More on Japan's Energy Technocrats and their Smart Communities[1]

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December 1 saw renewable energy burst through a stubborn bottleneck of vested interests and outmoded ideas. Germany's biggest utility, E. ON, announced it would hive off fossil fuel and nuclear, leaving them to some as yet unnamed entity, and focus on "a new business model based on renewables, intelligent grid systems, energy management and other services."[2]

E. ON's startling decision will certainly influence Japanese debate and policymaking on power reform and smart communities, as Japanese mainstream energy technocrats have been diligently examining Germany's power policies for years. Their attention predates Japan's March 11, 2011 (3-11) natural and nuclear disasters. And even prior to E. ON's startling declaration, they had deemed the feed-in tariff (FIT), distributed generation, and other key elements of the *Energiewende* ("energy shift") useful. The institutions through which Japan's energy technocrats are adapting Germany's lessons to Japanese circumstances are potentially very powerful. They may be rebooting some of the mechanisms that were key to Japan's startling postwar recovery. This paper reviews the emerging evidence and then returns to consider its possible implications.

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1 This article expands on Andrew DeWit, "Japan's Radical Energy Technocrats: Structural Reform Through Smart Communities, the Feed-in Tariff and Japanese-Style "Stadtwerke," The Asia-Pacific Journal, Vol. 12, Issue 47, No. 2, December 1, 2014: http://japanfocus.org/-Andrew-DeWit/4229

2 Paul Hockenos, German Fossil Fuel Giant Jumps on Renewables Bandwagon," Renewable Energy World, December 3, 2014: http://www.renewableenergyworld.com/rea/news/article/2014/12/german-fossil-fuel-giant-jumps-on-renewables-bandwagon

E. ON Goes Green: http://www.cnbc.com/id/102225999#.

Learning the Stadtwerke Business from Germany

Japan's smart-energy technocrats – an expanding stream of intellectuals and bureaucrats – are implementing a structural reform for rolling out smart communities. The smart community paradigm is centred on distributed power, but also encompasses other utility services (eg, water and district heating), mobility, communications, governance, health care, and the other elements of modern urban life. The most recent summary statement of the Japanese project is outline (in Japanese) in *Smart Communities: A Smart Network Design for Local Government Infrastructure*. This important new book was organized by Japan's top mainstream energy intellectual Kashiwagi Takao and published October 15, 2014.[3] The book's initial chapter is written by Kashiwagi, and describes how Japan's energy technocrats are using the FIT, *stadtwerke* (municipal business), power-sector deregulation and other key elements of Germany's green energy transition as engines for something much more

[3] See Kashiwagi Takao (ed), *Smart Communities: A Smart Network Design for Local Government Infrastructure* (Tokyo: Jihyosha): http://www.jihyo.co.jp/smart_community4.html

ambitious. The Japanese are linking the project to fiscal and financial policy, with the potential to revitalize industry, build resilience, and bolster local democracy.

Kashiwagi Takao: http://next.rikunabi.com/tech/docs/ct_s03600.jsp?p=001880

Kashiwagi's chapter depicts smart communities as the key item in Japan's growth strategy. Kashiwagi has been making the argument for well over a year, in previous books as well as numerous articles and smart-community events. It is important to stress that Kashiwagi is not some mere academic scribbler, awaiting a daring policy entrepreneur to put his ideas into action. Rather, he is himself an enormously influential figure in Japanese energy policymaking circles. In addition to his academic role as specially appointed professor at Tokyo Institute of Technology, Kashiwagi is also chair of Japan's Hydrogen/Fuel Cell Strategy Council,[4] chair of the Ministry of Economy Trade and Industry's (METI) new energy subcommittee of its Committee for Natural Resources and Energy, Project Leader of Tokyo Institute of Technology's Advanced Energy Systems for

[4] On this, see Kenji Kaneko, "Japan Announces Roadmap for Hydrogen Introduction," Nikkei BP CleanTech Institute, July 3, 2014: http://techon.nikkeibp.co.jp/english/NEWS_EN/20140703/362860/?ST=msbe

Sustainability,[5] to name a few of his positions of influence in policymaking. Through these positions, Kashiwagi appears to have helped realize Japan's June 14, 2013 New Growth Strategy's explicit commitment to ICT-led growth. He also certainly had a hand in coordinating the expansion of smart-community projects and the increasing streams of finance flowing from the various ministries of the central government plus their allied quangos (Quasi Autonomous Non-Governmental Organization) such as the New Energy and Industrial Technology Development Organization (NEDO).

Kashiwagi's vision, as articulated in his book chapter, puts the motive force for rolling out Japan's smart communities in a vehicle akin to the German *stadtwerke* of municipally owned utilities. Germany's 900 or so *stadtwerke* that operate in energy - out of a total of 1420 that operate in water supply, sewage, waste management and other community functions[6] - were among the major winners from German power deregulation. They are also increasingly recognized as key to that country's ability to diffuse renewable energy, whose role in Germany's power mix has risen from about 6% in 2000 to 30% in 2014. The stadtwerke have helped drive this impressive progress because they have organizational, financial and other heft together with a central role in servicing community demand for power.[7]

The German stadtwerke's role appears set to increase further in quantitative as well as qualitative terms. For example, influenced by an "energy avant-garde," Dessauer Stadtwerke in Saxony-Anhalt is poised to replace its ageing coal-fired

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[5] Kashiwagi's leadership message is available on-line in English: http://aes.ssr.titech.ac.jp/english/en-greeting

[6] On this, see p. 5 Caroline Julian, "Creating Local Energy Economies: Lessons from Germany," ResPublica, July 2014: http://www.respublica.org.uk/Images/Creating%20Local%20Energy%20Economies%20-%20Lessons%20from%20Germany.pdf

[7] See Paul Hockenos, "Local, Decentralized, Innovative: Why Germany's Municipal Utilities are Right for the Energiewende," Energy Transition, September 28, 2013: http://energytransition.de/2013/09/local-decentralized-innovative-why-germanys-municipal-utilities-are-right-for-the-energiewende/

generation fleet with decentralized and renewable power, together with an innovative thermal-storage system.[8]

Old Dessau Mine Now a Festival Site For Digging Rock (Music) Rather than Coal:
http://www.dw.de/the-energy-avant-garde-when-coal-mining-goes-green/a-18105345

At the same time, E. ON's immensity portends yet another threat that big capital might dominate and define the transition as well as monopolize its considerable opportunities. As one observer warns, "the determined entry of such a big player into the market will likely happen at the cost of Germany's decentralized, small-scale producers - the backbone of the *Energiewende* ["energy shift"] until now."[9] It is unclear at this point whether E. ON's aggressive move into

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[8] Jutta Schwengsbier, The energy avant-garde: when coal mining goes green," DW, December 4, 2014: http://www.dw.de/the-energy-avant-garde-when-coal-mining-goes-green/a-18105345

[9] Paul Hockenos, German Fossil Fuel Giant Jumps on Renewables Bandwagon," Renewable Energy World, December 3, 2014: http://www.renewableenergyworld.com/rea/news/article/2014/12/german-fos

renewable energy, smart grids and other elements of the new paradigm will weaken the expanding role of the German stadtwerke in the energy shift. The latter are generally popular with residents and are linked to the powerful community movements that have succeeded in renationalizing (or, more accurately "re-municipalizing") the power grids of such urban centres as Hamburg.[10] These grids and other assets, such as gas and district heating networks, are largely held by the big 4 energy giants, E. ON, RWE, EnBW and Vattenfall that dominate Germany. It remains to be seen how far remunicipalization reaches, but in some German communities the project aims at bringing not just power but also gas and district heating into community ownership.[11]

Stadtwerke and Japan's Local Public Corporations

Japan's own history of local public corporations also offers a fertile basis for the insertion of energy-centred stadtwerke. Japan's 1700-plus local governments have long had their utility functions, especially water, serviced by local public corporations that total just under 9000 at present. Postwar Japan has seen waves of expansion of local public corporations' roles and numbers, as the need arose. Their ranks swelled rapidly in the years of high growth (the mid 1950s to the min-1970s), due to the imperative of diffusing such basic infrastructures as waterworks and sewerage in cities and towns undergoing what was then an unprecedented pace of urbanization. Later on, the public corporations' welfarist

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sil-fuel-giant-jumps-on-renewables-bandwagon

[10] See Charleen Fei and Ian Rinehart, "The Re-Municipalization of the Hamburg Grid," Energy Transition, June 27, 2014: http://energytransition.de/2014/06/remunicipalization-of-hamburg-grid/

[11] On this ambitious goal, see Claire Provost and Matt Kennard, "MSP Co-Director interviewed on remunicipalisation trend," Municipal Services Project, November 12, 2014: http://www.municipalservicesproject.org/event/msp-co-director-interviewed-remunicipalisation-trend

role grew between 1975-1984, and for industrial promotion between 1985 and 1995.[12]

During those decades, the total number of Japan's local governments sharply declined. Amalgamations between 1953 and 1955 saw their count more than halved from 10,520 in October of 1945 to 3,975 in September of 1956. They continued to merge afterwards, reaching 3,229 in 2000, and then dropped to 1,718 in April of 2014.[13] That decline in the number of local governments, even as the number of local public corporations increased, underscores the significance of the latters' role.

As of fiscal year 2012 (FY 2012), Japan's 1,718 local governments boast a total of 8,843 public corporations, of which 3,637 (41.1%) manage the sewer systems and 2,152 (24.3%) the water supply. These businesses total (FY 2012) YEN 17.6 trillion in operations, and are managed through special accounts that are separate from Japan's local government general-budget (whose spending on sanitation, education, public works, and other categories is just under YEN 95 trillion). Of the public corporations' YEN 17.6 trillion in operations, the sewerage-works represent YEN 5.8 trillion (33%) and the water-works YEN 4.4 trillion. Local public corporations also operate in the black, earning a total of YEN 4.6 trillion (FY 2012), of which sewerages earn YEN 1.2 trillion and waterworks YEN 2.2 trillion.[14] These are, in short, significant local public service business

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[12] See p. 139 Masaru Sakamoto, "Public Corporations in Japan, with Special Emphasis on Personnel Management," in All Farazmand (ed) Public Enterprise Management: International Case Studies. Greenwood Press, 1996.

[13] See (in Japanese) "The Particulars of Meiji and Showa-era Amalgamations and Changes in the Number of Local Governments," Ministry of Internal Affairs and Communications, (nd): http://www.soumu.go.jp/gapei/gapei2.html

[14] The details on Japan's local public corporations are available (in Japanese) at the Ministry of Internal Affairs and Communications White Paper on Local Finance, 2014: http://www.soumu.go.jp/iken/zaisei/24data/2012data/24020802.html

operations that contribute to the economic activity of the local area as well as to the revenue base of the local governments.

One of the few Japanese local public corporations in power, Shimane Prefecture's Gotsutakanoyama Wind Farm: http://www.pref.shimane.lg.jp/environment/energy/energy/denki_jigyo/fuuryoku/takano_f.html

Unlike their counterparts in Germany, Japan's local public corporations have almost no presence in electricity and gas. Japan's public corporations' businesses represent only 0.9% of the country's power supply and 2.6% of its gas supply businesses. In Kashiwagi's conception, these areas of business are key infrastructures for growing the smart community as well as diffusing economic opportunity to nearby communities that could supply larger communities with power and energy. In this respect, Kashiwagi suggests that Japan's local governments stand to gain at least YEN 5 trillion of Japan's YEN 15 trillion power economy through distributed renewable energy supported by the FIT. That would be a huge boost for their finances as well as the resilience of their local economies.

The Disruptive Possibilities of Local Power

Postwar Japanese prefectures, cities and towns have been passive consumers of centralized privately-owned power delivered by 10 monopoly firms that also

dominated their respective catchment areas' political economies. Going distributed, and fast, through smart public agency, is the surest way to disrupt the old business model of the power utilities. The E. ON example is just the latest evidence of how vulnerable old-line utilities are to distributed and renewable energy. Japan's private utilities know this, which is why they are desperate to water-down the power-sector deregulation slated for 2016 as well as place their people in charge of the Organization for Cross-regional Coordination of Transmission Operators (OCCTO), the new agency to police the grid.[15]

When viewed against this background, the energy technocrats' initiatives appear to have an unstated but potentially quite "political" dimension. The power stadtwerke in Japan offer a mechanism that puts the incentives to champion revolutionary change, leading smart communities, into the hands of the cities and towns. The Ministry of Internal Affairs and Communications (MIC), a fortuitous blend of ICT enthusiasm coupled with responsibility for local fiscal health, has in fact set a goal of establishing no fewer than 1000 local energy firms over the five years from 2015. The national government will not only allow local governments to finance investments in these firms, but it will pick up half the interest payments.[16] Moreover, Kashiwagi will help coordinate these initiatives as chair of a new MIC "Commission for Deploying a Local-Government-Led Community Energy System." This Commission was created by MIC on November 4 of this year, and held its first meeting on November 7. It will have 3 more meetings, seeking to devise a template for local-government decentralized energy systems, prior to the end of its tenure in

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[15] On the institutional details, not the politics, see Peter Weigand and Sumitaka Matsumoto, " Japan's New Electricity Market," Electric Light and Power, July 16, 2014: http://www.elp.com/articles/powergrid_international/print/volume-19/issue-7/features/japan-s-new-electricity-market.html

[16] On this, see "Small-town Japan's big hopes for energy self-sufficiency," Nikkei Asian Review, October 28, 2014: http://asia.nikkei.com/Politics-Economy/Policy-Politics/Small-town-Japan-s-big-hopes-for-energy-self-sufficiency

March of 2015.[17] These and other moves suggest smart-energy bureaucrats in the MIC are acting quickly, using the Abe regime's desperation to ignite sustainable domestic growth via a focus on "local Abenomics" and "regional revitalization" since mid-2014.[18]

The number of smart-community participants is increasing as well, opening up yet more room for local leadership, innovation, and engagement of universities as well as NGOs and other citizen groups. For example, the Tokyo Metropolitan Government and its 62 area local governments (wards, cities, and towns) are organized as EcoNet Tokyo 62. The EcoNet Tokyo 62 "Commission on Renewable Energy and Smart Communities" has been at work since 2012, developing a "smart community handbook" of best-practice for local communities that are yet to initiate projects.[19] This commission is not a passive vehicle for distributing corporate PR. One of the three key members of the committee, Morotomi Tooru, Professor of Economics at Kyoto University, is a specialist on Germany. He is also head of the "Ider Project" at Kyoto University, which has been undertaking extensive research on the German model as a means of diffusing renewables, not just by the FIT but also by the stadtwerke as an institution.[20] Added to this leadership, the Kanto and other regional divisions of METI are also working on organizing their area local governments, so as to accelerate the diffusion of smart communities centred on energy.[21]

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[17] See (in Japanese) "Opening of a Commission for Deploying a Local-Government-Led Community Energy System," Japanese Ministry of Internal Affairs and Communications (MIC), November 4, 2014: http://www.soumu.go.jp/menu_news/s-news/01gyosei05_02000053.html

[18] For a summary of the politics of "local Abenomics," see Linda Sieg and Tetsushi Kajimoto, "Japan's 'Abenomics' feared in trouble as challenges build," Reuters, September 2, 2014: http://www.reuters.com/article/2014/09/02/us-japan-economy-abenomics-idUSKBN0GX0VY20140902

[19] See the website (in Japanese) for the EcoNet Tokyo 62 "Renewable Energy and Smart Community Research Commission," which is to produce the handbook: http://all62.jp/saisei/index.html

[20] The Ider Project page and its numerous research reports (in Japanese) is here: http://ider-project.jp

[21] See, in Japanese, the Kanto Meti's page on its "sumakomi" (smart

Nippon Steel and Sumitomo Metal Group's Kitakyushu Smart Community: http://www.nssmc.com/en/product/use/resource/smart/

Japan has at least 100 smart city (aka "smart community," "smart town,") projects underway. At the end of the current fiscal year (March 31, 2014), the flagship projects in Kitakyushu, Yokohama, Keihanna (Kyoto) and Toyota graduate from their 4-year subsidy support, to emerge as full-fledged self-sustaining projects. These appear to be too strongly led by large corporate concerns, as the EU-Japan Centre for Industrial Cooperation's Clarisse Pham highlights in her detailed October 2014 analysis "Smart Cities in Japan."[22] Surely Kashiwagi and his cohort are well aware of those facts, and what they imply for the viability of Japan's smart communities in the global marketplace.

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community) collaboration group: http://www.kanto.meti.go.jp/seisaku/smacom/

[22] See in particular, her arguments on pp 41-2 about the paucity of local leadership, citizen engagement and roles for universities and NGOs. Clarisse Pham, "Smart Cities in Japan," EU-Japan Centre for Industrial Cooperation, October 2014: http://www.eu-japan.eu/sites/eu-japan.eu/files/SmartCityJapan.pdf

But in the wake of Kitakyushu and other projects, there are dozens of other projects building on the flagship model but distinct from it. The newer projects are deepening their deployment of innovations in renewable energy (including renewable heat), ICT-enabled efficiency (in lighting, heating and cooling, etc), mobility, health-care services and other core urban functions.

There appears to be plenty of scope for growth. The most recent survey of Japan's smart communities was undertaken by EcoNet Tokyo 62, and between June 19 and July 4th of this year.[23] The survey sampled all 62 of the EcoNet Tokyo 62 governments, with all of them complying. The survey results show a dramatic increase in awareness of smart communities. Moreover, whereas only 2 of the area governments were in the midst of deploying a smart community in 2012, the figure had risen to 10 by 2014. All told, this year 22 of the 62 member governments were either initiating projects or preparing to, versus a total of 14 in 2012.

The results also showed a consistent focus on energy throughout, even among governments that were simply thinking about undertaking smart communities. In 2012, there were 156 replies (with multiple choices allowed) on the desired goals of the smart community. Of these, 40 sought increased residential energy efficiency, 31 increased office-building energy efficiency, 17 community economic stimulation, 8 enhanced tourism, 11 increased industrial development, 8 enhanced area energy independence, and 36 opted for greater disaster resilience of schools, hospital and other facilities. That means 79 of 156 replies focused on energy, either through efficiency or distributed generation.

In 2014, the total number of replies had risen to 176. Of these, 38 sought increased residential energy efficiency, 29 increased office-building energy efficiency, 15 community economic stimulation, 11 enhanced tourism, 11 increased industrial development, 29 area energy independence, and 36 opted

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[23] The survey results (in Japanese), presented to the Commission on October 8, 2014, are available at:
http://all62.jp/saisei/meeting_h26/meeting_h26_03/meeting_h26_03_05.pdf

greater resilience of schools, hospital and other facilities. In short, 86 of 176 replies focused on energy, either through efficiency or generation. Moreover, the desire for area energy independence leapt from 8 in 2012 to 29 in 2014, showing by far the greatest increase among all categories.

And as we have also seen earlier, the new projects are being given a vehicle – via the Japanified stadtwerke – to ramp up local governments' incentives and ability to lead the projects.

Conclusion

It is interesting that Kashiwagi and others look to Germany with scant reference to their own country's developmental history. Certainly, the proliferation of public corporations in Japan, both local and national, became a focus of administrative reforms, especially during former PM Koizumi Junichiro's (2001-2006) assault on wasteful spending and its finances. There is no denying that the money squandered on unneeded roads and bridges truly was prodigious, and reform essential. But at the same time, there are good reasons Japan's local public corporations were not axed. And it may be instructive to recall how linking finance to these vehicles got important infrastructure rolled out effectively and in a short period of time.[24]

Against this backdrop, the Japanese energy technocrats' decision to use the stadtwerke as the engine for rolling out Japanese smart communities seems likely to have significant consequences. For one thing, the Japanese vision appears to be more ambitious than the German efforts. While Germany is a leader on diffusing renewable power per se, it appears to be rather a laggard in

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[24] For a good recent paper on Japan's financial reforms as a work in progress, which may move to Anglo-Saxon liberalism or revert back more towards traditional models, see Kenji E. Kushida and Kay Shimizu, "Syncretism: the politics of Japan's financial reforms," Socio-Economic Review (2013) 11: http://fiid.org/wp-content/uploads/2014/01/Kushida-Shimizu-2013-Syncretism-financial-reforms.pdf

the EU diffusion of smart cities.[25] Moreover, in contrast to the German smart-city enthusiasts, forced to work in a federal system dominated by what Wolfgang Streeck rightly derides as intellectually bankrupt managers of the "consolidation state,"[26] the Japanese work within a unitary state in which 2/3 of public spending is done locally. The central agencies, including METI (economy), MLIT (infrastructure), MEXT (education), MAFF (primary industries), and MHLW (health and welfare), all have their respective reasons for favoring smart communities. These interests have in part been coordinated by the MIC that oversees local governments' fiscal health and thus is eager to put the stadtwerke model at the core of the smart community.

The fourth-largest economy in the world, Germany's FIT-driven energy shift has had a profound impact on the global public debate and policymaking. Yet if Japan's incipient model finds traction, it may have an even larger impact. Japan is the world's third-largest economy, well over USD 1 trillion larger than Germany, and is now in the midst of an unprecedentedly large economic experiment. Japan's unparalleled need for sustainable economic growth dovetails with an increasingly powerful role of innovative local governments working in tandem with smart elements of key central agencies.

The stadtwerke approach not only puts the local community in charge of the smart community deployment; it also institutionalizes that leadership in a vehicle

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[25] See p 32 European Parliament Directorate General for Internal Policies, "Mapping Smart Cities in the EU," January 2014: http://energytransition.de/2014/06/remunicipalization-of-hamburg-grid/

[26] Streeck brilliantly and concisely explains how the Schumpeter-Goldscheid tax state became the debt state and is now (especially in Germany) a consolidation state that manifests an "uncompromising determination to place its obligations to its creditors above all other obligations" and a coalition of forces that stands in the ways of spending increases and indeed emphasizes cuts on all expenditure other than debt-service payments. See his "Buying Time: the delayed crisis of democratic capitalism," talk on October 20, 2014 at the LSE (http://www.lse.ac.uk/newsAndMedia/videoAndAudio/channels/publicLecturesAndEvents/player.aspx?id=2642). The cited remarks are at the 35:00-minute mark.

with the financial, administrative and other means to take effective action. Japan's model may help turn us away from building smart communities led by behemoths of the private sector. Properly financed and incentivized local governments seem unlikely to allow large corporate actors simply to siphon income from core urban infrastructures and do as they will with data on the residents' consumption, movements and other interactions in the smart community.

Indeed, it is possible Japan could overtake Germany as a model for rolling out smart communities while bolstering inter-regional and interpersonal equity. This assertion – even made tentatively - will likely seem absurd. But the potential exists because of Japan's manifold incentives and capacities as well as the emergence of a powerful group of players willing and able to act on those factors. The dominance of vested energy interests in Japan's political economy is rapidly eroding, while the post-3-11 imperative of local resilience continues to rise higher on the agenda and reshape options in the power economy. Japan is certainly disadvantaged by inept and distracted political leadership at the national level, but that problem is hardly unique to Japan. Dysfunctional national government appears to be our era's most striking point of convergence among the advanced countries' political economies.[27] Where Japan appears to be different is in the sheer scale of its multifaceted crisis and the rise of technocratic vision and action in a big and centralized state. These incentives and action appear to be driving an accelerating shift to green and resilient smart communities. It will clearly be one key area of Japanese economic policymaking to watch in 2015.

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[27] The United States offers one pertinent example. See, for example, David Hayden, "CRomnibus Disaster Signals a Sad New Normal in D.C.," Fiscal Times, December 12, 2014: http://www.thefiscaltimes.com/columns/2014/12/12/cromnibus-disaster-signals-sad-new-normal-dc