The following section will give a brief summary of the current state of social research. After clarifying the research questions and theoretical background of this article, I will

proceed to trace the policy development of smart city initiatives in Japan and the EU, respectively. This will lead to highlighting structural focal points in smart city cooperation between the EU and Japan as the conclusion of this article.

2. Heterogeneous formulations of smart city initiatives

In the promotion and legitimization of investment, international and governmental organizations, as well as private vendors, have described smart cities under their unique conceptions. This has resulted in a variety of existing descriptions of smart cities among promoters. For instance, the European Commission (n.d.a) conceptualizes a smart city as a place where traditional networks and services are made more efficient with the use of digital solutions for the benefit of its inhabitants and businesses. Among its member states, giving a few examples, the German Federal Ministry of the Interior and Community (2022) defines the term smart cities as referring to the development and use of digital technologies in almost all areas of local life "...to serve the objectives of sustainable and integrated urban development in the public interest". The Government Office of Sweden (2016) defines smart cities as using "information and communication technologies to improve the quality, performance, and interactivity of municipal services, reduce costs and resource consumption, and improve contact between citizens and authorities". The Estonian government (2019) defines smart cities as the "meeting point between...digital transformation, environmental issues, [and] economic performance" to "make urban agglomerations more inclusive, efficient, and attentive toward environmental issues". On the other hand, Japanese smart cities are "sustainable cities and regions, which solve challenges faced by cities and regions", which "continue to create new value" by providing services tailored to individual citizens using new technologies and various types of data from the public and private sectors, and by upgrading management in various fields (CAO 2021).

In addition, much has been written on smart cities by academics as well as researchers employed in commercial, governmental, and international organizations. This existing literature witnesses the heterogeneous and multi-dimensional descriptions of smart cities. The heterogeneity arises from the combination of various factors, such as anchored technologies and infrastructures, visions and objectives, promoting actors and financial sources, governing style, and so on (de Falco et al. 2018, Sakuma et al. 2021). Moreover, each publication represents the idea of smart cities in accordance with the purposes of the study, disciplinary orientations, and perspectives taken by the authors (Kitchin 2015, Mora et al. 2019). Therefore, the scientific definitions of smart cities are, as it stands, diverse and heterogeneous. Against this backdrop, there is a growing consensus among social scientists that there is no *one-size-fits-all* definition (Albino et al. 2015, Bibri and Krogstie 2017, Kitchin 2015). Instead, every smart city operates differently in practice as it is a glocal phenomenon (Dameri et al. 2019). The normative idea of the smart city gets localized in accordance with a given politico-historical context in dealing with locally

specific issues within different institutional settings at hand. Furthermore, such local conditions are subject to change through time and space. Thus, the definition of a smart city will necessarily remain elusive. Against this background, a number of unique empirical case studies have been published. Notably, case studies from the countries of the so-called *global south* have challenged the field of study, which has long been dominated by case studies from Europe and other high-income countries (Alizadeh 2021, Datta 2015, Shin 2016).

3. Human centric shift in smart city research

The scientific discussions regarding smart cities have mainly revolved around digital infrastructures and social innovations via data-driven solutions. The majority of existing research on smart cities was published in the field of natural sciences, particularly in the fields of engineering and Information and Communication Technologies (ICTs) (Kim et al. 2020, Sakuma et al. 2021, Visvizi and Lytras 2019). An expectation that technological and infrastructural updates will eventually result in augmenting economic performance and social innovation in a given city is often embedded in these studies (Kim et al. 2020, Luque-Ayala and Marvin 2019). Certainly, these views, held in the natural sciences, are an important driving force for the development of smart city initiatives worldwide. However, the societal future they depict is, in fact, normative, aspirational, entrepreneurial, utopian, and ultimately uncertain (Datta 2018, de Waal and Dignum 2017, Jasanoff and Kim 2015, Shin 2016, White 2016).

From the early stages, social sciences have critically examined the social impact of smart cities from a perspective of its governance, both theoretically and empirically. In this vein, critical social studies from the early 2010s rejected the first generation of smart city initiatives, namely *smart city 1.0*, which is characterized by technocratic, profit-driven, top-down, and supply-based governance. These studies called for a paradigm shift to the so-called *smart city 2.0*, characterized by participatory and user-driven governance, aiming to co-create solutions for locally specific societal issues in a bottom-up manner (Caragliu et al. 2011, Chourabi et al. 2012, Hollands 2008, Kitchin 2015). The call seemed to have triggered a discursive shift among smart city promoters from the public sector and private vendors "to reflect more human-centric objectives" (Sakuma et al. 2021: 1778) and "to embrace narratives of citizen engagement and inclusivity" (Trencher 2019: 118). However, this shift may only be at the discursive level (de Waal and Dignum 2017). This doubt is supported by the latest studies that continue to raise alarms about the neoliberal business interests rooted in the management of smart cities (Sadowski and Bendor 2018, Visvizi and Lytras 2019, Voorwinden 2021). Besides, its technocratic political governance continues to prevail in Japan (Granier and Kudo 2016, Zappa 2020) and in European countries (Bibri and Krogstie 2017, Engelbert et al. 2019, Grossi and Pianezzi 2017). According to Shin (2016) and Datta (2015), this occurs because existing political structures and institutionalized neoliberal and technocratic rationales continue to

operate in the policy process of smart city initiatives, regardless of the discursive shift. The majority of public bodies prefer to rely more or less on private partnerships in order to compensate the lack of expertise to implement technological- and digital-infrastructures and data-oriented solutions (Voorwinden 2021). However, as long as the smart city initiative is promoted by the public bodies for bringing solutions or enhancing improvement of the existing societal issues, a perspective to grasp the smart city initiatives as a matter of political governance, rather than of cooperate city management, is necessary. This is to bring back the political responsibility of a given governing polity to guarantee social justice and democratic fairness at the center of our discussion of smart cities.

4. Research questions and theoretical framework

This article aims to pinpoint an emerging focal point in the accelerating alliance in smart city development between the EU and Japan. For this purpose, I ask the research questions "what are the characteristics of smart city initiatives in Japan and the EU in terms of their policy development respectively?" and "on what grounds do their policy interests meet?" Answering these questions leads to identifying a structurally rooted focal point of smart cities in the EU and Japan.

These research questions are formulated from a Bourdieusian theoretical perspective. Contrary to how the promoting discourse of smart city expects, the Bourdieusian theory of practice teaches us that a normative representation of smart city cannot be taken at face value (Bourdieu 1990, Rehbein 2018, 2020). Instead, each smart city must be viewed as an extension of the history of political governance in the locality. This is because smart city initiatives do not create a brand-new governing structure, nor do they simply undo the historicity and local specificity of existing social realities (Brenner and Theodore 2002). Instead, what actually prevails are the rationalized practices institutionalized in the existing policy process. The normative idea of smart city will be appropriated into the local spatio-temporal specificity via the existing institutional settings and practiced both at the micro and macro level. What is significant to remember in this theoretical perspective is that the normative construct of smart city cannot be rejected as a mere label. Instead, it recognizes its ideological efficacy. The normative idea of smart city represents a set of societal issues at hand as if they are detached from their geographical and historical context and reinterpreted as globally shared targets of technical troubleshooting. Blind faith in technical solutions runs the risk of misrecognizing their experimental nature. In fact, it is uncertain whether they are the right experiments to solve local issues, and it is also uncertain if or how local societal issues are related to certain global challenges. From a post-institutionalist perspective, it is questionable whether anyone can plan a meaningful experiment without determining the historical and local specificity of a given social challenge. Meanwhile, experiments take place in social reality anyway and exert real impacts on local livelihoods, justified with global concern for sustainability, climate neutrality, citizen wellbeing, and so on. In

short, Bourdieusian theories permit us to take both discursive constructs and locally specific social realities seriously and, on this basis, highlight structural mechanisms that bridge these two social practices.

Within this framework, the current paper endeavors to highlight an emerging focal trend in smart city initiatives in Japan and the EU in a historically informed manner. The research focuses on the recently agreed collaborative commitment between Japan and the EU, which is important because they are major players in global smart city investment and have joined hands. In 2022, the EU allocated 159 million euros, and Japan allocated 765 million euros to domestic smart city investment, respectively (Zappa 2022). These major investors recently signed a number of international agreements, such as SPA (2018)*,* EU-Japan Green Alliance (2021), and Digital Partnership (2022)*.* These collaborative measures will further enhance their presence as smart city investors in the global smart city sector. Thus far, research from the above-explained perspective that puts a focus on the strategic agreement of Japan and the EU has not yet been carried out. In this sense, this research will add new research results to the existing body of study. Answering the above-mentioned research questions will help identify the similarities and differences of smart city initiatives in Japan and the EU, and common discussion points in regards to social justice and democratic fairness. It also aims to provide practical implications for policy and decision-makers to formulate more effective political intervention to ensure the impact of their investment for the real achievement of socially sustainable, inclusive, and citizen-centered growth. The following part of the article traces the development of policy and the policy narrative of smart cities in Japan and the EU based on the information collected from existing scientific articles and publicly available documents published by governmental and semi-governmental organizations.

5. Case studies

5.1. Japan

While Zappa (2020) notes the long-standing concern of the Japanese central government regarding energy security, which emerged due to the oil crisis in the 1970s as a decisive background, Nomura (2017) finds one origin of smart city initiatives of the Japanese central government in the early 1990s, when the concern about environmental issues began to increase globally. In fact, these two issues are intertwined via the Japanese government's official understanding of nuclear energy as a clean energy due to its low carbon emissions. In other words, the Japanese policy narrative to promote nuclear energy and environmental protection largely overlaps with each other, at least until *the Great East Japan Earthquake and the Fukushima Daiichi Nuclear disaster* in 2011 (METI 2018). For instance, *the Nuclear Energy White Paper*, published in 1988, designated nuclear energy production as Japan's key strategy to balance stable energy supply and environmental protection; this view remains unchanged until today (JAEC 2021). In 1993, the Ministry of Construction,

which was later merged into the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), initiated *the environment-harmonious-ecocity project*. This project was designed to encourage local governments, which have more than 250 thousand populations, to engage in environmentally friendly city planning through the implementation of advanced technologies in terms of nature protection, low-carbon energy, waste management, security, and transportation for the purpose of augmenting citizens' well-being (MLIT n.d.a). The adoption of *the Kyoto Protocol* in 1997 led the Japanese government to enact *the Global Warming Countermeasures Promotion Act* (1998), which stipulated that industries, as well as local governments, were responsible for limiting carbon gas emissions. During the 2000s, while research and development of hydrogen mobility has been actively promoted in its industrial policy (Trencher et al. 2021), the central government continued to prefer nuclear power to stabilize the domestic energy supply (Zappa 2020). While global (Eurostat 2022) as well as domestic (FEPC n.d.) production of nuclear energy began to decline gradually but steadily since 2004, the Cabinet Office (CAO) initiated *the Model-Ecocity Project* in 2008 to encourage local governments to adopt the national agenda to invest in nuclear energy and carbon capture technologies. In 2009, turning away from nuclear energy for the first time under the new leadership of the Democratic Party of Japan (DPJ), the Council for Energy and Social Systems of the Next Generation was formed within the Agency for Natural Resources and Energy at the Ministry of Economics, Trade, and Industry (METI). The council promotes a low-carbon society, which enables the balance of the environment and economic development (METI 2022). Soon after, the council launched four large-scale pilot projects to install infrastructures of advanced technology such as e-mobility, smart-grid systems, and Energy Management Systems (EMS) in industry, business, and household activities in Kitakyushu city in Fukuoka, Keihanna city in Kyoto, Yokohama city in Kanagawa, and Toyota city in Aichi. Indeed, the original conception of Japanese smart city initiatives has been strongly marked as an infrastructure-driven policy of energy security with a narrative of environmental protection.

The earthquake and nuclear disaster of Fukushima in 2011 offered space and an opportunity for 'social experiments' in terms of the application of technological innovations that might eventually help Japan move from a 20th-century model of industrial and social arrangements to a 21st-century one (Zappa 2020: 205). Nomura (2017) also acknowledges that the catastrophe in Fukushima contributed to widening the scope of smart city initiatives from purely technologically inspired energy and environmental policies to include the issue of resilience via its community recovery plan. The United Nations (UN)' call for international commitment to adopting *Sustainable Development Goals (SDGs)* further inspired the Japanese government to include other societal issues, notably depopulation and aging society, in its scope (Zappa 2020). Aiming to enhance the employment of ICTs for dealing with these issues, the Japanese government announced the overarching model of society, i.e., *Society 5.0* in the *5th Science and Technology Basic Plan* in 2016. In this document, CAO (n.d.) defined this concept as "a human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates

cyberspace and physical space". These conceptual shifts, in fact, did not alter the political structure per se. In the Japanese case, it is rather the policy process in the field of regional governance that defines the objectives, the manners of application, and the impact of a given social conceptual shift.

Regional revitalization policy, also known as *local Abenomics*, is an ongoing regional policy scheme launched by ex-PM Abe (in office: 2012–2020) in 2014. This policy embodies the decentralization reform of regional governance, which was set forth at its height in the 1990s (Matsui and Araki 2020, Chiavacci and Lechevalier 2017). The current *City Planning Act (June 2020)* designates the central government as responsible for formulating guiding principles of city planning through the enactment of *Basic Plans*; the principle of regional revitalization policy is anchored in a number of annually revised *Town, People and Job Creation comprehensive strategies (2015–2021)* (hereafter referred to as the Strategy). Since the Strategy mentioned the concept of Society 5.0 for the first time in 2018, the contents of the regional revitalization scheme have rapidly become more technologically advanced. This has been made possible through defining the smart city as a place to realize Society 5.0. As the name of the Strategy implies, the preferred method of implementing regional revitalization is through town creation, in other words, *community building.* This is a civic-participatory scheme of regional governance that embodies the neoliberal principle of public management based on self-responsibility and self-regulation (Sanada 2019). As a result, smart community projects have emerged.

The central smart city initiative stipulated in the Strategy will be operationalized by different institutions at various political levels; hence, the contents of smart cities would diversify in the actual policy process. The central budget made available for smart city initiatives will be distributed among various central ministries to finance their own smart community initiatives, defined within a given ministry's mission. On this ground, each ministry launches smart city grant schemes and calls for local applications. According to the above-mentioned *City Planning Act*, local governments are not obliged to draw out their local city plan based on any central Strategies or Basic Plans; it is only recommended to settle the local city plan in line with the spatial planning at the prefectural and central level. However, if a given municipality wishes to access the financial allocation from the central government to compensate for the shortage of public finances, each municipal government must publish the municipality-specific Strategy. By 2016, 99.8% of municipalities had published their municipal Strategy (Nakamura and Takamatsu 2020 in Matsui and Araki 2020). Based on the municipality's Strategy, the municipal government must search for a fitting funding program, apply for available project grants in accord with the instructions of a given central ministry, and the method of implementation should be in a bottom-up manner, preferably with community building method as recommended by the central Strategy. This augments a given municipality's chance to win project grants, which are distributed on a competitive basis. In sum, the influence of the central Strategy on the local city administration is made attractive as financial schemes and pledged in its administrative process. Matsui (2017) calls

this decentralized way of governance: management through basic plans. In total, at least 230 smart community projects are currently ongoing nationwide on the basis of collaboration among the local municipalities, the central ministries, and other governmental agencies and private firms (MLIT n.d.b). These projects are diverse in their anchored technologies and infrastructures, visions and objectives, and promoting and financing ministries, while sharing a common policy framework to implement society 5.0 for regional vitalization. This is supposed, ultimately, to lead to achieving socio-economically and environmentally sustainable and resilient development of local communities in Japan as a whole.

Table 1, presented below, summarizes the policy developments concerning smart city initiatives in Japan. The original concept of smart cities in Japan was concerned with energy security and environmental issues through the implementation of advanced technology, particularly in terms of low-carbon energy. The catastrophe in Fukushima widened the scope of smart cities to tackle not only energy and environmental issues but also resilience. The adoption of SDGs provided the Japanese government with a narrative of sustainability, which brought together concerns of energy security, environmental friendliness, resilience, and other societal challenges. In order to bring technical solutions to these issues, the new model of society was conceptualized as society 5.0. However, the adoption of these new societal concepts did not alter the existing structure of the policy process per se. Instead, the adoption of *society 5.0* triggered the rapid smartification of domestic regional governance. Japanese smart city initiatives proceeded, taking advantage of the existing institutions, strategies, and know-how in the policy sphere of regional governance. The objectives, manners of application, and impacts of a given social conceptual shift are defined in the decentralized neoliberal structure of regional governance through the administrative procedures of financial allocation and the actual local effort of smart community building.

Table 1. Chronology of policy development of Japanese Smart City Initiatives

Year	Relevant major events	Japanese smart city policy	EU Smart city policy
1960–	Japan switches main energy source from coal to oil		
1973–	Oil crisis hightened the national concern in energy security		
1985	UNEP pressed concern on the global environmental issues		Smart urbanism
1990–	Internet and ICTs started to reach wider audiences		
1993	Decentralization became a keyword (Hosokawa Cabinet – JNP)	Environment Harmoneous Ecocity (MLIT)	
	EU was formed		
1997	Kyoto Protocol		

Year			
1999	The comprehensive law for decentralization The first dencetralization reform		
2002	Trinity Reform (Koizumi Cabinet -LDP)		
2008		Model Ecocity Project (CAO)	
2009	DPJ came to the power	4 Pilot Smart City Projects (METI)	2020 Climate and Energy Package
2010			Europe 2020 Strategy
2011	The Great East Japan Earthquake and Nuclear Catastrophe in Fukushima		German announcement of Industrie 4.0
			Smart Cities and Communities Initiative
2012	LDP returned as a ruling party		European Innovation Partnership for Smart Cities and Communities
			Smart Cities Marketplace
2014	Regional Vitalization Policy (Abe Cabinet -LDP)		
	National Grand Design 2050 (MLIT)		
2015	UN called for SDGs		
	Paris Agreement		
2016	National Grand Design 2050 (MLIT)		
2017		Smart Cities for Resolution of Local Issues (MIC)	
2018	EU-Japan Strategic Partnership Agreement	Society 5.0 appear in the Town, People, Job Creation Basic Plan 2018	
		SDG Future City (CAO)	
		Projects to Implement Future Technologies (CAO)	
2019	Global Pandemic of Covid-19	Regional vitalization policy intergrates Socety 5.0	European Green Deal
		Japanese MaaS Promotion Project (MLIT)	
		Smart City Model Project (MLIT)	
		Local MaaS Promotion Project (METI)	

2020		Regional vitalization subsidy -type Society 5.0 (CAO)	
2021	EU-Japan Green Alliance 2021	Local Decarbonization Promotion Subsidy (CAO)	
2022	Russian Invasion into Ukraine		REPowerEU Plan
	EU-JAPAN digital partnership		Energy Communities
	Digital Garden City Nation Basic Plan (Kishida Cabinet -LDP)	National Strategic Zone for Super City and Digital Health projects (CAO)	

Note: This table is prepared by the author based on various sources. List of acronyms:

CAO	Cabinet office of Japanese government
DPJ	Democratic Party Japan
EU	European Union
ICT	Information and Communication Technology
JNP	Japan New Party
LDP	Liberal Democratic Party
MaaS	Mobility as a Service
METI	Ministry of Economy, Trade and Industry
MIC	Ministry of Internal Affairs and communication
MLIT	Ministry of Land, Infrastructure, Transportation and Tourism
PM	Prime Minister
SDG	Sustainable and Development Goal
UN	United Nations
UNEP	United Nations of Environmental Protection

5.2. European Union

In Europe, the first appearance of the term *smart* in the context of city governance was found in discussions about smart urbanism in the late 20th century. In these discussions, smartness referred to the governing effort to overcome urban social problems, such as deteriorating environment and health issues, mobility, and urban sprawl, which were consequences of rapid urban growth driven by technological innovations (Harrison and Donnelly 2011, Kim et al. 2020, Kitchin 2015, Neirotti et al. 2014). Meanwhile, one of the first smart city initiatives emerged in the early 1990s when technological advancements in terms of the internet and ICTs reached wider audiences. This initiative was initiated by intellectual and political efforts to apply advanced technology infrastructures to increase economic efficiency, particularly in terms of energy management systems (Bibri and Krogstie 2017, Caragliu et al. 2011).

The EU was formally established in 1993, with a particular interest in fostering ICT-driven economic growth from an early stage (Caragliu et al. 2011, Kim et al. 2021). In 2009, the *2020 Climate and Energy Package* was enacted, encouraging the development of low-carbon technologies to transition to a greener and more efficient

energy infrastructure. The following year, the *Europe 2020 strategy* (EC 2010) placed the implementation of digital and ICT innovation at the center of achieving smart, sustainable, and inclusive growth. According to this document, smart growth refers to a knowledge and innovation-based economy, sustainable growth points to a resource-efficient, greener, and more competitive economy, and inclusive growth refers to an economy that promotes economic, social, and territorial cohesion. To meet the policy goals set in the Europe 2020 Strategy, the *Smart Cities and Communities initiative* was launched in 2011, aimed at fostering R&D, knowledge sharing, and collaboration between cities and industries, initially targeting only the energy sector with a budget of 81 million Euro. In 2012, the initiative expanded its scope to include the mobility sector and was renamed the *European Innovation Partnership for Smart Cities and Communities*, with a budget of 365 million Euro (Maschio 2022). This extensive effort to implement the Europe 2020 strategy contributed to the proliferation of the normative conceptualization of the smart city as a means of fostering environmentally sustainable economic growth through ICTs and other advanced technological infrastructures (Caragliu et al. 2011). In 2011, Germany announced a new model of economy – i.e., *industrie 4.0*, which aims at an overall 'digital transformation of manufacturing'. This new economic model was adopted by the EC in 2015 for its European-wide implementation (Smit et al. 2016), further implementing the conception of smart growth.

There are two channels of conceptions for smart cities: concerns on urban management and innovation-driven economic growth. These channels met via Goal 11 of the SDGs, announced by the UN in 2015 (UN n.d.). Cities occupy only 2% of geographical space on the globe but produce 70% of the total GDP. However, cities also consume 60% of energy, emit 70% of Greenhouse Gas, and produce 70% of waste, indicating the need to enhance urban economic activities and shift towards a sustainable way of living (UN 2015). *The UN Economic Commission for Europe* designated smart cities as a core strategy to achieve the tripod of economic growth, urban governance, and implementation of advanced technology in 2018 (UNECE 2018). The adoption of the SDGs has also triggered the smartification of regional policy in the EU. The *Cohesion Policy* of the EU received the biggest proportion of the budget, approximately 32.5%, between 2014 and 2020 (EC n.d.b). In the sequencing period between 2021 and 2027, the budget available for this purpose accounts for 330.2 billion Euro, which is approximately 30% of the regular long-term budget of the EU (European Council 2020). Among all the funds of the Cohesion Policy, the *European Regional Development Fund (ERDF)* is its main financial tool. In the period between 2014 and 2020, the ERDF aimed to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions (EC n.d.c). In the current funding period between 2021 and 2027, the ERDF has shifted its aim to enable investments in a smarter, greener, more connected, and more social Europe that is closer to its citizens (EC n.d.d). The ERDF has allocated a budget of 200.36 billion Euro for the current period, and 8% of the allocated resources at the national level will be designated to achieve sustainable urban development (European Parliament 2022).

Certainly, in the actual policy process, the EU's idea of the smart city project will be operationalized by different institutions at various political levels, be it at a national or local level. As a result, the actual contents of smart cities would diversify. However, the overarching governing discourse underpins public reasons in policymaking in various member states, and its influence in local projects is pledged in the administrative procedure of financial allocation, stipulated in Cohesion Policy legislation. The financial and administrative mechanisms in the decentralized policymaking structure, which are similar to what Matsui (2017) observed in Japan, are at work. If a given local project wishes to access the financial allocation from the EU level to compensate for the shortage of public finances, be it at the national or municipal level, the project members must assimilate the EU's smart city principle and formulate its project planning on this basis to augment its chance of winning project grants.

While it still largely remains an instrument to introduce e-infrastructures as tools of efficient urban governance and industrial management, the EU's smart city project has recently reinforced its focus on energy concerns. The European Green Deal (2019) has situated investment in clean technology at the heart of European economic development strategy. The Russian invasion of Ukraine in 2022 dramatically increased gas and oil-based energy prices in Europe. To reduce dependency on Russian fossil fuels, the EU presented a new scheme called REPower, which further strengthens its engagement promised in the European Green Deal, particularly through investment in energy-related technologies such as renewable energy, EMSs, and batteries. In order to enhance its energy resilience, the EU promotes decentralized energy provision at the community level, known as *Energy Communities*. In addition to these benefits, energy communities are expected to be beneficial in terms of regional development by generating businesses, employment, and tax revenue, promoting vital interactions and technological spillover effects, and building capacity and well-being in local communities (Buratti et al. 2022, Chatzichristos and Nagopoulos 2020). In the blueprint for decentralized energy provision, projects at local communities have become a key target for political intervention and financial investment (Bengo et al. 2015, Ko and Liu 2021, Nicholls 2010). In sum, energy communities are the latest key strategy to achieve these goals in a locally tailored and technically driven manner. The application call for project-based grants opened only in April 2023.

The original concept of the smart city in Europe was concerned with addressing urban challenges and fostering innovation-driven economic growth. SDGs served as a bridge between these two separately developed discourses, with the smart city project aiming to enhance economic activities and improve the quality of life in member state cities. Recently, the green transformation of the energy sector has emerged as a key strategy for policy intervention and financial investment. The EU has transitioned its governing goals accordingly, with financial schemes and administrative processes of regional policy being integral mechanisms to secure territorial cohesion. Similar to Japan, revenue redistribution in the EU occurs primarily through regional development policy. The original focus on smartification in industrial management and urban governance has now expanded to include the

green transformation of energy provision and consumption, with the ultimate goal of achieving economic growth driven by technological innovation.

6. Conclusion

What are the characteristics of smart city initiatives in Japan and the EU in terms of their policy development, respectively? From a comparative perspective, differences between Japanese and the EU smart city initiatives come to light. Firstly, they are different in their original concerns. Japanese smart community initiatives have their roots in energy security concerns. They developed in the promotion of low-carbon energy, hand in hand with the narrative of environmental protection. On the other hand, the EU smart city initiatives have mainly been concerned with fostering innovation-driven economic growth. Secondly, they differ in terms of the social innovation targeted through smart cities. Japanese smart community projects developed to bring technical solutions to societal challenges in urban and rural areas, such as resilience, sustainability, depopulation, aging society, and regional disparity. The EU smart cities aim to tackle mainly urban issues such as mitigation of environmental impact, poverty, and security via the installation of technologically inspired solutions. While largely concerned with the urban area, the EU also values economic and geographical cohesion through its initiatives.

On the other hand, they are similar in their historical development. In both polities, the overtly technology-driven characteristic of smart city conception at the early stage was toned down to embrace a citizen-centered perspective through adoption of the UN's SDGs. Both polities came to value citizen participation through community building in order to implement smart city projects in a locally tailored manner, at least on a discursive level. However, what connects the central governing discourse and the local implementation is the common structure of the policy process, which is a decentralized administrative structure of regional financial distribution. In both polities, regional cohesion is pledged in the legislated administrative procedures of the competitive allocation of financial resources.

The common structural characteristic in their policymaking points to the emergence of a similar set of structural challenges. Specifically, it may trigger the widening of the existing spatial inequality in the region. Recently, Japanese regional sociologists have called for more effort in critical research to elucidate the mechanisms under which the existing patterns of spatial inequality are reinforced via central regional policy. The decentralization reform in the 1990s made the regionally selective characteristics of the central government's regional investment more apparent and variegated (Tsukamoto 2012), justified with the neoliberal rhetoric of self-management based on competence (Sanada 2019). In this rhetoric, only competent municipalities in terms of the level and capacity of assimilation of the central governing discourses can win financial allocation. Consequently, the central financial allocation tends to concentrate in the already affluent urban center in the metropolitan area, regardless of its discursive promotion of regional vitalization. The consequence has been a gradual

institutional reorganization that leads to the further centralization of political power, and ultimately to spatially unequal development, concealed with the discourse of sustainable development and globalization (Nakazawa 2013). In the case of the EU, a similar urban locational trend was pointed out in the cohesion policy, regardless of its rhetoric of regionally balanced development (Grossi and Pianezzi 2017). This also points to the augmenting risk of gentrification at the urban center, as Shin (2016) demonstrated in the case of South Korea.

SPA 2018, EU-Japan Green Alliance 2021, and EU-Japan Digital Partnership provide Japan and the EU with an opportunity to accelerate their smart city engagement as political platforms for strengthening exchanges of experiences, know-how, and best practices. By sharing a common interest in securing a stable energy supply at an affordable price, investment in R&D in energy sector technologies may well increase. Future smart cities will offer a testbed for such technologies, furthering technical advancements while fostering regional development. At the same time, this article argues that they also share a structural risk of worsening the existing tendency of spatial injustice in an accelerated manner. To intervene in this structural consequence, public administrations must reconsider their tendency of representing local issues for attracting funding to carrying out technical experiments in smart city projects. For this goal, it is recommended that policy and decision makers seriously consider the characteristics of smart city initiatives in the EU and Japan as regional policies. This may lead to more responsible political interventions and effective financial allocation for the real achievement of economic and geographical cohesion. Finally, although still severely outnumbered, scientific efforts to elucidate the mechanisms through which societal issues of the past persist into actual smart cities are underway. This can assist the democratic responsibilities of public administrations to design smart city projects that bring real solutions to local issues.

Acknowledgements

Address:
Kie Sanada
      European Institute of Japanese Studies
      Stockholm School of Economics
      Saltmätargatan 19C
      SE 113 83 Stockholm, Sweden
E-mail: kie.sanada@hhs.se
Tel.: +46 8 736 9180

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