

Disaster Risk Reduction and Resilience as Structural Reform in Abenomics 防災とレジリエンス推進としてのアベノミックス流構造改革

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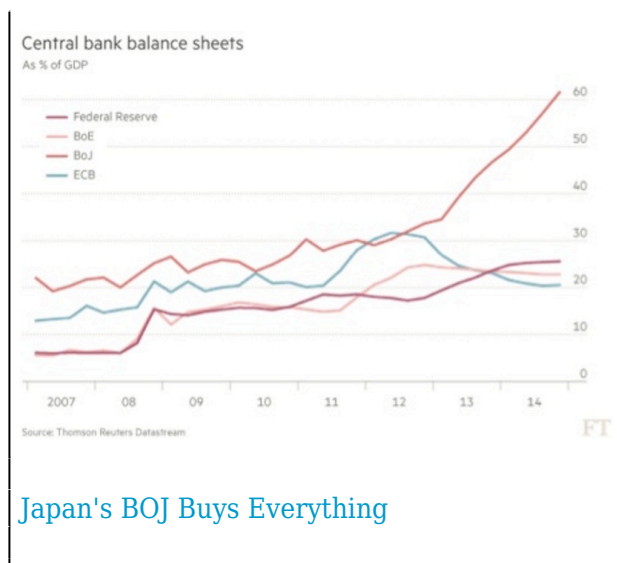
In the waning days of 2014, by far the hottest year humans have ever measured,¹ Bloomberg News warned that the foreign investors who control roughly 70% of volume traded on the Tokyo Stock Exchange "have had just about enough of Abenomics." Decrying that there is no Japanese Facebook or Google, and that the "Japanese have lost their place as global leaders," punters slashed their 2014 investment in Japanese stocks a stunning 94% compared to the previous year.² There are certainly ample grounds to criticize Abenomics. But these speculative investors overlook Japan's climate-resilient spending programmes and accompanying structural reforms. Japan exhibits an emergent, implicit recognition that confronting endogenous shocks, especially natural disasters, is core to sustainable growth. So Japan may have no Facebook, but it is advantaged by something that appears more important: an expanding alliance of politicians, bureaucrats and specialists who are reshaping Abenomics and making the country a global leader in building resilience.

This article summarizes Abenomics and the disappointment of many observers even as Abenomics has come to embrace resilience as a core theme. The article then highlights a few of the proliferating array of projects already underway. The concluding section situates Japan's initiatives in the rapidly growing global movement to match long-term investment with resilience that adapts to and mitigates climate change. This movement will be on display at the January 14-16 "Tokyo Conference on International Study for Disaster Risk Reduction

and Resilience"³ as well as the March 14-18 "UN World Conference on Disaster Risk Reduction" in Sendai.⁴ Thus Japan's projects will be showcased this year, further advantaging resilience over complacent conventional thinking, and offering Japan yet more economic, diplomatic and other incentives to excel.

Abenomics and the Conventional Economy

A brief review of what Abenomics is supposed to be about helps to understand why equity investors and their commentariat are so disappointed with it. The three arrows of Abenomics include 1) massive quantitative and qualitative easing on the monetary front, 2) fiscal expansion followed by consolidation, and 3) structural reform via deregulation and privatization. These arrows are aimed at shocking the Japanese economy out of deflation, into 2% inflation. and then driving it onto a sustainable growth path of 3% per year through private investment and consumer spending. Abenomics thus began as an enormous application of standard Keynesian economic policy tools to restart conventional growth in the world's most conspicuously stagnant economy.



Abenomics got under way after Abe and the Liberal Democratic Party (LDP) won the general election of December 4, 2012, and then secured Kuroda Haruhiko's appointment as governor of the Bank of Japan (BOJ) from April 9 of 2013. Led by Kuroda, the BOJ monetary measures – the first of Abenomics' three arrows – have become increasingly unprecedented in their scale, as the above chart shows. The BOJ undertook an aggressive buying spree of assets, especially Japanese Government bonds (JGBs), to encourage inflation and get people spending as well as force domestic investors to drop JGBs and turn to such "risk assets" as stocks. By mid-December of 2014, the BOJ had vacuumed up over YEN 300 trillion in assets, especially long-term JGBs. The figure shows that, following Kuroda's April 13 appointment, this activism saw the BOJ diverge greatly from the Federal Reserve Bank (FRB), the Bank of England (BoE) and especially the European Central Bank (ECB). BOJ held YEN 165 trillion in assets in March 2013, just over 30% of Japan's GDP. By December 12 of 2014, the BOJ's assets had risen to YEN 300.6 trillion, over 60% of GDP, with roughly YEN 200 trillion of these assets being JGBs. The most recent incarnation of this Abenomics arrow is the "Kuroda Bazooka 2," unveiled on October 31, Halloween Day of 2014, a desperate expansion of monetary policy that shocked markets.⁵

Kuroda's "Bazooka 2" programme could see BOJ holdings of long-term JGBs balloon to YEN 280 trillion by the end of 2015. It is thus encouraging that wise heads are effectively pointing Kuroda's weapon at resilience.⁶



Abenomics' second arrow of fiscal policy initially started off with a YEN 10.3 trillion stimulus package introduced in January of 2013. The package included a mix of traditional infrastructure spending. Most observers discount this aspect of the Abenomics programme, spending as short-run stimulus to give time for structural reforms to be undertaken and gain traction, rather than part of long-term structural policy itself. But they should have looked more closely: Japan's spending measures also included an emphasis on resilience, a policy track that has become increasingly salient in Japanese government programmes in the wake of 3-11.⁷ Additional conventional fiscal measures followed, through supplementary budgets. Yet along with those initiatives, there were more moves to bolster national resilience through a long-term fiscal plan as well as an organizational structure. The National Resilience Promotion Headquarters was thus instituted in December of 2013⁸ and was later followed by the July 1 establishment of the Japan Association for Resilience.⁹



But the second arrow of fiscal policy also includes fiscal consolidation due to the gargantuan size of Japan's public debt. Hence the April 1 2014 increase in the consumption tax from 5% to 8%, which had a much more deleterious effect on growth than policymakers anticipated. This outcome led to delay in the next scheduled increase of the tax (to 10%), from October of 2015 to April of 2017. Desperate to get growth going, on December 27, 2014 the Abe cabinet announced a YEN 3.5 trillion economic stimulus package.¹⁰ This spending is targeted at various initiatives, including YEN 1.2 trillion aimed at reducing energy and service costs for low-income citizens (including household energy-efficiency as well as deployment of renewables and storage) and YEN 600 billion for revitalizing local communities. The remaining YEN 1.7 trillion is aimed primarily at bolstering resilience of waterworks and other social infrastructures in the face of natural disasters such as earthquakes and typhoons.¹¹

The third arrow of Abenomics is structural reform. This arrow is often regarded as the most important of the three, because conventional economics sees the first two arrows as aimed at creating the growth and inflationary expectations that allow

policymakers the leeway to undertake deep reforms to rules and regulations deemed antagonistic to innovation and self-sustaining growth. The first iteration of Abenomics' structural reform was released, bit by bit, from late May to the middle of June in 2013, with a June 14 publication as the "Japan Revitalization Strategy." Most business analysts were disappointed at the welter of details, replete with long-range plans. They wanted to see concise and decisive deregulation in labour markets, corporate governance and other areas, reforms that would lead to a more flexible deployment of land, capital, labour and other resources so as to secure the rising productivity and incomes essential to robust conventional growth.¹² The third arrow subsequently went through various amendments in response to the deluge of criticisms from mainstream observers as well as due to changing priorities as Japanese experts' understanding of resilience evolved.



The most astute mainstream observer of the Japanese economy, *Oriental Economist* editor Richard Katz is dismayed at the result, and derides the overall project as "vague sloganeering" in a *Foreign Affairs* article titled "Voodoo Abenomics."¹³ We noted above that Katz is not alone in his dismissal of Abenomics. From the mainstream, market-oriented perspective, resilience is at best a side show

and Abenomics is losing credibility because Japan is unlikely to join the 12-nation free-trade Trans-Pacific Partnership (TPP) agreement or make significant progress on a laundry-list of other conventional objectives. Many domestic Japanese observers concur: in a December 29, 2014 editorial Japan's centrist *Mainichi Shimbun* argued that the third arrow had "failed to bring any decisive results." The *Mainichi* declared to PM Abe that "now is the time to truly eliminate the sectionalism of government ministries and agencies and dedicate efforts to the structural reform of agriculture and other sectors."¹⁴ Even the December 27, 2014 *Yomiuri Shimbun*, an otherwise stalwart supporter of Abe's constitutional revisions and economic plans, editorialized its worries about the potential for waste in the new stimulus package.¹⁵

To be sure, there is plenty wrong with the Abe programme. For example, it is patently absurd to stimulate new home construction when Japan has 8.2 million homes empty, roughly 13.5% of total housing stock.¹⁶ There is no doubt that a considerable portion of Abenomics' various stimulus measures is being used less effectively than it might be. It would also be a disservice not to emphasize that plenty of Japan's 3-11 reconstruction money was squandered, and that the tragedy of Fukushima's nuclear meltdowns continues its costly unfolding.¹⁷ But mere cynicism or outrage at Abe and Abenomics risks obscuring the fact that impressive innovation is underway and is part of a global trend. These developments would surely benefit from a dispassionate analysis.

Resilient Infrastructure



The Aftermath of 3-11 in Japan

Resilience seems a side show for observers who are not paying attention to the pace of climate change as well as the incredible scale of built infrastructure and evidence of its vulnerability. Fortunately, Japanese experts are paying attention and have increasing influence in policymaking. Prominent among the 138-page (in English) June 2013 Revitalization strategy – the third arrow – were the keywords "energy," "big data," "ICT," "disaster" and "resilient infrastructure."¹⁸ Subsequent iterations of the growth strategy, especially among the individual ministries and agencies, have since seen increased emphasis on these critical elements.¹⁹ As described below in more detail, other budgets have expanded, with a focus on resilience through distributed energy and the associated infrastructure.

What has been unfolding over the past two years of the Abe regime, within its shifting definition of Abenomics, is a new paradigm of resilient urbanization. We should hardly be surprised by this development, as well as the fact that – among the waste – there is a great deal of productive public investment going on in Japan. The country was, after all, hit with history's costliest natural and nuclear disaster on March 11, 2011. Moreover, Japanese government, business and the public (especially in the Tohoku and Kanto areas) had to endure months of power outages following the disaster. This protracted crisis delivered a powerful lesson in the vulnerability of conventional, centralized power and other infrastructure and the need to reassess the

costs and benefits of distributed power and other critical systems.²⁰



Superstorm Sandy's effects on New York City's infrastructure

In addition to their direct and unforgettable disaster lessons via 3-11 and its aftermath in their own country, Japanese engineers, urban planners, energy experts and other actors also became part of a global discourse and rapidly expanding practice of resilience. This global project is not simply about technology but also includes new modes of financing, governance and other aspects relevant to reshaping core infrastructures deeply embedded in our daily lives.²¹ And this international movement was greatly accelerated after 3-11 by such massive events as Superstorm Sandy's devastation of New York City in late October of 2012 as well as Typhoon Haiyan's devastation of a large swathe of the Philippines in November of 2013. Perhaps just as significant as these major disasters has been the less spectacular damage wrought by intense rain and other episodes of extreme weather, on transport, waterworks, and other systems.²²

Building Resilience in Kawasaki City

One of Japan's most recent and prominent examples of constructive spending on resilience is Kawasaki City (population 1.453 million). On

December 24, 2014 Kawasaki announced a YEN 500 million special programme of smart city and distributed energy investment based on funds from the Ministry of Environment's (MOE) YEN 22 billion Green New Deal (GND) programme for FY 2014.²³ A particularly interesting aspect of Kawasaki's plan is that renewable power is framed in a larger discourse of building resilience in the face of disaster threats. This resilience argument is common to Japan's myriad smart community projects, but a look at the attached map shows why it has special meaning for Kawasaki. The city's plan highlights its position between Tokyo Metro and Yokohama. The plan is grounded on estimates that - across the entire region - disaster may see as many as 5.15 million people rendered unable to return home. The city's document depicts renewable energy as essential not merely to power various emergency functions (e.g., firefighting, search and rescue) in a disaster, but also to provide information, lighting and other basic services to the large numbers of workers, travellers and others displaced by an earthquake, large storm or other calamity.



Building regional resilience in Kawasaki City, Japan

Kawasaki's YEN 500 million from the MOE's

GND fund will represent 7% of the city's investment in renewable energy over 2014 to 2016. In terms of power-output capacity, the MOE support will contribute 175 kW to the city's plan to add a total of 2,400 kW of renewable power to city schools, city offices, water-treatment facilities and other assets over 2014 to 2016. The city also plans to use some of the MOE money to add 30 kW to private homes and business over the same period. This is part of Kawasaki's programme of increasing renewable deployment in this sector, in 2014, by 3700 kW.

Kawasaki's plans do not end there. Like many other cities, large and small, it is working towards realistic environmental goals. It aims to cut greenhouse gas emissions by 25% by 2020 (versus 1990 levels). To achieve this ambition, the city will – among other projects, including efficiency, conservation and storage – increase its deployment of solar power and heating by 30 times between 2005 and 2020.²⁴

Smart Communities and Resilience

As noted earlier, Kawasaki's aims are shared by most of Japan's rapidly proliferating smart community projects.²⁵ In an August 15, 2014 report, the Daiwa Institute of Research noted that 82.2% of local government respondents (surveyed for the Japanese Agency for Natural Resources and Energy) view smart communities as a means of ensuring energy independence in disasters. The next highest result in the survey, which allowed multiple choices, was 73.3% aiming to bolster energy independence per se, meaning not just during disasters. That result was then followed by 71.1% anticipating the emergence of new services and industries for employment opportunities.

Japan's projects take place against the backdrop of a global debate over smart cities that sometimes warns that they are a technocentric and relentlessly top-down enterprise

that "will destroy democracy."²⁶ Such rhetoric either ignores the climate threat or represents it as a "shock doctrine" discourse legitimating greater privatization and other evils of our age. Other observers, such as Rob Kitchin, suggest that critical scholars and technically oriented academics, policymakers and businesspeople need to learn more from one another.²⁷ In this swirl of opinion and observation, Daiwa's report suggests a progressive narrative might be underway in Japan. The competences and capacities of Japan's local governments to lead smart communities are increasing while the concept itself is expanding to include socioeconomic sustainability. Daiwa researchers plowed through the Japanese documentation, and found that there are multiple aims in Japan's initiatives, and that these aims address participation as well as technology. Thus the report proposes that the smart community be broken down into the two main areas of:

1) Social Sustainability and 2) Economic Sustainability.

"Social Sustainability" encompasses the following subcategories:

1) resilience in the face of disasters, which comprises:

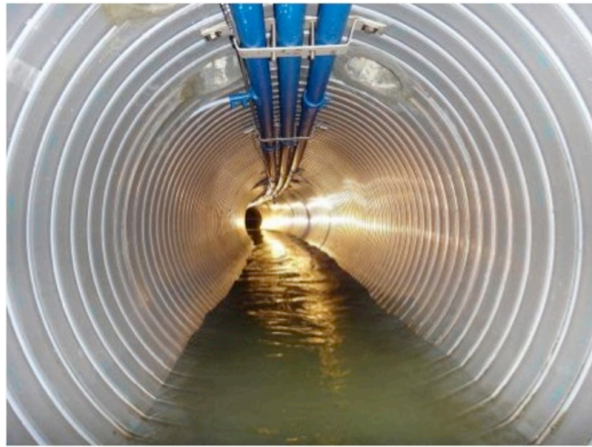
- a) rapid and widespread information on disasters
- b) energy independence
- c) predictivity and prevention in dealing with aging infrastructure
- d) increasing the resilience of governance.

2) "safety and security," which comprises:

- a) increasing linkages among local areas

- b) the prevention of crime
- c) increasing urban density
- d) guidance on health management and the prevention of disease.

"Economic sustainability" comprises the promotion of industry and reduced costs of local administration. The promotion of industry focuses on a) revitalization of existing industries b) creation of new industries c) reduction of industries' energy costs.²⁸



Sendai's Heat-Recovery Sewerage Test

The Daiwa report does not go into detail on reducing the costs of local administration. But in this regard one initiative it might have spotlighted is the use of information and communications technology (ICT) and robotics to cheapen the costs of monitoring and maintaining such infrastructure as Japan's nearly 460,000 kms of sewerage pipes. This infrastructure is ageing and already sees 4000-5000 road subsidence incidents per year, even as local governments are already running short of personnel to do the requisite maintenance checks.²⁹ Sewerage initiatives will

also include the deployment of advanced technology to recover otherwise wasted heat from within the system, further bolstering resilience. At present, a test underway in Sendai (between the city and Sekisui Chemicals) seeks to recover energy from the pipe itself, a first in Japan.³⁰ This test will be in its concluding phase during March of this year, nicely coincident with Sendai's hosting of the UN-sponsored event on disaster resilience.

Resilience as a Broad Narrative

One reason Japan's understanding of the smart community has become so broad-based, addressing multiple dimensions of urban life, is that 3-11 and subsequent events saw Japan's circumscribed, small-scale projects roll out across the community as a whole.³¹ That expansion of the ambit of the projects compels them to be more inclusive.



Koizumi Shinjiro speaks on Next-Generation Energy

Another reason is that some of Japan's most popular and influential national-level politicians, such as 33-year old Koizumi Shinjiro (Vice-Minister for Reconstruction), are in charge of smart-community-related initiatives and have learned how valuable they

are for resilience against disasters and for economic opportunity. Koizumi helps oversee a reconstruction area featuring numerous smart communities whose "local production-local consumption" renewable-energy model's diffusion nationwide informs LDP growth strategies and resilience policy.³²

Another reason, related to the foregoing, is that a significant stream of politicians, technocrats and analysts look to democratically representative local governments as the locus for diffusing distributed energy and other elements of the new paradigm. Smart communities are thus seen not as a paradise of privatization, but rather as empowered, democratic agents for acting in the face of vested interests³³ as well as the regulators who (actively or passively) side with the status quo by not revising rules to facilitate change.³⁴ Indeed, the Japan Association for Resilience initiative itself has, among its working groups under development, councils on the smart community, ICT, decarbonizing use of cross-laminated timber, hydrogen-energy systems, empty houses ("akiya"), and other areas that reflect a broad conception of resilience.³⁵

Budgets also increasingly reflect the fact that "resilience" is providing a focus for all that Abenomics money. The FY 2015 budget is, of course, yet to be compiled and passed. But the METI requests relating to distributed energy have been compiled by the LDP's policy committees and released in summary form. The release notes the commitment to maximizing the diffusion of renewable energy as well as using the feed-in tariff (FIT). The document then summarizes FY 2015 requests related to diffusing renewables (including bolstering the grid) as YEN 214.2 billion versus YEN 121.5 billion in FY 2014. Together with energy efficiency and smart communities, the FY 2015 request is 363.7 billion as compared to YEN 212.6 in FY 2014.³⁶

It is important to add that the above

expenditures do not include the deployment of ICT and heat-recovery systems in the massive sewerage and other core infrastructures that are under the purview of the Ministry of Land, Infrastructure, Transport and Tourism's (MLIT). These MLIT projects are clearly key elements of resilience, whether seen as the capacity to deal with disasters or as the ability to reduce energy consumption (through precisely monitoring and adjusting water flows) as well as harvesting otherwise wasted energy. A similar story concerns expenditures by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) on bolstering the resilience of schools (with a stronger role as disaster-relief shelters) via the deployment of renewable-energy systems (primarily solar) and back-up batteries.³⁷

Virtually all of the central agencies (as well as many of the local governments themselves) have significant projects that could (and should) be included under the rubric of smart-community resilience, distributed energy, and related categories. Many spending programmes are not included, however, either because they are emergent areas (as we see with heat-recovery in sewers), they get lost in inter-agency stove-piping, or sometimes it is simply too difficult to tease out the resilience aspect of spending in upgrades to existing infrastructure.³⁸

Conclusion: Putting the Long-Term into Abenomics

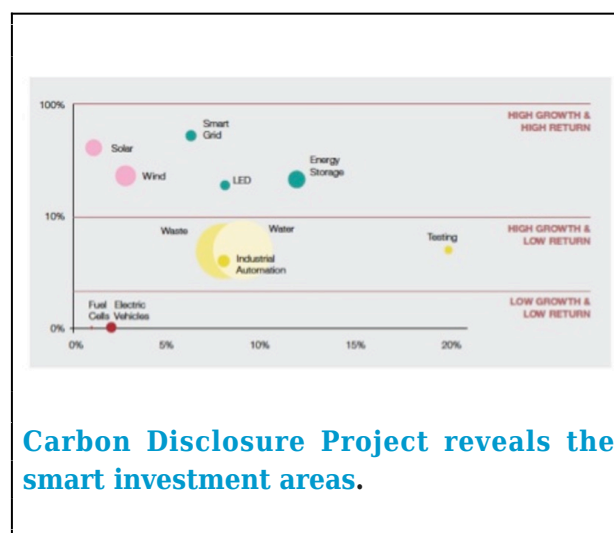
Both Abenomics' dwindling band of boosters and its growing crowd of critics are evidently uninterested in building resilience in the face of climate change. But as this article details, adapting to and mitigating climate change via distributed energy and other smart infrastructures are already key themes in Abenomics and are positioned to become even more salient in 2015 and beyond. Moreover, Japan's initiatives are important not only for bolstering its own resilience, but also for

encouraging more rapid and comprehensive deployment of disaster-resilient infrastructure overseas. In the United States, for example, the *National Geographic* warns that "extreme weather is exposing the vulnerability of 20th century water infrastructure," and details the emergent response: constructive structural reform and innovation in US water systems, both to adapt to climate change as well as mitigate it where possible.³⁹ Moreover, America's power, transport, communications and other infrastructures are also threatened, as is true of such core urban infrastructures almost everywhere.⁴⁰ Yet resistance from US climate change skeptics, tight budgets, distracted politics, conventional thinking and other factors are impeding comprehensive action nationwide: "A study by the Georgetown Climate Center at the Georgetown University Law Center found that fewer than half the states have adopted state-led adaptation plans, or even have such work in progress."⁴¹ A better understanding of Japan's resilience initiatives may aid their expansion in the US and elsewhere.

And the time to get a better understanding of Japan's projects is now. One major reason is, as we saw earlier, the BOJ's "Bazooka" is not just trying to encourage inflation but also push investors out of JGBs. JGBs have almost minimal return but are viewed as safe, and the BOJ wants investors to move into riskier investments. When the BOJ's Kuroda unveiled his bazooka last Halloween, the Japanese Government Pension Investment Fund (GPIF), the world's largest at YEN 127.3 trillion, announced that it would shift its investment strategy. GPIF holdings as of the end of September 2014 included 58% in JGBs, 16% in domestic stocks, 13% in overseas stocks and 10% in overseas bonds.⁴² But now the GPIF appears committed to putting half its capital in local and foreign stocks (25% in each), which seems very unwise considering the volatility of stock markets.⁴³ The Carbon Disclosure Project's (CDP) November 12, 2014 report on

Carbon Action includes a useful chart that illustrates growth and returns in the Resource-Efficiency Sector, which is broadly the resilience initiatives discussed above. The CDP analysis suggests that core aspects of resilience and smart infrastructure would be a safer bet than equities for the GPIF's capital.

Understanding Technology in the Resource-Efficiency Sector



Against the backdrop of a Japan (and an Abenomics) that is increasingly committed to a real resilience, the GPIF could indeed help lead a revolution among long-term capital. Together with the Development Bank of Japan, on February 28, 2014 the GPIF had already expressed its interest in investing in infrastructure, in such fields as "power generation, electricity transmission, gas pipelines and railways."⁴⁴ But the amounts under consideration are as yet well below 1% of the fund's capital. The fact that the GPIF is merely sticking its toe in this area is no surprise: numerous transaction costs, such as lack of familiarity, scarce personnel networks and other hurdles, hinder the world's roughly USD 70 trillion in institutional capital, like the GPIF, from investing heavily in the global infrastructure market. At the same time, this market is likely to be a cumulative USD 57 trillion to USD 67 trillion between 2013 and

2030, and green, decarbonizing infrastructure is key to coping with population pressures, resource crises (especially water) and the imperative of resilience.⁴⁵

And yet we may be at a profound tipping point. As long-time observer Isabel Hilton remarks concerning the December 2014 talks in Lima Peru, the World Bank Group vice president and special envoy for climate change is explicitly arguing that it is urgent to "get big institutional investors and pension funds to invest in sustainable growth, particularly renewable energy, and to get major companies, the industrial sector, and large cities to understand that climate risk is huge and that they must revise their strategies and address it."⁴⁶

The next big step in linking all these threads together could be the University of Tokyo January 14-16 "Tokyo Conference on International Study for Disaster Risk Reduction and Resilience."⁴⁷ Part of the agenda will be the UK Royal Society's report on "Resilience and Extreme Weather," which was released on November 27, 2014 and details the need for a profound rethink in accounting practices as well as coordination in the era of growing climate crisis.

And following on that event is the even larger March 14-18 "UN World Conference on Disaster Risk Reduction" in Sendai.⁴⁸ These gatherings are an opportunity to showcase the resilience initiatives ongoing, accelerated by 3-11 and Japan's debt and demographic desperation. Relative to other developed and developing countries, Japan is advantaged by generally effective governance,⁴⁹ high population density, wealth, and clusters of innovation excellence in addition to extreme exposure to collective environmental threats. These assets and threats are among the drivers of the country's evolving economic strategy, expanding the new and promising niche of resilient and smart communities. As we saw in the projects described earlier, a vast enterprise

is unfolding that is not yet fully envisioned, let alone packaged, into a comprehensive, sustainable growth model. It has had to contend with the short-sighted domestic and international chorus that ignores climate change and instead calls for a reboot of the conventional economy. Nevertheless, in the coming months Japan could emerge at the lead of a revolution in the mechanisms and targets for smart and resilient long-term investment.

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Notes

¹ Joe Romm, "2014 Was Hottest Year On Record Globally By Far, Reports Japan Meteorological Agency," January 5, 2014.

² Yuji Nakamura and Yuko Takeo, "The 94% Plunge That Shows Abenomics Losing Global Investors," Bloomberg News, December 29, 2014.

³ On the event, [see here](#).

⁴ [The conference website](#).

⁵ See Yoichi Takita, "Japan's elusive inflation target," Nikkei Asian Review, December 25, 2014.

⁶ See "Bank of Japan's assets top 300 trillion yen for first time," Nikkei Asian Review, December 13, 2014.

⁷ On the details, see p 4 of (in Japanese) "Current Assessment of the Results of the Abe Cabinet's Fiscal and Economic Policies," Japanese Cabinet Office, June 13, 2014.

⁸ Many of the major initiatives are described (in

Japanese) at the Japanese Cabinet Office website's section on National Resilience: http://www.cas.go.jp/jp/seisaku/kokudo_kyoujin_ka/

⁹ The Association's website is [here](#).

¹⁰ See "Abe cabinet approves 3.5 trillion yen package," Nikkei Asian Review, December 28, 2014: Abe cabinet approves 3.5 trillion yen package."

¹¹ On the details, see (in Japanese) "Total of YEN 3.5 trillion economic stimulus okayed by cabinet," NHK News, December 27, 2014.

¹² See "The Third Arrow of Abenomics: Misfire," The Economist, June 15, 2013.

¹³ See Richard Katz, "Voodoo Abenomics: Japan's Failed Comeback Plan," Foreign Affairs, July/August 2014.

¹⁴ See "Editorial: Third Abe Cabinet should listen to dissenting voices," Mainichi Shimbun, December 29, 2014.

¹⁵ See (in Japanese) "The YEN 3 Trillion Stimulus: No Expectations of Local Laxity?" December 27, 2014.

¹⁶ For the data, see (in Japanese) "Tax reform aim is to eliminate lower rate on empty homes," Tokyo Shimbun, December 27, 2014.

¹⁷ On waste, see for example "Waste undermines reconstruction," Japan Times, January 19, 2013.

¹⁸ See "Japan Revitalization Strategy," Japan Cabinet Office, June 14, 2013.

¹⁹ One recent example is the Ministry of Internal Affairs and Communications (MIC) May 30, 2014 discussion (in Japanese) of its "Distributed Energy Infrastructure Project"

²⁰ For an overview, see Andrew DeWit, "3.11

and Japan's Shift to Smart, Distributed Power," Asia Policy 17, January 2014.

²¹ See, for example, Michael Puckett "Financing the Next Generation of Resilient Power," Clean Energy Finance Forum, November 25, 2014.

²² One example was the August 20, 2014 mudslides in Hiroshima, which were part of a protracted period of very unusual rainfall. See Andrew DeWit, "Hiroshima's Disaster, Climate Crisis, and the Future of the Resilient City", The Asia-Pacific Journal, Vol. 12, Issue 35, No. 2, September 1, 2014.

²³ Kawasaki City's announcement is at the city's website (in Japanese), "[Kawasaki City Renewable Energy and Other Introduction Promotion Fund Projects \(FY 2014-2016\)](#)," Kawasaki City, Japan, December 24, 2014.

²⁴ See the entire plan (in Japanese) "[2014 Renewable Energy and Other Introduction Promotion Fund Projects \(Green New Deal Fund Projects\)](#)," Kawasaki City, Japan.

²⁵ On the projects, see Andrew DeWit, "[Japan's Resilient, Decarbonizing and Democratic Smart Communities](#)", The Asia-Pacific Journal, Vol. 12, Issue 50, No. 3, December 15, 2014.

²⁶ Stephen Poole, "[The truth about smart cities: 'In the end, they will destroy democracy'](#)," The Guardian, December 17, 2014.

²⁷ Rob Kitchin, "[Making sense of smart cities: addressing present shortcomings](#)," Cambridge J Regions Econ Soc, October 21, 2014.

²⁸ See Oguro Yukiko (in Japanese) "[Smart Community: The Sustainable City](#)," Daiwa Institute of Research, August 15, 2014.

²⁹ For an overview of the scale of Japan's sewerage infrastructure as well as its challenges and countermeasures, see (in Japanese) "[Planned Reconstruction and Maintenance](#)," MLIT, (nd).

³⁰ The test will finish its trials in March of 2015, coincident with the UN-sponsored disaster event. On the test, see (in Japanese) "[Japan's first system for heat recovery from the sewer](#)," January 6, 2014.

³¹ On this, see the chart on p. 13 (in Japanese) of Tokyo Metro 62 Committee on Renewable Energy and Smart Communities draft at "[Mid-Term Report: Guidelines for Constructing Smart Communities and Surveys of Basic Plans](#)," February 4, 2014.

³² See p. 16 (in Japanese) "[Digital Japan 2013: Taking Back Japan with ICT](#)," May 21, 2013.

³³ This aim is clear in Japan's top energy technocrat, Kashiwagi Takao's chairing of the MIC Commission for Deploying a Local-Government-Led Community Energy System." This Commission was created by MIC on November 4 of 2014, 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 March of 2015. 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.

³⁴ On these items, see pp 10-12 of (in Japanese) NTT Data's Social and Environmental Strategy Unit presentation to METI on "[The Potential for Realizing Smart Business and the Means of Local Government Collaboration](#)," Muraoka Motoji, July 25, 2014.

³⁵ See (in Japanese) the list.

³⁶ See (in Japanese) "[Fiscal Year 2015 Main Points of the Requests Concerning the Promotion of Distributed Energy](#)."

³⁷ This programme pre-dates 3-11, but has now come to include increasing the schools' capacity to function as a shelter during

emergencies. See "[The Role of the School as the District's Shelter](#)," MEXT, March 7, 2014.

³⁸ These problems are true of the US as well: "It is difficult to calculate how much states and cities are spending on climate change adaptation because the money frequently is folded into other projects, such as infrastructure upgrades," in Rita Beamish, "[States, Cities Brace for Global Warming Fallout](#)," Stateline (The Pew Charitable Trusts), December 23, 2014.

³⁹ See Sharlene Leurig, "[Is Climate The Mother Of Innovation?](#)" National Geographic, November 24, 2014.

⁴⁰ On the threats from floods, droughts and heat waves, see the Royal Society report on "[Resilience to Extreme Weather](#)," November 27, 2014.

⁴¹ Rita Beamish, "[States, Cities Brace for Global Warming Fallout](#)," Stateline (The Pew Charitable Trusts), December 23, 2014.

⁴² Yoshiaki Nohara, Anna Kitanaka and Shigeki Nozawa, "[Japan's GPIF to Invest \\$2.7 Billion in](#)

[Infrastructure](#)," February 28, 2014.

⁴³ Toru Fujioka and Masahiro Hidaka, "[Kuroda Surprises With Stimulus Boost as Japan Struggles](#)," Bloomberg News, October 31, 2014.

⁴⁴ See "[GPIF and DBJ Launch Infrastructure Investment Program Under Co-investment Agreement With OMERS](#)," Development Bank of Japan, February 28, 2014.

⁴⁵ Michael Diekmann, "[Smart alternatives to fund infrastructure](#)," Project M, December 2014. And as

⁴⁶ [46] Isabel Hilton, "[Beyond Lima: Major Investors Must Fund Global Green Initiatives](#)," Yale Environment 360, December 15, 2014.

⁴⁷ [On the event](#).

⁴⁸ [The conference website](#).

⁴⁹ If this seems absurd, in light of Fukushima and other real gaps in governance, consider how well Japanese cities work, in transport, policing, waterworks, and other basic services, compared to their counterparts in the developed and developing world.