

Study of In-Data Centre Backup Offices for Banks

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Agenda

1. Mission statement of the Banks in Japan
2. The trigger event review with the Tohoku Pacific Earthquake on 11th March, 2011
3. The direct impact study: the earthquake and the tsunami
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1. Mission statement of the Banks in Japan

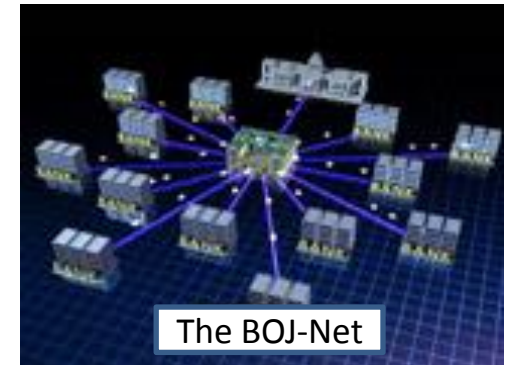
The BOJ's mission statement (The Bank of Japan)

To continue social and public support systems, such as cash supply and money transfer

To continue settlements

To manage risk and the economic impact of bad loans, etc

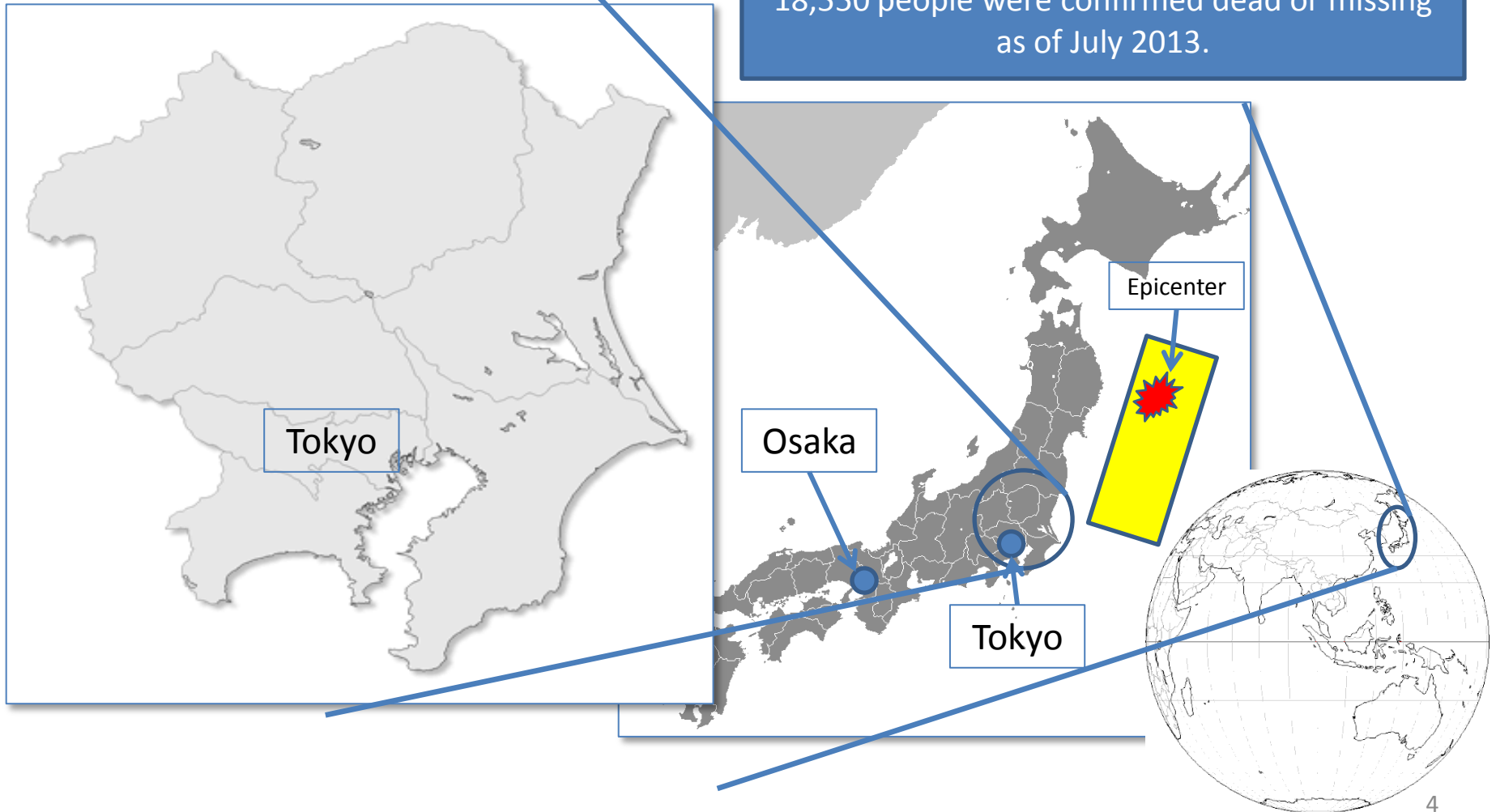
The BOJ-Net, the Japanese yen (domestic) settlement system to which all domestic banks and major international banks are connected, manages a total of over 100 trillion Yen (about 1 trillion Euro) per day on average



<http://www.boj.or.jp/announcements/education/thisisboj.htm/>

2. The trigger event review with the Tohoku Pacific Earthquake on 11th March, 2011

The scale was Moment Magnitude (Mw) 9.0 and 18,550 people were confirmed dead or missing as of July 2013.



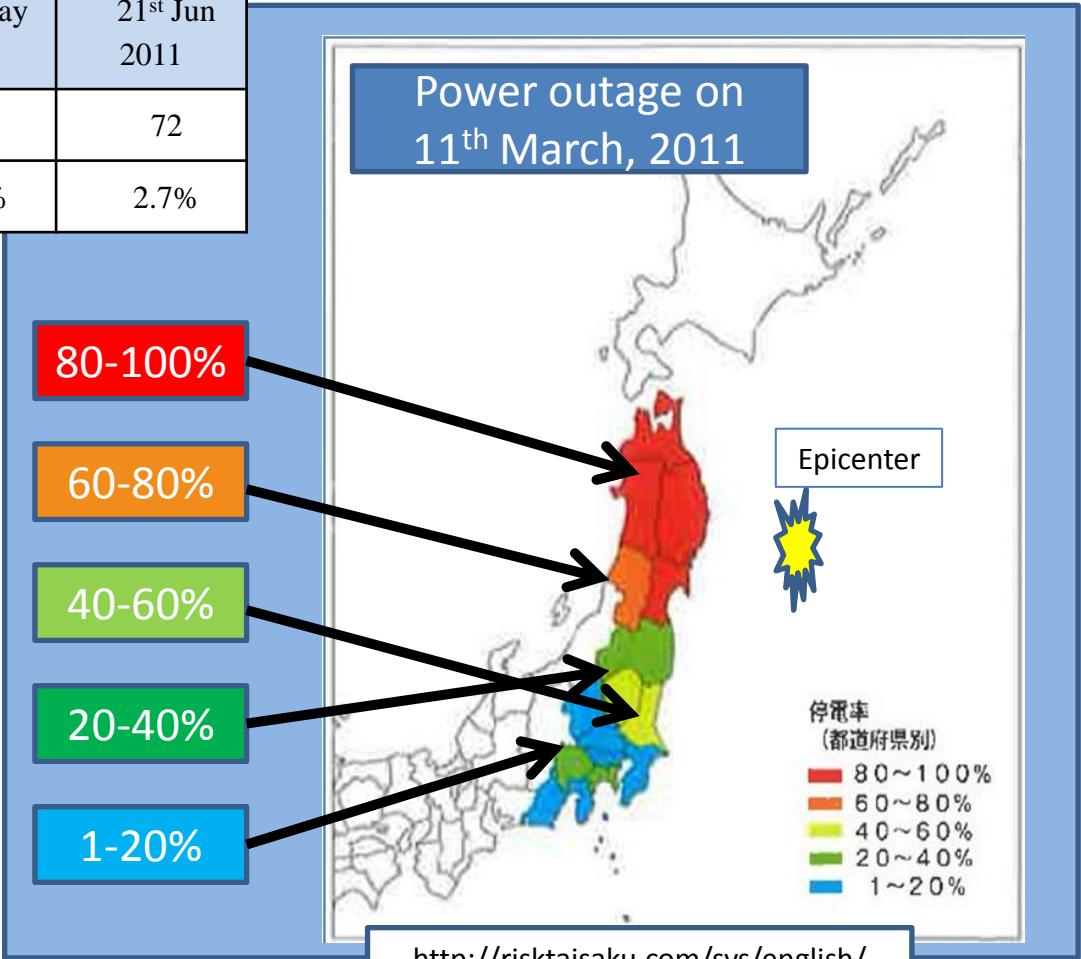
3. The direct impact: the earthquake and tsunami

Table 1: Closed branch offices of banks in the Tohoku region

16 th Mar 2011	28 th Mar 2011	4 th Apr 2011	2 nd May 2011	21 st Jun 2011
310	170	150	97	72
11.5%	6.3%	5.6%	3.6%	2.7%



<http://www.kahoku.co.jp/>



4.1 The indirect impact study: the scheduled power shutdown in Tokyo metropolitan area

The capacity of electricity power generation by TEPCO (Tokyo Electric Power Company) was 40% down from 52GW/h to 31GW/h.

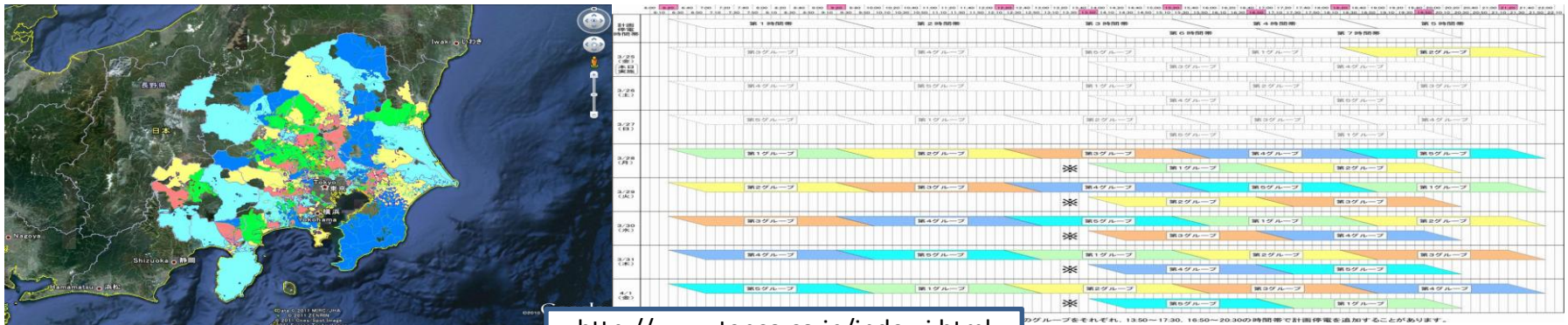
TEPCO announced that they had to proceed with a series of scheduled power shutdowns to avoid blackouts in the Tokyo Metropolitan area. Over 57million households were impacted by this programme in the first 9 days, and there were 73hours and 50 minutes of outage time in total.

Table 2: Impact of the scheduled power down in Tokyo metropolitan area

Date	Did the scheduled shutdown take place?	Number of households got impact with it	Total hours of outage per day	A: TEPCO's electricity power generation capacity	B: Anticipated electricity demand	A - B: Demand-supply gap
14 th Mar	Y	113,000	1:30	31.0GW	41.0GW	-10.0GW
15 th Mar	Y	5,020,000	12:40	33.0GW	35.0GW	-2.0GW
16 th Mar	Y	10,920,000	15:40	33.0GW	35.0GW	-2.0GW
17 th Mar	Y	18,160,000	15:40	33.5GW	40.0GW	-6.5GW
18 th Mar	Y	13,680,000	15:40	35.0GW	37.0GW	-2.0GW
19 th Mar	N	0	0	34.5GW	31.0GW	+3.5GW
20 th Mar	N	0	0	34.5GW	29.0GW	+5.5GW
21 st Mar	N	0	0	35.5GW	34.0GW	+1.5GW
22 nd Mar	Y	9,990,000	12:40	37.0GW	37.0GW	0

4.2 The indirect impact study with the scheduled power shutdown in Tokyo metropolitan area

TEPCO split the area into 5 zones and stopped providing electricity for 2-3 hours one after another. Japan Post Bank announced that they would shut down 1,100 branch ATMs as well as all out of branch ATMs in Tochigi, Gunma, Ibaraki, Saitama, Chiba, Kanagawa, Yamanashi, Shizuoka (East area only) and 220 out of branch ATMs in Tokyo's 23 Wards. According to this information approximately 3,000 ATMs were to shut down.



<http://www.asahi.com/>

5. Dependencies and Criticality Tier

According to the business and market impact, each business in Barclays is categorized from Tier 1 to 5. Those are matched with the RTO (Recovery Time Objective) of each business. Premises where each business is working, also have a “Tier”, that is a sort of facility spec to meet with the RTO of each business. Of course Tier 1 grade premises are much more expensive than Tier 5 ones. This is applied not only to the main office but also to the backup office.

A sample of the criticality tier

Tier	Business RTO (Recovery Time Objective)	Building specifications with power generator
Tier 1	0 – 2 hours from the incident	N+1* power generator
Tier 2	2– 8 hours from the incident	N+1 or N power generator
Tier 3	8 – 24 hours from the incident	N power generator
Tier 4	24 – 36 hours from the incident	Not required
Tier 5	More than 36 hours from the incident	Not required

N+1: Installing an extra generator beyond the anticipated demand and normally one is kept switched off.

6.1 Market research : Backup office in the Kansai Region

Checking with 27 office buildings of the top office vendors, find that 25.9% offices don't have power generator backup, 60.4% have small ones to support just public facilities such as elevators and emergency lights, and only 3.7% (1 among 27) has a power generator to support tenants

Table 7: A pre-RFP hearing if the office building has a power generator back up

Candidates	Area	Answer
Office-01	Central business district	They don't have a power generator back up
Office-02	Central business district	They don't have a power generator back up
Office-03	Central business district	They don't have a power generator back up
Office-04	Central business district	They don't have a generator to support tenants
Office-05	Central business district	They don't have a generator to support tenants
Office-06	Central business district	They don't have a power generator back up
Office-07	Central business district	They don't have a power generator back up
Office-08	Central business district	They don't have a power generator back up
Office-09	Central business district	They don't have a generator to support tenants
Office-10	Central business district	They don't have a generator to support tenants
Office-11	Central business district	They don't have a generator to support tenants
Office-12	Central business district	They don't have a generator to support tenants
Office-13	Central business district	They don't have a generator to support tenants
Office-14	Central business district	They don't have a power generator back up
Office-15	Central business district	They don't have a generator to support tenants
Office-16	Central business district	They don't have a generator to support tenants
Office-17	Central business district	They don't have a generator to support tenants
Office-18	Suburb of Osaka	They have a generator to support the tenant
Office-19	Suburb of Osaka	They don't have a generator but we can provide a space for the tenant to set up their own generator
Office-20	Suburb of Osaka	They don't have a generator to support tenants
Office-21	Suburb of Osaka	They don't have a room for office but a storage
Office-22	Suburb of Osaka	They don't have a generator to support tenants
Office-23	Suburb of Osaka	They don't have a room for office but a storage
Office-24	Suburb of Osaka	They don't have a generator to support tenants
Office-25	Suburb of Osaka	They don't have a generator but they can provide a space for the tenant to set up their own generator
Office-26	Suburb of Osaka	They don't have a generator but they can provide a space for the tenant to set up their own generator
Office-27	Suburb of Osaka	They don't have a generator to support tenants

6.2 Market research : Backup office in the Kansai Region

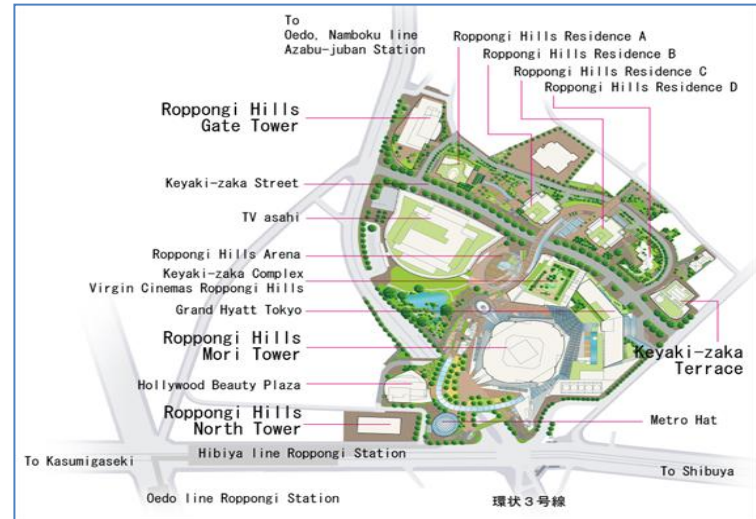
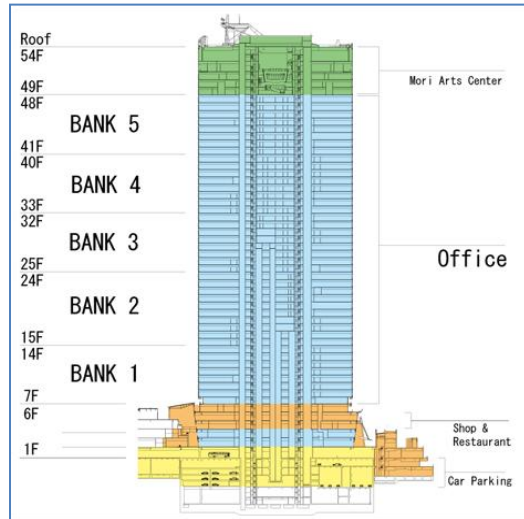
Checking with 32 DC buildings of the top DC vendors but 81.3% (26 DC vendors among 32) declined creating an office space in DC due to reasons of security policies, while just 6.3% (2 among 32) of them accepted and provided quotations.

Table 8: A pre-RFP hearing if a customer can use a room in a DC for an office

Candidates	Answer	Reason
DC-01	Decline	They don't provide an office space in DC due to their security policy
DC-02	Decline	They don't provide an office space in DC due to their security policy
DC-03	Decline	They don't provide an office space in DC due to their security policy
DC-04	Decline	They don't provide an office space in DC due to their security policy
DC-05	Decline	They don't provide an office space in DC due to their security policy
DC-06	Decline	They don't provide an office space in DC due to their security policy
DC-07	Conditional acceptance	They don't provide an office space in DC due to their security policy but they are happy to have a discussion to meet with the customer needs
DC-08	Decline	They don't provide an office space in DC due to their security policy
DC-09	Decline	They don't provide an office space in DC due to their security policy
DC-10	Decline	They don't provide an office space in DC due to their security policy
DC-11	Decline	They don't provide an office space in DC due to their security policy
DC-12	Decline	They don't provide an office space in DC due to their security policy
DC-13	Decline	They don't provide an office space in DC due to their security policy
DC-14	Decline	They don't provide an office space in DC due to their security policy
DC-15	Decline	They don't provide an office space in DC due to their security policy
DC-16	Decline	They don't provide an office space in DC due to their security policy
DC-17	Decline	They don't provide an office space in DC due to their security policy
DC-18	Decline	They can meet with the customer needs but unfortunately there is no available space at all
DC-19	Decline	They don't provide an office space in DC due to their security policy
DC-20	Decline	They don't provide an office space in DC due to their security policy
DC-21	Accept	They can meet with the customer needs but unfortunately there is no available space in the Kansai region
DC-22	Decline	They don't provide an office space in DC due to their security policy
DC-23	Decline	They don't provide an office space in DC due to their security policy
DC-24	Decline	They don't provide an office space in DC due to their security policy
DC-25	Conditional acceptance	They can meet with the customer needs but unfortunately there is no available space until next year
DC-26	Conditional acceptance	They don't provide an office space in DC due to their security policy however they can offer an office space in the next building (no generator backup) of DC
DC-27	Decline	They don't provide an office space in DC due to their security policy
DC-28	Decline	They don't provide an office space in DC due to their security policy
DC-29	Accept	They can meet with the customer needs and have a few available rooms in the Kansai region
DC-30	No replay	NA
DC-31	Decline	They don't provide an office space in DC due to their security policy
DC-32	Decline	They don't provide an office space in DC due to their security policy

6.4 Market research: A high resiliency office

The Roppongi Hills has 6 sets of 6.4MW (Mega watt) gas turbines in the power plant. It has the 1st and the 2nd backup, runs 24x7 and has 400,000 liters of fuel stored. During the period of the power supply restrictions done by TEPCO after the Tohoku Pacific Earthquake, the Roppongi Hills' power plant kept providing electricity to TEPCO to minimize the demand-supply gap.



<http://www.mori.co.jp/en/>

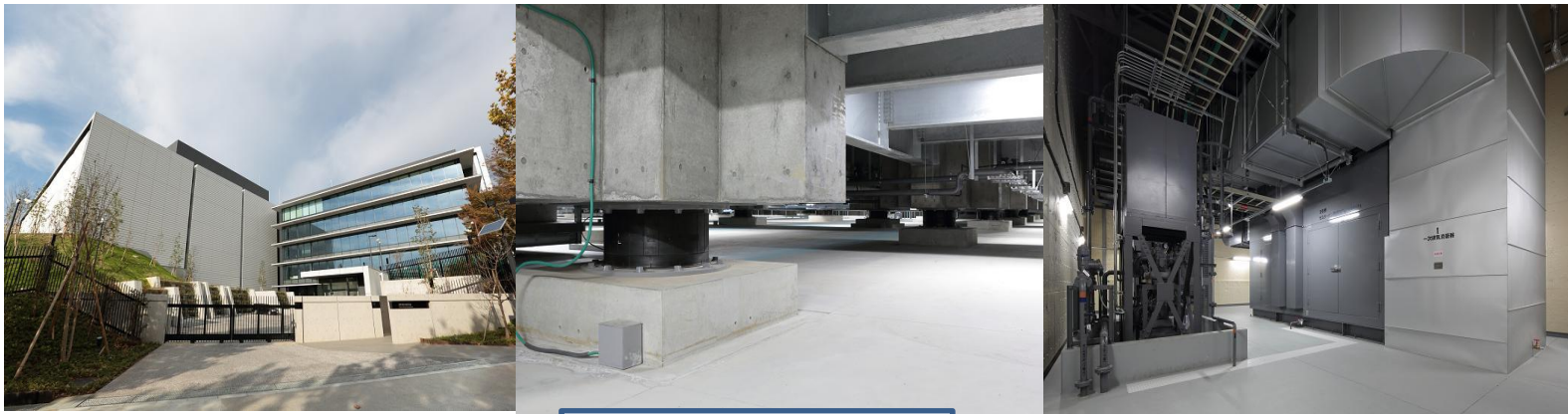
7.1 Potential Solutions

<Potential Solution 1: Combined solution for the DC and the backup office>

It is important for banks to have a backup office in the building that has an <N+1> or <N> spec power generator as well as being in an earthquake resilient building.

About 8 years ago, Barclays successfully agreed with the DC vendor to have a combined solution with the DC and the in-DC backup office to accommodate more than a hundred recovery desks for the critical operations. This In-DC backup office is located in the DC spec building that has an earthquake isolation mechanism, <N+1> spec power generator systems, multiple backup with telecommunications, cooling systems, and plenty of stocks of water and fuel. This In-DC backup office and the backup DC are also located side by side to reduce latency in the event of an emergency. Therefore contracting the DC and the backup office into one might be an ideal solution.

Barclays' idea is implemented in the new DC that has been built recently in the suburb of Tokyo. In this DC, a DC and an office building are built side by side and share critical infrastructures such as power generators etc. This proposal is in progress in the market.



<http://www.nri.co.jp/>

7.2 Potential Solutions

< Potential Solution 2: Renovating the old DC of the mega bank >

In the last decade, a number of mergers happened in the banking market resulting in the establishment of 3 mega bank groups. After those mergers, many old DCs are left unused simply because the companies no longer need them.

As those ex-DCs still have excellent resiliency, and have power generators and telecommunications systems, etc., Renovating them to accommodate the backup offices for local banks that don't have the necessary resources to complete the social responsibilities of banks would be a potential solution. This solution might be a good business model for the mega banks to make best use of the unused premises and facilities. This proposal is also in progress in the market.



Mizuho ex-Datacenter

Built : 1974

Floor capacity : 42,438m²

11 floors with the computer rooms

N+1 power generator

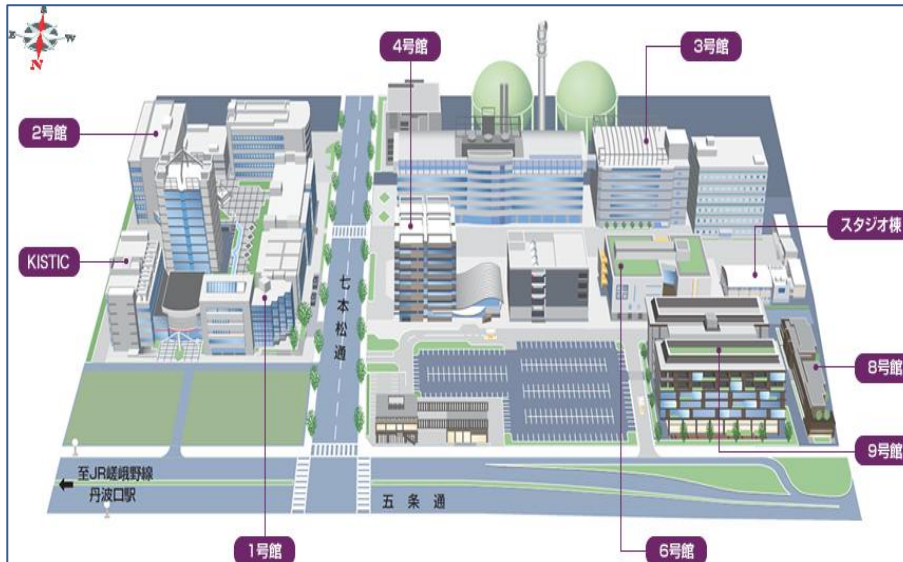
<http://www.mizuho-fg.co.jp/index.html>

7.3 Potential Solutions

< Potential Solution 3: The activation of co-generator solutions >

Another candidate for an In-DC backup office in Japan is located in a sub-building with the backup control center of Osaka GAS, which also has co-generators in it. This solution is already in the market, and seems to be a best fit with business needs. However, co-generator power supply doesn't cover the office space.

As most of the core infrastructure is already in place, extending power distribution cables to the office space to expand coverage might be a feasible solution.



<http://www.osakagas.co.jp/index.html>

7.4 Potential Solutions

< Potential Solution 4: A zone based service continuity plan for ATMs >

The idea of “a zone based service continuity” is based on the service level not by each company but by each zone, and deciding which facilities such as ATMs should be continued or suspended. Considering the difficulty of public transportation after a disaster, service continuity should be managed every 500m radial circle so that services are available every 1km, which is within walking distance for most people. Banks don't need to continue all ATM services but should selectively run ATMs to maintain their service continuity as part of the zone by zone plan.

Other infrastructure such as mobile phone antennas and traffic lights also need a zone based service continuity plan. Thus essential infrastructures like a power generator can be shared between service providers. This solution requires cooperation, co-working and an alliance among the different companies across different industries. However such coordination supports a local community in the event of a disaster.

This idea might be used when we design the Smart city, especially about its backup plans.



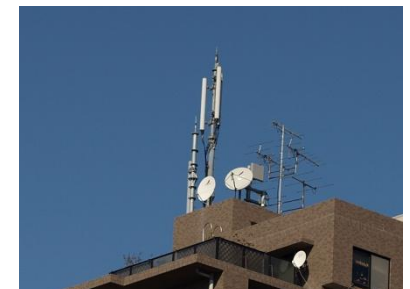
<http://www.mizuho-fg.co.jp/index.html>



<http://www.keishicho.metro.tokyo.jp/>



<http://www.kinen.jp/>



<http://www.nttdocomo.co.jp/>

8. Conclusion

The electricity is the very essential recourse with the ICT and the business in all industry. But until we lose it, we never imagine how big impact we have when the blackout happens. What happened in Tokyo will be potentially happened in any location in the world. It may be caused by the system/facility failures or human errors, terrorist attacks in the power plant if you don't even have a chance with the earthquake. Thus it is important for us to have the plan B and plan C when we design the smart city.

As discussed the banks also have huge dependencies on electricity. Thus the specs of the premises need to be able to meet these requirements. In order to fulfill the social responsibility that is required by the BOJ and to meet with the business recovery needs such as RTO, an $<N+1>$ or $<N>$ spec power generator is necessary not only for the main office and the DC but also for the backup offices.

Checking with the top 27 office buildings in Kansai and found that only 3.7% (1 office in 27) has a power generator to support tenants. Also, among the top 32 SI and DC vendors in Kansai, 81.3% (26 in 32) declined DC space for office use due to the security reason.

3 potential solutions discussed in this paper in order to mitigate risks are as follows;

- A) Contracting the DC and the backup office into one.
- B) Renovating unused mega bank DCs to support small-medium and Local banks.
- C) Enhancing to activate (the activation of) co-generator solutions

Another proposal is for services continuity to fulfill the social responsibility with banks.

- D) Zone based service continuity plans with ATMs to create an alliance and co-work to support the local community. This idea might be used when we design the Smart city, especially about its backup plans.