How are citizens involved in smart cities? Analysing citizen participation in Japanese ``Smart Communities''

2 authors:

Benoit Granier
Ecole normale supérieure de Lyon

14 PUBLICATIONS   **44** CITATIONS

Hiroko Kudo
Chuo University

15 PUBLICATIONS   **77** CITATIONS

Some of the authors of this publication are also working on these related projects:

Project   Japanese Smart Communities / Smart Cities View project

Project   Behaviour change in climate change and public health policies View project

How are citizens involved in smart cities? Analysing citizen participation in Japanese "Smart Communities"

Benoit Granier[a,*] and Hiroko Kudo[b]
[a]*Lyons Institute of East Asian Studies, University of Lyon, Lyon, France*
[b]*Faculty of Law, Chuo University, Tokyo, Japan*

Abstract. In recent years, "smart cities" have rapidly increased in discourses as well as in their real number, and raise various issues. While citizen engagement is a key element of most definitions of smart cities, information and communication technologies (ICTs) would also have great potential for facilitating public participation. However, scholars have highlighted that little research has focused on actual practices of citizen involvement in smart cities so far. In this respect, the authors analyse public participation in Japanese "Smart Communities", paying attention to both official discourses and actual practices. Smart Communities were selected in 2010 by the Japanese government which defines them as "smart city" projects and imposed criteria such as focus on energy issues, participation and lifestyle innovation. Drawing on analysis of official documents as well as on interviews with each of the four Smart Communities' stakeholders, the paper explains that very little input is expected from Japanese citizens. Instead, ICTs are used by municipalities and electric utilities to steer project participants and to change their behaviour. The objective of Smart Communities would not be to involve citizens in city governance, but rather to make them participate in the co-production of public services, mainly energy production and distribution.

Keywords: Smart city, smart community, participation, co-production, acceptance, Japan

1. Introduction

Together with the rise of "smartness", "smart cities" have rapidly increased in discourses as well as in their real numbers in recent years. Yet the concept of smart city varies a lot and its practices raise various issues. While many express optimism, others voice concerns about its manifold pitfalls. However, many of these discourses are based on simplified concepts rather than on actual smart city initiatives, or make over-generalisation from a few salient projects such as Songdo in South Korea or Masdar in the United Arab Emirates. Beyond these few flagships, there were about 150 smart city projects in 2014, mainly located in Europe, Asia and North America [11], that deserves careful analysis.

Some of these projects are located in Japan, which, like most other OECD countries, has been facing three main challenges related to environmental issues: reducing CO_2 emissions in order to mitigate climate change; ensuring its energy independence and security; and revitalising its economy by strengthening its competitiveness and becoming a leader in future "green" market. To deal with these issues, the

*Corresponding author: Benoit Granier, Junior Research Fellow, Lyons Institute of East Asian Studies, University of Lyon, Ecole Normale Supérieure de Lyon 15 Parvis René Descartes, BP 7000 69342 Lyon Cedex, France. Tel.: +33 437 37 6433; E-mail: benoit.granier@ens-lyon.fr.

Japanese government started its reflexions about "smart cities" and "Smart Communities" around 2007 and 2008. In 2010, the Ministry of Economy, Trade and Industry (METI) selected four "Smart Communities" – Keihanna Science City, Kitakyushu Smart Community, Toyota Smart Melit (Mobility & Energy Life in Toyota City), and Yokohama Smart City – within the "Demonstration of Next Generation Energy and Social Systems" programme [43]. Although only one of these is officially entitled "smart city", the New Energy Promotion Council (NEPC), a METI agency, defines these projects as "smart cities [which] are a new style of city providing sustainable growth and designed to encourage healthy economic activities that reduce the burden on the environment while improving QoL (Quality of Life)" [29]. It is noteworthy that, as will be underlined later, the academic literature draws a clear distinction between the concepts of "smart city" and "smart community". Thus, the authors distinguish the term "Smart Community" with capital letters referring to METI's projects, from the academic concept of smart community.

Japanese Smart Communities are mainly based on smart grid technologies, which aim at optimising energy management, integrating safely renewable energy and achieving peak shift through dynamic pricing or demand response. However, Smart Communities aspire to go further the mere smart grid, since although they focus on energy issues, another of their objectives is to make "smart" not only the grid, but also industry, commerce, business and householders' behaviours, including mobility issues. In this respect, METI's call for projects indicate two innovative features of Smart Communities, namely the "participation of all stakeholders among which the citizens", and behavioural change through "lifestyle innovation" [43]. It is worth noting that this focus on energy issues is not specific to Smart Communities: the very concept of smart city is imbued with this priority, especially in Japan [27,29].

While smart cities include a great number of objectives in various sectors, and raise manifold issues, for the purposes of this article the authors will focus on one salient point of tension that they also identify in Japanese smart cities, through the analysis of Smart Communities. This concerns the seemingly crucial and relentlessly claimed citizens' "engagement" or "participation" in smart cities and the relative weakness of both actual practices and research results related to this issue. Indeed, while scholars include this point as a key element of smart city definitions [9,14,42,57], they put forward that relatively little research has been done in this area so far [10,41].

Thus, our main research objective is first to analyse more in depth how citizens participate in Smart Communities, examining both the roles they are assigned and their actual practices. The "participation" quoted in the call for projects seems not to have been implemented on a large scale. Documents and interviews with the four Smart Communities stakeholders confirmed that significant participatory mechanisms were neither embedded into the master plan, nor organized since the beginning of the implementation. Therefore, this research also seeks to explain this gap between claimed and actual citizen participation.

Furthermore, a number of studies have highlighted potential social acceptance problems arising from energy infrastructure installation [38,68], and smart energy technologies' introduction [30,67]. While the former would simply need passive consent from the community, the later would require active acceptance from users [56]. However, both forms of acceptance would be strongly facilitated by the implementation of citizens' participation mechanisms [7,38], whether or not they actually take into account citizens' input [30]. Thus this paper analyses, first the expected and actual role of citizens in Japanese Smart Communities; second the issue of citizen participation as a policy instrument promoting acceptance rather than participation in policy and decision-making; third the model of smart city governance in Japan; fourth, how citizen involvement represents in this case a specific form of co-production. Smart Communities provide meaningful insights about how participation can actually takes shape.

The paper begins by exploring theories of participation to see how it has gained more and more importance in policy-making as well as policy implementation and how it has been transformed under New Public Management (NPM) and later with the introduction of New Public Governance. Since the paper considers the case of participation in Japan, research on Japanese participation is reviewed. As Smart Communities use information and communication technology (ICT), the potential impact of ICT on participation will also be investigated. The paper then explores the various definitions and characteristics of smart cities, before introducing Japanese Smart Communities and the research methodology. It then examines the questions through document analysis and interviews with the stakeholders of the projects. Although the authors conducted interviews within each of the four initiatives, the paper focuses on Kitakyushu's case as an illustration of Smart Communities' rationale. Indeed, Kitakyushu has the advantage of exhibiting the same participatory mechanisms but with a more pro-active approach than Toyota, Keihanna and Yokohama projects. While the other cases give very little additional insights about public participation in smart cities, Kitakyushu's case allows us for more substantial investigation and analysis.

2. Theories of participation

2.1. Public participation

Recent decades have been marked by an international trend towards increased citizen involvement in policy-making and growing interest in public participation issues from scholars [5]. Participation has been implemented in both local and national governments and in large array of areas [53]. Participatory mechanisms allow citizens to take part in the design, implementation, monitoring and evaluation of public policy. Since the landmark study conducted by Arnstein in 1969, many scholars have been tackling this issue and have elaborated classifications of public participation based on its purpose and degree [5,53]. For example, the representative typology proposed by the OECD draws a distinction between information, consultation and participation, in which the relationship between government and citizens is respectively one-way from the former to the latter, two-way with the latter simply invited to give their opinion, and two-way with citizens actively involved in the decision-making process and the management of the structure [15]. It is generally considered that participation may provide numerous benefits such as democratic and legitimacy gains, public policy and service quality improvement, social inclusion, social justice as well as contribution to the education and socialisation processes [5].

2.2. Co-production

In the framework of NPM, customer-oriented and outcome-oriented thinking have been introduced in policy-making and implementation [23]. Introduction and use of ICT to improve managerial processes and to enhance communication to and with citizens is a key factor for a successful e-Government policy. Subsequently, attentions on public service delivery and the role of citizens in its process led to New Public Governance. According to Bovaird, New Public Governance "seriously questions the relevance of the basic assumptions of NPM that service delivery can be separated from service design, since service users now play key roles in both service design and delivery" [6]. New Public Governance has adopted a citizen-centric approach and tries to guarantee participation of stakeholders [52].

However, participation in New Public Governance is usually stated as different from, or at least as a very specific version of, the notion in the traditional sense. The term "co-production" is endorsed by

scholars such as Bovaird who defines co-production as "the provision of services through regular, long-term relationships between professionalized service providers (in any sector) and service users or other members of the community, where all parties make substantial resource contributions" [6]. His paper's title advocates to go "Beyond Engagement and Participation" and the same rationale is apparent in other definitions such as the New Economics Foundation's one which states that "[co-production] is not about consultation or participation – except in the broadest sense. *The point is not to consult more, or involve people more in decisions*; it is to encourage them to use the human skills and experience they have to help deliver public or voluntary services" [50]. In other words, co-production differs from voice-based participation in the sense that it places the emphasis on cooperation through co-commissioning and co-delivery of services [7]. Under this framework, citizens are no longer considered as passive customers of public service since their experience and competences are fully recognized and mobilized [3,4]. Citizen influence varies from case to case; co-production does not systematically share decision-making power with users and is sometimes restricted to co-implementation [7,65].

2.3. Participation in Japan

Japan is inevitably depicted as a highly specific country with unique peculiarities [49]. While some scholars even raise doubts about the reality of democracy in Japan [8], others consider that although it obviously differs from western liberal democracies, Japanese democracy is effective but presents specific features due to its history and culture [2,19,69].

Yet, the peculiarities of Japanese democracy are of the utmost importance when it comes to analysing public participation. Indeed, some characteristics of Japanese society seem to be unsuited to the practice of public participation. For instance, Confucian values have shaped Japanese political tradition and remained to some extent even after the Second World War. Consequently, it is very often stated that Japanese people tend to prefer social order to individual freedom and an interventionist government to a small one; they are also seen as rather trustful towards government intentions and somewhat reluctant to protest publicly [19, p. 7]. While Nakane pointed out the strength of hierarchy in social relations and the tendency to decide by consensus [49, pp. 73–74], recent works assert that decision by consensus still holds a prevalent place [19, pp. 26–27] and that participation in Japan is little conflictual [69]. According to Nakane, when attending an assembly, very often Japanese people do not dare to openly express their opinion because of hierarchical power relations [49, p. 189]. Matsuura shows that even today these characteristics seem to impede public participation [39, p. 172].

However, other narratives consider that public participation in Japan is not much different than that in western countries [26,34]. Indeed, throughout the post-war era, not only have liberal democratic values unfolded in Japan; Confucian and other traditional values also have adjusted to these new values [19]. In the wake of the citizen and resident movements of the 1960s and 1970s, progressive local governments started to deal with social problems with citizen inputs, bringing a "change in the relationship between citizens and local administrations [that] signalled the development of participatory democracy" [32, p. 127].

Although individual citizens and citizen groups were rather passive and mostly reactive in their relation with government and towards policy-making until the 1990s, they became much more proactive starting from the late 1990s [19, pp. 127–129]. Furthermore, due to financial constraints, local governments must increasingly strengthen their cooperation with citizens for policy-making and implementation [32, p. 128]. Public participation is now institutionalised and widely practiced, and most participatory mechanisms present in western countries are effectively also frequently used in Japan [26,34].

This is particularly salient at the city level where *machizukuri* initiatives ("community-building") are flourishing, especially since the 1990s [58]. Public participation related to energy issues recently gained impetus, especially in the wake of the 2011 Fukushima nuclear disaster [66].

It is worth to return to the aforementioned distinction between participation and co-production. Indeed, assuming discursive and conflictual forms of participation do not come naturally to Japanese citizens; Japanese society's characteristics appear to fit co-production fairly well. That is, Japanese society benefits from strong social capital [58] and high civic engagement [19, p. 192]. Sorensen and others argue that although social capital in Japan is strong, it focuses on cooperation and assistance rather than on debate and initiative [58,69]. The relationship between state and society is also conceived as integrated and cooperative and is characterized by a high level of mutual trust [19, p. 113]. These statements resonate with some success criteria for co-production such as strong social capital and citizenship [61] and trust [6]. Moreover, Avenell pointed out that civic engagement in Japan progressively took the form of "symbiotic relationships with the state and the market" [2, p. 149]. Finally, service provision has also been ensured by neighbourhoods associations for decades, working in close collaboration with local governments [32,58]. In addition, these associations still disseminate information and directives from the local and central government at the neighbourhood level. This may explain the relative weakness of public participation and calls for carefully examining co-production forms of citizen involvement while analysing Japanese cases.

2.4. Criticisms of participation practices

Despite its numerous promises, public participation is also the subject of various criticisms about its relevance and its efficacy. The lack of willingness and competence of ordinary citizens to contribute to policy-making is often highlighted, especially when it comes to technical issues. Radical criticisms point out that participatory mechanisms aim at suppressing dissent and are tools of manipulation [12]. In this respect, participation is considered as policy instrument aiming at ensuring the acceptance of a measure or a project, without any ambition to consider citizens' input. Others lay the emphasis on its insufficient social inclusion and lack of representativeness [4]. The procedural and discursive dimension of public participation would exclude large sections of the population who do not have time or skills or do not feel comfortable in participating [5,37]. Therefore, enabling certain profiles of citizens to take part into policy-making at the expense of others would not be a progress but a deficit of democracy. Although co-production sometimes allows for better social inclusion [4] and mobilises people who usually distrust political parties [3], many barriers still need to be removed in order to achieve more effective and representative participation.

2.5. ICT potential for participation

Some scholars consider ICT to be a powerful means to promote and improve public participation [25, 46]. ICT may reduce participation costs by enabling citizens to participate through their mobile devices at any time and place [37]. The modes of expression and communication provided by ICT also allow new publics to have interest and legitimacy in participating in public affairs [46,48]. Not only would ICT widen the public of participation; it also has the potential to enrich the content of citizens' input that would no longer be solely in a discursive form [46]. Collaborative tools such as citizen sensing and other interactive applications [18] have the potential to enhance democratic debates, while information aggregators may facilitate citizen engagement [31].

E-participation, which mobilises ICT for participatory process, aims to increase citizens' abilities to participate in the political process [55]. This can go beyond by not only supplying citizens with information on public policies, but also giving them an opportunity to co-create them. Interactions between governments and citizens consist of provision of information, consultation and active participation of citizens on political decision-making [15]. ICT supports these interactions [1], and is believed to renew the trust in government [20]. In the electronic environment, citizens can interact with public officials in a more informal way and the nature of interactions would therefore become more horizontal and egalitarian, instead of vertical and bureaucratic [36].

Furthermore, it is worth noting that given the peculiarities of Japanese society, scholars argue that more than elsewhere, ICT could greatly boost citizen participation in Japan: for Ishikawa, "Internet is an ideal tool for jump-starting deliberative democracy in Japan" [25, p. 340]. Moreover, reflected by Sabouret who qualifies Japanese as "*homo technophilus*" [54], many scholars consider that Japanese people are keen to use new technology. However, the possibility of ICT to stimulate public participation is subject to criticisms. First, the promises of increased social inclusion may be counterbalanced by new forms of exclusion, regarding the elderly in particular [45]. This caution is especially relevant with regard to Japanese society since in 2014, 26% of the population is over 65 years of age. Second, although ICT allows for new forms of expression and creativity, it also favours individualised patterns of participation at the expense of collective patterns based on open discussion [35].

3. Smart cities' governance and citizen participation

3.1. Definitions and interpretations of smart cities

Although there is not yet any consensual and settled definition of the smart city, scholars have provided very insightful and valuable ones. Vanolo considers that the smart city is born out of the notions of "smart growth" and "intelligent city" [62]. In this respect, a smart city is a city which takes advantage of ICT in order to ensure its growth and attractiveness. More precisely, Giffinger et al. established six distinctive components, namely smart economy, smart mobility, smart governance, smart environment, smart living and smart people [14]. In a similar vein, and in order to clarify what they consider to be a "fuzzy concept", Caragliu et al. "believe a city to be smart when *investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance*" [9, p. 50]. Last but not least, Khansari et al. point out the reflexive dimension of smart cities, when noting that "the premise of a smart city is that by having the right information at the right time, citizens, service providers and city government alike will be able to make better decisions that result in increased quality of life for urban residents and the overall sustainability of the city" [33, p. 46].

The manifold objectives pursued by smart cities raise various points of tension, one being the immediately above-mentioned dual objective of seeking sustained economic growth and increased quality of life on the one hand and sustainability on the other hand. However, the point the authors would like to lay emphasis on concerns the seemingly crucial and relentlessly claimed citizen engagement in smart cities and the relative weakness of both actual practices and research in this area so far.

3.2. "Smart people" in "participatory" smart cities?

Both scholars and practitioners stress that (smart) citizens play a crucial role in smart cities, not only by their appropriate (smart) behaviour [33] but also by their participation in (smart) governance [14,41,42,57]. Furthermore, Caragliu et al. [9] highlight the need for participatory governance,

while Hollands [21] argues that smart cities request more than cutting-edge ICT and need contributions from various stakeholders among which the citizens.

However, despite the abundance of discourse about the key role of citizens in smart cities, relatively little research has been produced so far. As Chourabi et al. put it, "addressing the topic of people and communities as part of smart cities is critical, and traditionally has been neglected" [10]. Furthermore, they also consider that "most publications frame smart city governance as a technical or managerial issue" and note a "lack of attention for the politics of technical choices" since "both sustainability and citizen participation are not analysed as issues of political struggle and debate but rather as desirables for a 'good society'" [42]. Echoing these concerns, some scholars propose instead the notion of "smart community" since smart city would be "a city without politics where policies and digital services from the government are rolled out apparently without consultation and input from citizens let alone any form of democratic input or decision making" [14]. For Mellouli et al., "The concept of a smart community refers to the use of information and communication technologies by local governments and cities to better interact with their citizens, taking advantage of all available data to solve important problems" [42]. They add that "governments need not only to create new services to their citizens based on these technologies in order to improve their quality of life, but also to engage citizens in this new set of services" [42].

Given the diversity of smart city governance cases, it is worthwhile using the analytical framework proposed by Meijer [40]. Indeed, Meijer indicates two ideal-type models of smart city governance, connected to "two distinctive waves of technological innovation [...]: technologies for concentrated intelligence and technologies for distributed intelligence". In the former, new technologies (big data, etc.) would "enable central steering actors to strengthen their intelligence, provide more integrated services, develop better policies and steer other actors in the city more effectively". On the contrary, in the latter, new technologies such as social media and open data would facilitate cooperation between various actors and "takes direct citizen involvement as its starting point" [40]. What some authors term "smart community" [17,42] corresponds to smart cities whose governance resembles the latter ideal-type model. In this case, public participation is considered as an end in itself. By contrast, smart cities which mainly aim at improving public services provision and quality of life correspond to the former, in which public participation is more akin to a means. However, these are ideal-type models and actual smart city projects are obviously imbued with both rationalities, although with a different balance.

3.3. Participation in energy management in smart cities

Many smart cities intend to tackle environmental and energy challenges in introducing smart infrastructure, especially smart grids [17,57]. As mentioned in the introduction, energy projects often generate lively debate and face social acceptance problems [38,68]. Concerning smart grids, research has shown that mechanisms of public participation can be effective instruments to gain consent from citizens [67] although they may be used primarily for neutralising dissent [30]. Especially, co-production patterns of participation would favour citizens' acceptance of constraints or even punishments [7]. However, the introduction of smart energy technologies needs more than passive acceptance and require active acceptance from users [56].

Indeed, smart grids do not only promote the use of renewable energy and help to optimise energy management: they also allow for decentralized ways of production and invite citizens to take part in energy management, and to become "co-managers" [59], "co-providers" [13,63]; in other words, co-producers. While citizen engagement at the early stage would favour their active participation in energy management [22], many projects hardly intend to involve users and miss out on various benefits [64]. In a nutshell, depending on the projects, individuals can be considered as citizens, as mere consumers or even as obstacles [64].

Fig. 1. "Next-Generation Energy and Social Systems Demonstration Areas". (Colours are visible in the online version of the article; http://dx.doi.org/10.3233/IP-150367)

4. Participation in Smart Communities

4.1. *Japanese smart cities/communities and Smart Communities*

As analysed earlier, the expression "smart community" is used to underscore the importance of community and citizens' participation [17,42]. This focus is also found in the Japanese concept of "smart community" (*sumâto komyuniti*), which is popular at least since the early 2000s [24]. Furthermore, while notions such as "sustainable city" and "smart community" were closely tied together in the 2000s [60], in the 2010s the terms "smart city" and "smart community" have become prevalent. They usually designate similar objects, and the METI agency, NEPC, explicitly considers them as synonyms [29].

This being said, the first series of projects related to "smart city" started in 2010 with the designation of four Smart Communities within the "Demonstration of Next-Generation Energy and Social Systems" programme. This plan promotes the development of smart grid solutions, which are set as goals in the government's growth strategy, [43]. Yokohama City, Toyota City, Keihanna Science City, and Kitakyushu City, in partnership with energy, IT and electronics companies, were selected as experiment areas by METI (see Fig. 1). The focus on energy echoes the perspective of Japanese companies and projects such as Kashiwa-no-ha Smart City.

However, Japanese smart cities, Smart Communities included, are not limited to grid issues insofar as they aim at managing a broad range of socio-economic life elements (climate change mitigation, transportation, lifestyle change, etc.). In addition, it is noteworthy that having complied with requirements of METI, each project is free to develop specific features that are not limited to METI's. Especially, in the aftermath of the East Japan Earthquake of March 2011 and the subsequent nuclear power plant accident,

their characteristics started to diversify: the demand for resilience was strengthened and embedded into most Japanese smart city projects. While ICT is considered has a key element to tackle the issue, the challenge of changing lifestyles is also presented as a priority. Furthermore, citizen participation was considered especially important, since a Smart Community requires the involvement of households to enable two way energy flows [44].

4.2. Methodology

This research is based on qualitative analysis and uses the following analytical tools: desk research on primary documents, semi-directive interviews and field observation.

We first examined documents of METI and Smart Community cases, including their Master Plans as well as press release and communication materials. Most of these documents were obtained from the METI and local governments' websites, covering the period from April 2010 to December 2014. Other related documents were received directly from the institutions during the field survey. This first step aimed to understand the extent of public participation, and to identify the nature of its mechanisms.

Second, we conducted semi-directive interviews with METI, the local governments and private actors involved in each project, as well as with Smart Communities' inhabitants, from February to July 2014. In total, thirty-four interviews were carried out with the main stakeholders (one with METI, nine in Kyoto Keihanna, eleven in Kitakyushu, ten in Yokohama and three in Toyota). The interviews were not taped in order to establish a climate of confidence; however all interviews were transcribed. In the case of Kitakyushu, we interviewed two dozen of residents. Our sample, mainly composed of housewives and retired persons, is not representative of Smart Communities' households, but it fits fairly the sociology of people usually involved in public participation in Japan [32].

Third, in the case of Kitakyushu, we also carried out a field observation. We attended to one of the regularly scheduled meetings of all stakeholders, including a representative of the citizens, and participated in the Higashida Share Festival, held on 17–18 May, 2014, during which we could talk with the residents on an informal basis and gauge their relationship with the other stakeholders.

As mentioned in introduction, we decided to focus on Kitakyushu's case because the document analysis and the first interviews we conducted in the other cases, especially Toyota and Keihanna, revealed weak ambitions in terms of public participation, although in a similar perspective as Kitakyushu's; and because it was not possible to conduct interviews with the residents in Yokohama.

4.3. Case analysis: Kitakyushu Smart Community

Kitakyushu City is located in an historical industry area and has about 970 thousands inhabitants, covering a land area of 500 square kilometres. It has hosted since 1901 the first Japanese steel works (public Yawata Steel Works, which later became Nippon Steel), on which the development of the city as a centre of heavy and chemical industry relied. In the 1960s, the region faced air pollution and contamination of the waters of the bay. After overcoming these issues, the city launched eco-related industries and became one of the first to host landfill sites as well as factories for the recycling of consumer electronics in Japan. The region, thus, converted from heavy industry based economy into green one.

These characteristics are reflected in the project proposed by Kitakyushu City Government, Nippon Steel, IBM Japan, and Fuji Electric Systems. Its objectives are summarised as: 1) creating a regional energy management in which citizens and all other community members participate; 2) disseminating the results across the city by incorporating it in the city's community development policy; and 3) achieving an additional 10% reduction to the planned CO_2 emissions cut. Thus the plan includes: 1) development

Table 1
List of interviews, meeting and observation

Organization and status of interviewees	Interview date	Reference in the text
Interview (informal) with a Kitakyushu city official attending the stakeholders meeting	May 16, 2014	[I1]
Interview with Satoyama-o-kangaeru-kai representative	May 16, 2014	[I2]
Interview with two researchers from Toppan Printing Co., Ltd	May 29, 2014	[I3]
Interview with Kitakyushu city officials, including the Manager of the Office for Environmental Future City Promotion	June 19, 2014	[I4]
Interviews with two dozen of citizens participating in Kitakyushu Smart Community Project	May 16–18, 2014	[I5]
Stakeholders' meeting gathering Satoyama representative, six Kitakyushu city officials, three researchers from Waseda University Academic Solutions Corporation, and the General Manager of the main company of the consortium, Nippon Steel	May 16, 2014	[I6]
Observation field: Higashida Share Festival	May 17–18, 2014	[I7]
Stakeholders' meeting gathering Satoyama representative, six Kitakyushu city officials, three researchers from Waseda University Academic Solutions Corporation, and the General Manager of the main company of the consortium, Nippon Steel	May 16, 2014	[M1]
Observation field: Higashida Share Festival	May 17–18, 2014	[O1]

of new energy; 2) deployment of energy conservation systems; 3) regional energy management; and 4) development of communities and transport systems based on energy infrastructure.

The city has developed a district on unused land in the Higashida area of Yahata-Higashi ward, the site of the operational experiments and of the Yawata Steel Works, which already emits 30% less CO_2 than other areas in the city. In the district, the municipality has established new energy infrastructure, among which the supply of energy produced by natural gas and the supply of hydrogen produced by the steelworks' utilities. In order to optimise community energy management, the project seeks to create appropriate social structures by innovating in lifestyles and business styles. By means of the operation of a customer energy management system called Smart Community Centre, the project aims to establish mechanisms for citizens and companies to participate in the energy management. To this end, Energy Management Systems have been established for homes (HEMS) and buildings (BEMS). It is believed that making energy use visible would encourage change in lifestyles and business. Other initiatives include introduction of next-generation vehicles and their linkage with public transport.

It is clear that the city had concentrated its attention on energy, not necessarily on ICT driven services. This is, however, not the peculiarity of the case: it can be observed in other projects as well.

4.4. Participation and involvement in Kitakyushu Smart Community

The authors interviewed officers of the Municipality of Kitakyushu City (Office of Environmental Future City Promotion, Environmental Bureau) [I1, I6], Kitakyushu Smart Community Creation Project Secretariat (hosted by the municipality) [I1], *Satoyama-o-kangaeru-kai* (a Non-Profit Organisation, which participates in governance, conducts meetings with households and organises tours for visitors) [I4], two researchers of Waseda University Academic Solutions Corporation, in charge of providing software for citizen involvement [I2], Toppan Printing Co., Ltd., which analysed the behaviour change of the residents in terms of energy saving [I5], and two dozens of citizens [I7], mainly focusing
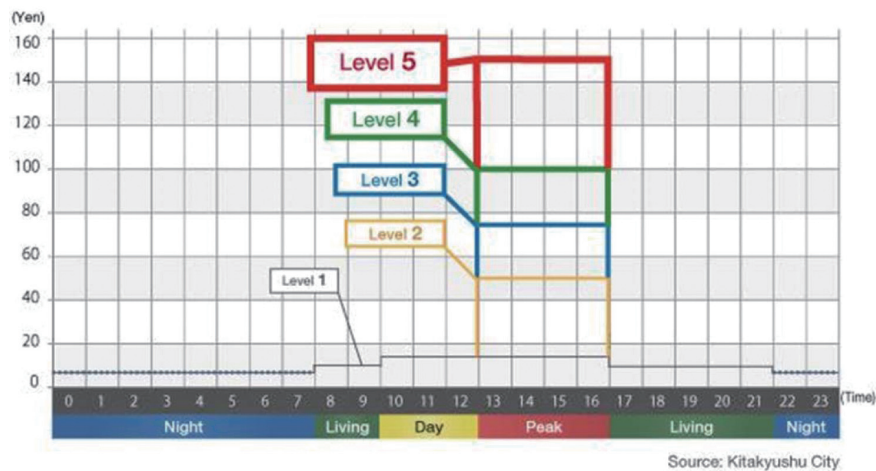
Fig. 2. Mechanism of Dynamic Pricing. (Source: Japan Smart City Portal, http://jscp.nepc.or.jp/article/jscpen/20120920/ 323744/print.shtml)

on the citizen participation in planning as well as delivery process of the project. As mentioned earlier, the authors attended to the Higashida Share Festival [O1] and to a stakeholders' meeting [M1], followed by an informal discussion with a municipality official from an adjacent division [I3].

The private companies involved had collaborated with the municipality from a very early stage, prior to the call of METI. They created a project secretariat within the municipality, dispatching their staff to it, and consider that in this way, they were able to gain trust from the residents in the planned area [I1, I6]. This understanding is confirmed by most of the citizens we interviewed [I7] and by *Satoyama-o-kangaeru-kai* as well [I4]. Drawing from documents and interviews, there is no doubt that major industrial actors have been "the authority" together with the municipality.

Citizen participation is guaranteed in two processes; one is residents briefing before the project initiation and the other is feedback meetings during the implementation [I1, I4, I6]. During the first, consensus building, especially for privacy issues, was achieved. Since some experiments, including dynamic pricing, an economic incentive/disincentive system which tries to change energy consumption behaviour of the households (see Fig. 2), required data gathering of households, consent of the residents was needed. Most of the residents participated actively in the experimentation, although there was no direct "participation" during the project designing. This sounds somewhat paradoxical; indeed, most residents agreed to participate in the project and gave consent for gathering and using their energy consumption data by the consortium, without strong concern and/or specific request to the project [I1, I4, I6]. According to city officials and *Satoyama-o-kangaeru-kai* representative, most citizens participated in the project simply because they were asked by the municipality [I4, I6], and this was confirmed by the authors' interviews with the households [I7]. In addition, the studies provided by and discussed with researchers from Waseda University Academic Solutions and Toppan Printing highlight the "contribution to society" as their main motivating factor [I2, I5].

During the feedback meetings, the project team gathered information, opinions, and suggestions from the residents. In these meetings, residents were asked to answer a questionnaire and express their opinions. Besides some suggestions regarding the tariff differences, few opinions were expressed [I1, I4, I7]. This is not an isolated case in Japan; it is rather common that these meetings generate little reactions [39].

The interviews provided several interesting indications. First, Kitakyushu city officials said that what they expect from the citizens is to "cooperate" [I6]. Similarly, various representatives from the involved

companies considered that citizens are not competent in ICT and energy issues, and have consequently no legitimacy to take active part in the governance of the project [I1]. In this regard, it is worth noting that the representative of the citizens, who participates in the stakeholders meetings, works in one of the companies of the consortium [M1]. Therefore, while *Satoyama-o-kangaeru-kai*'s representative deplores the lack of citizens' interest in the development of the Smart Community [I4], the least one can say is that, from the outset, the project team did not favour public participation. According to the critical opinion of a municipality official, citizen involvement would be, above all, a means to foster social acceptance and behaviour change [I3]. This statement echoes the fact that changing the energy consumption patterns of citizens seems to be the main objective of the project team. Since the households get information about the details of their energy consumption, they are expected to rationalise their consumption, especially to "save" energy in peak times with higher price level. In this respect, in Kitakyushu and in Japanese Smart Communities in general, citizens are not expected to take part in the project governance.

Therefore, it appears that the Japanese concept of "smart community", which the authors analysed through Smart Communities, does not correspond to what the major academic literature defines as a smart community [17,42]. Instead, Japanese projects conform better with the concentrated intelligence type of smart city governance, in which citizen input is not expected beyond a very specific and limited set of expression and actions [40].

5. Findings and future research

Analysis of policy, related materials and interviews on site revealed some general features of Japanese Smart Communities as well as features related to the main research question that is participation in smart cities.

First, the current Smart Community projects are still in a stage where it is too early to understand the true intention of the government as well as the municipalities. However, from the materials of METI, it is rather clear that the original policy of Smart Community is intended as an economic stimulus, considering that the investment related to the projects might boost industrial activities in the regions. The fact that the private companies in the regions, and major energy, telecommunication and ICT companies are involved from the very early stage, means that the Ministry was mostly keen on the creation of new industry. This process has been typical of the Ministry; it is well known that the high-tech industry has benefited most from these policies [51]. Furthermore, the major part of the current projects related to energy management, especially on energy saving, peak shift and creation of new energy sources. Building energy management system is part of this energy saving strategy and was sought to reduce energy consumption, or at least to rationalise it.

In terms of participation, interviews with each projects' stakeholders clearly revealed that citizen participation as defined at the beginning of the article and as often expected for smart cities' development [9,14,42,57] is an objective of Smart Communities. The hypothesis that participatory mechanisms would have been implemented in order to suppress dissent and to manipulate the public, underlined by some researchers [12,47], is supported by one of the municipality officials [I3]. However, interviews with the other stakeholders, including the NPO *Satoyama-o-kangaeru-kai*, as well as with the citizens, invite to dismiss this hypothesis. Indeed, there was actually no opposition from the households, even from the very beginning of the project. Furthermore, the strategy held by the municipality and the private companies in order to enrol the participants was based on clear and transparent explanations about the way dynamic pricing would be implemented, and personal data collected and used. Thus, rather, the authors assume that the gap between claimed and actual participations can be explained by other

reasons. Indeed, Smart Communities represent highly concentrated intelligence-type of smart city governance in which new technologies "enable central steering actors to (. . .) steer other actors in the city more effectively" [40].

Thus, Smart Communities' governance neither "takes direct citizen involvement as its starting point" [40] nor expects significant inputs from people. Instead, citizens are required to consent to be steered in a way that makes the city smarter. However, since Smart Communities, like Japanese smart cities in general, mainly focus on smart grids, citizens' acceptance cannot be simply passive [71]. For a city to be smart from the perspective of energy management, active acceptance of citizens is needed [56]. In Kitakyushu case as in other Smart Communities, public and private stakeholders urged citizens to become "prosumers" [I1, I2, I4, I5, I6, M1], that is to co-produce energy production and distribution services. In this respect, ICTs are not used to improve participation in deliberative and decision-making processes, but to facilitate the co-production of energy services, although in its restrained meaning of co-implementation. Smart citizenship would subsequently consist of being (co-)producer and consumer of services.

Since obtaining an active acceptance of smart energy technologies is not an easy task [30], Kitakyushu's stakeholders were very insistent with citizens. They organized a lot of meetings, even sometimes going door-to-door and strongly emphasising the "community" as it has been identified as a critical factor of citizen engagement, especially in Japan [38]. And this worked: not only did citizens allow the electric utility to access and use their private data of consumption, but they also accepted the installation of micro-generation units which are connected to the grid and remotely controlled by the utility. They also completed questionnaires and some of them took part in meetings in order to share their experience and problems, and subsequently helped to improve the utilities' services and management. Last but not least, citizens also significantly shifted their energy consumption from peak to off-peak period when they were asked to, in accordance with Khansari et al.'s statement that smart cities' reflexivity implies that citizens change behaviour according to real-time feedback [33].

This pattern of participation can be explained by the focus of Japanese smart cities on energy issues, and by Japanese society's traditional characteristics that seem to be favourable to co-production of public services (see Section 2.3). However, since the experimentation only started in 2012, it is still unclear whether these practices will be maintained in the long term. Furthermore, the limitation of the area (120ha), the number of residents involved (900) and the peculiarity of Kitakyushu city do not enable to contend that citizens would be that much cooperative in other contexts. Nevertheless, although this article does not aim at providing generalisable conclusions about participation in smart cities, the fact that citizen involvement shows similar characteristics in other Smart Communities as well support the idea that Kitakyushu's case is far for being unique. Accordingly, other smart city projects may draw lessons from Kitakyushu Smart Community. Especially, it underlines the importance of the trust factor, which is precisely one of the new key elements under post-NPM, for the participation of citizens to the energy management co-production.

Furthermore, another ambition of this article is to highlight that it is better to be cautious with "citizen participation" claims when it comes to smart cities. Although we admit that Japanese society differs from Western ones, the smart grid technologies Smart Communities rely on are at the core of smart city projects throughout the world. Therefore, the fact that smart cities may mobilise ICT to steer citizens rather than to catalyse public participation calls for further research. Indeed, the Japanese case suggests an interlocking between the rise of smartness and the emergence of a "behaviour change agenda" [16,28] based on the use of behavioural sciences and big data. In this regard, citizen involvement in smart cities may be considered as a disciplinary strategy [62] and seen as a means rather than as an end in itself; in

other words, as a policy instruments aiming at improving efficiency rather than deepening democracy. Although already underlined by the literature [7], the ambiguous relation between co-production and governmental approaches to behaviour change would deserve further analysis when ICT is at stake.

Acknowledgements

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