

# Japan Faces Challenges of Earthquake, Tsunami and Nuclear Disaster

June 2011

Japan entered 2011 with a bold determination to confront a wide range of economic challenges. This included installing a new Industrial Structure Vision, promoting stronger East Asian integration, reforming the agricultural sector, and potentially entering into talks concerning the Trans-Pacific Strategic Partnership.

Dynamics within Japan, however, shifted abruptly on March 11<sup>th</sup>, when the nation was hit by a massive earthquake and 30-foot tsunami. The resulting natural disaster caused severe damage, including a partial meltdown at the Fukushima Daiichi Nuclear Power Station, which has yet to be secured.

Some observers believe this shock will ultimately transform Japanese society - making what had been politically and socially impossible – both necessary and essential. The Japanese people have a long tradition of emerging stronger from adversity, and it is indeed plausible to imagine the crisis will create an impetus in which old demands are abandoned and vested interests overcome to create a new consensus that results in a more open and competitive economy.

Japan is still in the midst of resolving this disaster, and it will take time to fully identify, address and comprehend the full consequences. Major power, infrastructure, and supply-chain destruction, as well as continued aftershock earthquakes have disrupted Japan while also impacting the global economy.

## IN THIS ISSUE:

- **Japan Faces Challenges of Earthquake, Tsunami and Nuclear Disaster**

- **Japan was Intent on Realizing Prime Minister Kan's Vision**

- **Earthquake, Tsunami and Nuclear Crisis Proves Most Destructive Event Since World War II**

- **Japan Faces Many Obstacles as it Evaluates Damage and Initiates Reconstruction Process**

- **Crisis Provides Unprecedented Opportunity to Transform Japanese Economy and Society**

- **And More!**

Understanding the full extent and implications of this tragedy will not only help Japan overcome this disaster, but also provide for more informed decisions regarding the opportunities and challenges resulting from its reconstruction.

## Japan was Intent on Realizing Prime Minister Kan's Vision

Prime Minister Naoto Kan entered 2011 preparing to lead Japan along a bold, new economic path. Confronted by an aging population, stagnating economy, and a high government debt to Gross Domestic Product (GDP) ratio, Kan recognized **Japan's** challenges and was intent on implementing a multi-faceted approach to reforming and strengthening its economy.

Figure 3. General Government Debts and Deficits, 2010

	% of 2010 GDP				
	Gross Debt	Net Debt	Budget Balance	Structural Balance*	Cyclically Adjusted Primary Balance*
Belgium	100	91	-4.8	-3.4	0.2
France	84	74	-8.0	-5.0	-4.1
Germany	75	59	-4.5	-3.1	-1.0
Greece	130	110	-7.9	-7.4	-1.5
Ireland	94	55	-17.7	-8.6	-6.1
Italy	118	99	-5.1	-3.6	0.7
Japan	226	121	-9.6	-7.6	-6.2
Portugal	83	79	-7.3	-6.1	-3.0
Spain	63	54	-9.3	-7.5	-5.7
United Kingdom	77	69	-10.2	-7.9	-5.4
United States	93	66	-11.1	-8.0	-6.5
Hungary	78	71	-4.2	-1.1	2.4

\* % of Potential GDP. All numbers refer to the general government. Budget Balance = General government net lending/borrowing. Sources: IMF Fiscal Monitor November 2010 for Cyclically Adjusted Primary Balance for all countries and Structural Balance for Hungary, IMF WEO October 2010 for all other data.

Prime Minister Kan and his Democratic Party of Japan (DPJ) planned to initiate major structural reforms, including those delineated in the Ministry of Economy, Trade and Industry's (METI) [Industrial Structure Vision 2010](#). The Industrial Structure Vision aimed to diversify **Japan's** economy, better capitalize on technological developments, and fix weaknesses in business infrastructure such as high corporate tax rates and deteriorating seaport facilities.

Central to **Kan's** vision was the need to create an "open Japan" that would be more welcoming to bilateral, regional, and international trade agreements. Embracing the momentum created by **Japan's** success hosting the 2009 Asia Pacific Economic Cooperation (APEC) Leaders Summit in Yokohama, Kan asserted his intention to consider entry into talks to join the Trans-Pacific Strategic Economic Partnership Agreement (TPP).

Joining the TPP was intended to introduce greater competition in **Japan's** domestic economy, while boosting its capacity to better penetrate Emerging Asian markets, which are rapidly becoming more important drivers of global growth and demand.

Entry into any trade agreement comes with electoral and political risks. In **Japan's** case, its agricultural industry has long been sheltered by protectionist trade policies. Agricultural advocacy groups strongly oppose entry into any trade agreement that reduces or eliminates tariffs. The agricultural industry has substantial influence, even among **Kan's** own DPJ. This is due to its electoral clout as well as support from Japanese people who want to protect traditional farm communities, the environment, and have concerns over food security.

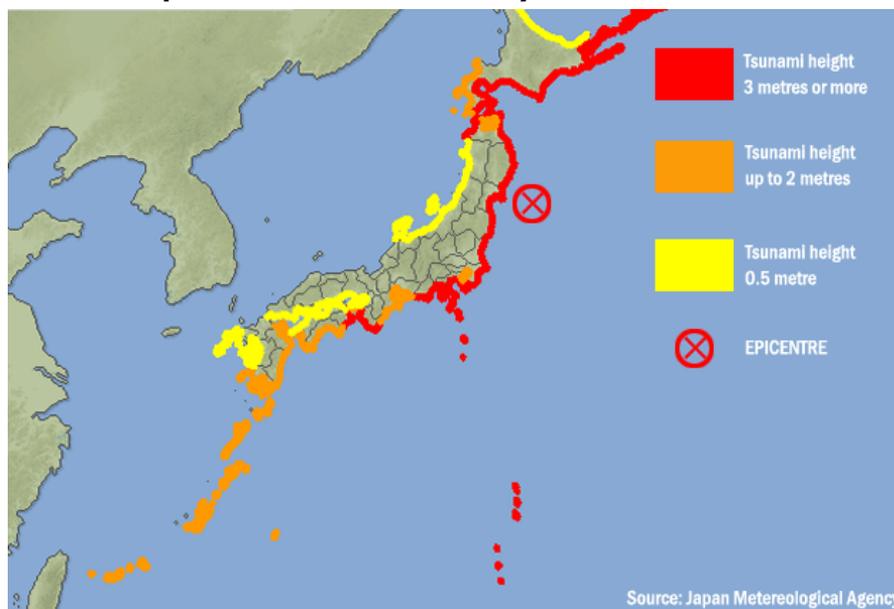
Despite the difficulty, Kan was determined to proceed irrespective of the political consequences. He vowed to enact agricultural reform and actively pursue economic partnership agreements even though many analysts were uncertain whether Kan had the political capital to enact such overarching reforms. The Economist [addressed](#) the challenge to passing "the boldest reforms in **decades,**" suggesting if Kan encounters political opposition from farmers and the rural heartland, he should "go over their heads and appeal to urban voters." At best however, the path forward was not going to be easy and one analyst described early achievements as "the second inning of a first World Series **competition**".

On March 11, however, a severe earthquake, tsunami, and subsequent nuclear emergency shocked Japan. This caused an immediate need to shift the attention of government and corporate leaders from these longer-term but essential priorities to immediate disaster relief.

## Earthquake, Tsunami and Nuclear Crisis Proves Most Destructive Event Since World War II

Just before 3:00 pm local time on March 11<sup>th</sup>, a massive undersea earthquake with a magnitude of 9.0 on the Richter scale struck Japan's northeastern coast, 400 kilometers from Tokyo. The earthquake generated a massive tsunami that crashed into Japan's eastern coastline, causing severe flooding, damage to buildings, boats and cars, and a multitude of human casualties. More than 50 aftershocks followed throughout the day, many exceeding a magnitude of 7.0. As [noted](#) by Tokyo University Professor Naoto Sekimura nuclear fuel at the stricken Fukushima Daiichi power plant began melting just five hours after the initial earthquake. Tokyo Electric Power Company (TEPCO) has also now [confirmed](#) that fuel pellets "melted, falling to the bottom of the reactor pressure vessel at a relatively early stage after the tsunami reached the station" as well as additional [details](#) concerning the state of the nuclear power station at the time of the earthquake.

### Epicenter and Areas hit by Tsunami Wave



On March 12<sup>th</sup>, Japanese authorities announced that four nuclear power stations in quake-hit areas had been shut down. A "state of emergency" was declared at Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station after the disaster caused cooling

systems to fail at its Number 1 reactor. More than 3,000 residents living within 6.2 miles of the plant were evacuated. An explosion at the Fukushima plant raised fears of a meltdown. Japanese authorities mobilized over 100 thousand military and civilian rescue personnel to begin rescue and relief efforts. More than one million households were without water, and four million buildings without power.

On March 13, **Japan's** nuclear safety agency announced the cooling system of a third nuclear reactor at Fukushima failed, as nuclear plant operators relentlessly fought to cool the damaged reactors to prevent a nuclear catastrophe. **Japan's** government reported that 230 thousand people had been evacuated from areas within a twelve-mile radius around the damaged Fukushima nuclear reactors. Prime Minister Kan addressed the nation and urged the Japanese people to unite and face "the most severe crisis in the past 65 years since World War II."



Source: AFP

Japan continues to struggle with this humanitarian and nuclear emergency, as they maintain rescue and cleanup efforts and additional information becomes known. Traces of radiation have been found in the air and in water pouring from the reactors into the ocean. Japanese officials have also encouraged a voluntary evacuation from up to 19 miles outside the Fukushima plant. On April 12<sup>th</sup>, Japan raised its assessment of the accident from 5 to the most severe 7 rating -- placing the accident at the same level as the 1986 Chernobyl meltdown.

According to the National Police Agency of Japan on May 26<sup>th</sup>, the official death toll is 15,234 with 8,616 people listed as missing. Entire towns have been destroyed, and more than 130,000 placed in temporary shelters. The Japanese government [has estimated](#) total damages could total 25 trillion yen.

### *Black Swans and Nuclear Energy*

Many analysts have labeled the crisis a "black swan" event. Coined by Nassim Nicholas Taleb, a black swan is defined as an event that is "outside the realm of regular expectations, because nothing in the past can convincingly point to its possibility." The other two fundamental qualities of a Black Swan are that its impact is extreme, and seems predictable only after the fact.

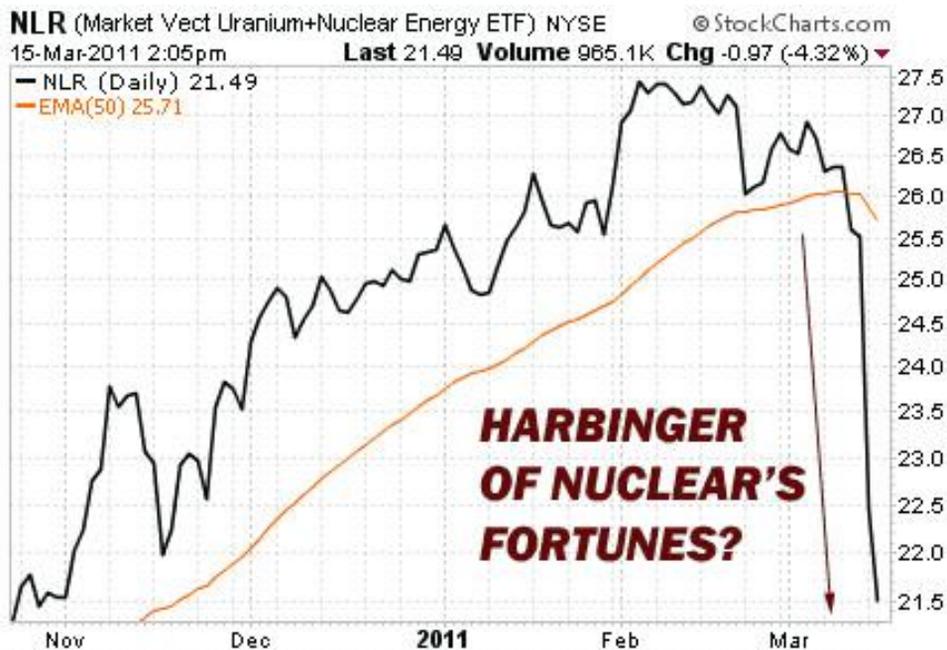
Earthquakes and tsunamis in Japan are predictable events. Far more exceptional was the strength of the earthquake, the fifth strongest seen anywhere in the last hundred years and the largest ever recorded in Japan. The Fukushima nuclear plant includes six General Electric reactors built between 1971 and 1979. The cooling systems in the reactors were built to withstand an earthquake of up to 7.9 magnitude, a tsunami, or a blackout.

Some have criticized Japan's regulators, politicians, and engineers for failing to adequately predict the crisis and secure the nuclear power plant. Basing its preparations off historical data, Tokyo Electric engineers and seismologists believed 7.9 was the highest magnitude of earthquake that would occur near the nuclear plants. The designers of Fukushima had not

planned to cope with the strongest earthquake ever recorded in Japan – combined with a simultaneous tsunami and blackout. It is only through hindsight that failure to predict these unprecedented events warrants rebuke.

Just as the nuclear emergencies at Chernobyl and 3 Mile Island led to a review of nuclear policy, Japan's emergency has prompted a reexamination of its use, at a time when many were preparing for a nuclear "renaissance" given the ability of nuclear fuel to decrease global dependence on hydrocarbons and lower emission outputs. In fact, on May 10th, Prime Minister Kan announced that Japan is abandoning its plans to build fourteen new nuclear reactors by 2030. Additionally, Chancellor Angela Merkel of Germany temporarily closed seven nuclear plants built before 1980. In China, Premier Wen Jibaou passed an order for a full review of nuclear power plants under construction and Japan itself recently [moved](#) to temporarily shut down Chubu Electric's Hamaoka plant until security against similar disasters can be improved.

### Market Vectors Nuclear Energy following Japan's Earthquake



Interestingly, however, despite sensationalized media reports, massive sell-offs in nuclear-related securities, fears about radiation and legitimate concerns over nuclear safety, world leaders appear to recognize the world cannot afford another breakdown in nuclear plant and technology development such as that which occurred after Chernobyl and 3 Mile Island. Ironically, the problem we face today appears to more one of antiquated facilities -- which have been kept in service at least partially due to the lack of new development and activity in the sector following these prior crises -- than nuclear technology itself.

US Energy Secretary Chu stressed the importance of new plant development in [comments to reporters following Japan's disaster](#). His concern was then reinforced in comments by President Obama in Pittsburgh in which the President noted all energy sources have downside risks. Obama explained nuclear accounts for 20% of US electricity capacity and we need "...to make sure that we take lessons learned from what's happening in Japan and that we are constantly upgrading how we approach our nuclear safety in this country."

Even in Japan, which has been directly devastated by this crisis, there is a realization that nuclear will remain a component of energy procurement in this resource-poor nation. This conclusion was noted in a statement by one Japanese official, quoted in an Associated Press [report](#) titled "Japan won't abandon nuclear power despite crisis." While existing nuclear power plants will continue to operate and nuclear energy will remain a critical energy source, Prime Minister Kan has vowed to refocus Japan's energy policy on renewable energy and conservation.

## **Japan Faces Many Obstacles as it Evaluates Damage and Initiates Reconstruction Process**

In the wake of Japan's worst-recorded earthquake, tsunami, and a nuclear emergency, the Japanese people and government face a massive reconstruction effort. At this point, tireless relief efforts have focused on immediate concerns- rescue and search operations, evacuations, humanitarian aid, restoration of water delivery, and efforts to stabilize the Fukushima Daiichi nuclear reactors.

The Japanese government earmarked \$48.5 billion in emergency spending, as a first step to the largest reconstruction effort since World War II. While substantial efforts are underway, the tragedy is still unfolding, aftershock earthquakes continue, the damaged reactors are still being contained, and the long-term consequences are not fully known. Nevertheless, on May 17<sup>th</sup>, **Japan's cabinet adopted "[The Guideline on Policy Promotion](#)" presenting policies to revitalize Japan.** These are necessary both to underpin reconstruction following the earthquake as well as to address long-term economic challenges. Additionally, the review of **Japan's [New Growth Strategy](#)** will be completed this summer and concrete measures to allow implementation will be presented this year, giving further depth to Japanese efforts to reform its economy.

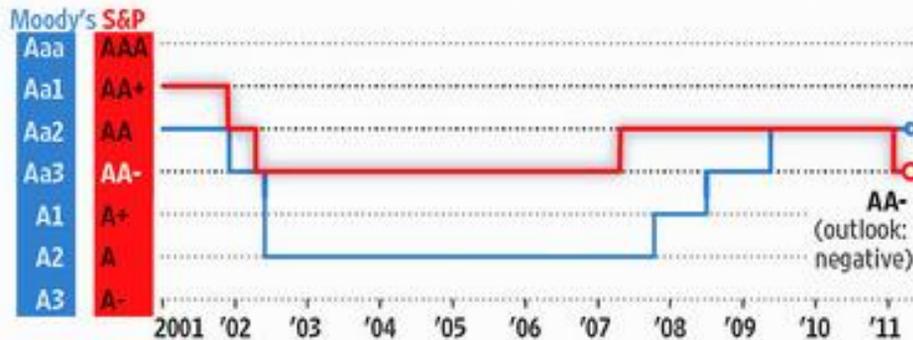
Qualities of the Japanese people- solidarity, stoicism, and resilience- observed in the immediate aftermath of the disaster will aid the nation in reconstruction efforts. While in **Japan, Hagit Limor, an investigative reporter from Ohio, witnessed Japanese people "carry forth with such dignity and quiet determination in so dire a time proved the depth of character to which these traits are ingrained in the Japanese psyche."**

Collective resilience is essential if Japan is to rebuild a nation with a promising future. While this dichotomy may be simplistic, analysts have suggested reconstruction could lead Japan along one of two paths -- a nation built with a stronger foundation or the upsetting alternative that it may never fully recover.

**There are reasons to be pessimistic about Japan's ability to recover from this tragedy. Economist Hugh Edward worries Japan's debt burden will harm long-term recovery. He [says](#), "Japan is very unlikely to have a 'New Deal-like' economic recovery, for the simple reason it cannot really afford to have one due to the pressing need to get the debt dynamics better under control." Edward believes there are no easy solutions, noting "The underlying problem in Japan is not lack of technical ingenuity, nor is it a shortage of credit; Japan's fundamental problem is a demographic one," and its aging population will be a significant obstacle to long-term recovery. Indeed, on April 27, Standard & Poor's (S&P) Ratings Services downgraded its long-term rating on Japan from stable to negative.**

## Downgraded Outlook

Japan's long-term sovereign-debt ratings by Standard & Poor's and by Moody's



Sources: Standard & Poor's; Moody's

S&P's outlook reaffirms the beliefs of analysts who doubt Japan can reign in their budget deficit. It also questions the ability of Japan's political leaders to come to a consensus on economic planning. Agost Bernard, a S&P analyst, [said](#), "The political backdrop... remains uncondusive to major fiscal and structural reforms."

Prior to the earthquake, Prime Minister Kan's approval ratings hovered around 20 percent. The disaster strengthened his approval ratings and created a tenuous political truce between the DPJ and Liberal Democratic Party (LDP), as the political parties cooperated to address the crisis. This truce, however, may be short-lived and Prime Minister Kan has been criticized for his handling of relief efforts and inability to tame nuclear reactors at Fukushima. Sadakazu Tanigaki, president of the LDP, for example has stated, "I think time has come for the prime minister to consider his resignation." Prime Minister Kan, however, has refused, vowing before parliament, "In addition to achieving a recovery from the disaster, I want to pave the way for fiscal reconstruction."

Despite the difficulties this should be seen as a positive sign as it indicates the Prime Minister is not indulging in the temptation to turn inward -- but rather to maintain the economic reform that is essential to achieve a sustainable recovery.

### ***Recovery will Depend on Repair of Energy Infrastructure***

Finally, Japan's energy infrastructure may be problematic to its recovery efforts. TEPCO lost one quarter of its supply capacity as a result of the earthquake and tsunami. In addition to voluntary measures to encourage greater energy efficiency, METI has [announced](#) compulsory power restrictions, with an emphasis on large corporate users. This may harm productivity and raise their costs. The Japan Times reports, "The government believes rolling blackouts would exact too severe a toll on people in the intense summer heat, while power rationing would also hurt the economy." Japan's oil and gas demand is also rising at a time when international oil prices are near their highest price since 2008.

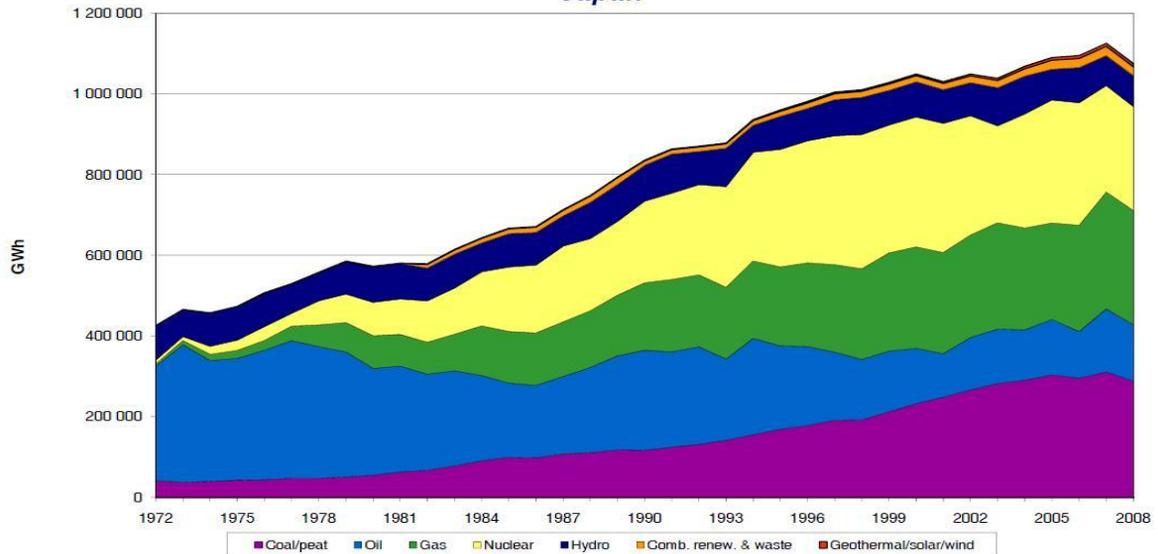
*The Economist* [reports](#) Japan will face painful choices defining their long-term energy policy. Nuclear energy provides approximately 30% of electrical capacity and was intended to increase its share of electricity supply to 50% as a central component of the DPJ's plan to reduce carbon emissions by 15 percent in the next ten years. Prime Minister Kan has announced they will seek to pursue renewable energy and conservation to reduce Japan's carbon emissions.

Japan lacks natural resources and local energy alternatives, so to abandon nuclear energy would force Japan to significantly increase imports of coal, gas, and oil. Doing so would prevent Japan from achieving its target reduction in carbon emissions, and likely escalate trade imbalances. As a result, at least in the short term Japan does not have the option to curb its existing use of nuclear power. Over time, however, it can diversify by strengthening its emphasis on the development of new renewable energy technology and sources.

IEA Energy Statistics

Statistics on the Web: <http://www.iea.org/statist/index.htm>

### Electricity generation by fuel Japan



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For more detailed data, please consult our on-line data service at <http://data.iea.org>.

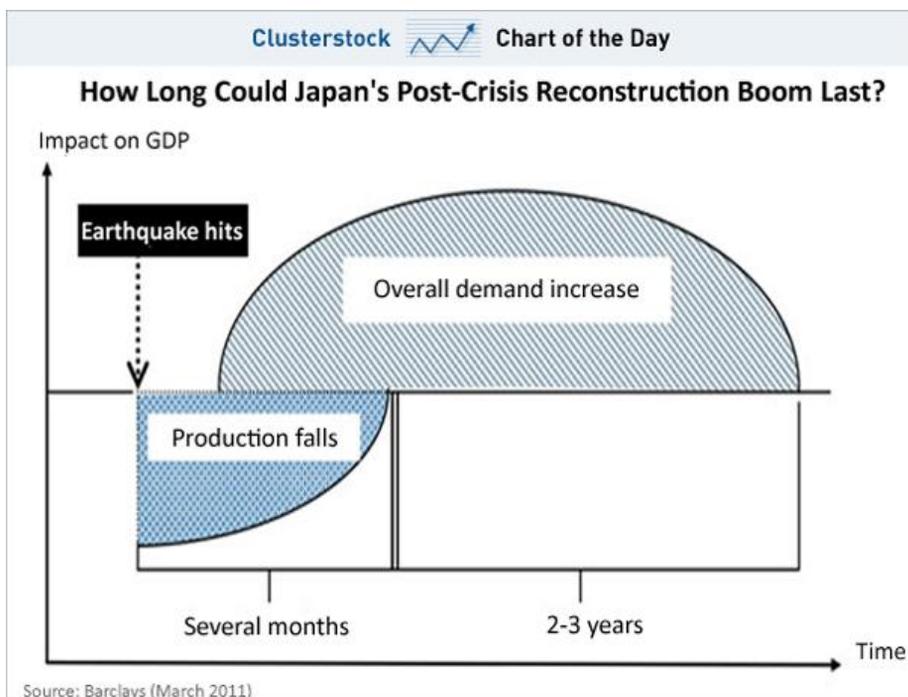
Indeed, early in the crisis, Reuters reported comments by Chief Cabinet Secretary Yukio Edano who noted while it is important to examine Japan's reliance on nuclear once the full implications were known "renewable energy will play an important part in Japan's reconstruction". Edano stated "When considering the damage from this accident, there is no doubt we are moving towards making renewable energy sources a pillar." Japan has been a leader in energy conservation, but has not fully committed itself to the utilization of alternative energy sources like solar and wind power.

On a positive note, Patrick Cronin, senior director of the Asia-Pacific Security Program at the Center for a New American Security, believes Japan can come away from this crisis as a global leader in nuclear energy safety by developing a model system for regulating and reducing the danger of civil nuclear programs. In agreement, Prime Minister Kan stated, "We need to make nuclear energy safer."

## Crisis Provides Unprecedented Opportunity to Transform Japanese Economy and Society

In 2008, Rahm Emanuel, former chief of staff for President Barack Obama, stated to the Wall Street Journal, "You never want a serious crisis to go to waste...it is an opportunity to do things you think you could not do before." On face, this sentiment may seem cynical. Often in democratic systems major reforms, no matter how necessary, are difficult to pass due to special interest groups and varied electoral considerations. However, a crisis unites nations around a common goal - recovery- and provides an opportunity to reset effort and debate on major policy reforms.

Before the crisis, Japan's GDP had been stagnating for almost two decades. Many economists believe over the next few months, Japan's economy will continue to struggle as it deals with the immediate impact of the crisis. In the next few years, however, some economists predict Japan's GDP will grow because of reconstruction. Will Grimes, professor at Boston University, noted, "Even though you have a big net loss of wealth, the reconstruction adds new economic activity in the form of jobs and all sorts of goods."



The crisis also illustrates how essential Japan is to the global supply-chain, especially in automotive, electric, and computer industries. Mark Humphlett, director of ERP solution marketing for Infor, commented, "A lot of those (products with supply shortages) are single-source components that you can't get anywhere else." Toyota plants in North America have temporarily shut down because of parts shortages, and economists warn of possible shortages of memory chips, LCD glass, and other electronic hardware.

While the effect of this crisis on the global supply chain demonstrates Japan's crucial role in the global economy, it also presents a significant challenge for Japanese firms to quickly restart manufacturing, lest foreign competitors try to supplant their competitive position. Fortunately, according to a METI survey, 60% of companies directly affected by the crisis have already finished restoring the efficiency of their supply chains with the rest on their way toward resumption.

The behavior of the Japanese people immediately following the tragedy offers hope their solidarity will continue as reconstruction begins. Foreign journalists admirably [noted](#) the lack of looting and crime and collectivist efforts to provide relief to one another. *The Los Angeles Times* [reports](#) Japan has emerged from crises stronger, "as it did after the great 1923 earthquake and the devastation of World War II." Other publications described rapid movement to commence reconstruction such as one [article](#) titled "Japanese Engineers Unbelievably Repair Earthquake Ravaged Road in 6 Days".



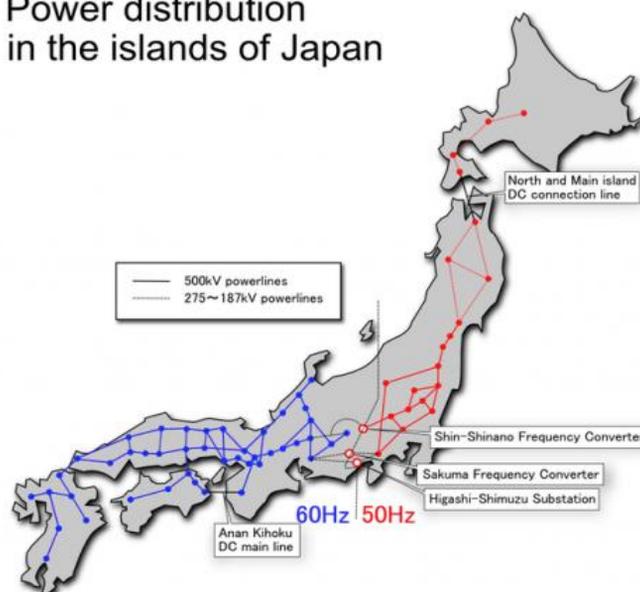
Image compiled from AP photographs

Akira Wada, a professor at the Tokyo Institute of Technology, framed the crisis as a chance “to change our thinking, our civilization.” Reconstruction will aim immediately to subdue the Fukushima reactors, restore roads, and rebuild homes, but it also provides an opportunity to create a new path that can bring economic growth to Japan in coming decades.

Brian Klein and David Abraham, international affairs fellows at the Counsel on Foreign Relations, [recommend](#) four policy areas that Japan’s government should address to enable long-term economic growth during reconstruction. First, they argue for multi-faceted changes to energy policy including harmonized electric grids and distribution networks, stronger building codes to increase energy conservation, and energy efficient consumer appliances. Currently, Japanese power frequencies are different in the east and west. This forces utilities to inefficiently and expensively convert electricity to share power.

As mentioned, the nuclear emergency is also likely to accelerate greater Japanese investment in alternate energy sources, as well as energy efficiency and improved nuclear safety technologies. As discussed in the March 2009 [Focus newsletter](#), Japan lacks native fossil fuels, and this crisis may provide the impetus to focus national efforts on improving Japan’s ability to harvest energy from solar and wind. Investing in these areas will reduce Japan’s reliance on imported oil and gas and create new products and innovations for export.

### Power distribution in the islands of Japan



Source: Image from Wikipedia

Next, Klein and Abraham believe Japan should promote small and medium-sized enterprises **to create jobs and encourage innovation. In addition to providing loan guarantees, "The government should use the crisis to encourage both foreign and domestic private capital to smaller and medium-sized firms more broadly to reduce the sector's reliance on loans."** Klein and Abraham also suggest Japan should consider deemphasizing Tokyo as its economic center. **Tokyo contributes roughly a sixth of the country's GDP and is located in an area that could be directly hit by a catastrophic earthquake. They write, "Tokyo needs to spur decentralization efforts, providing local governments with greater fiscal autonomy...The private sector should be encouraged to follow its lead."**

Finally, Klein and Abraham argue now is the time to reform the agriculture and promote free trade. The nuclear crisis has created scientifically unfounded, but prevalent fears, about the safety of Japanese agriculture and fishing and over 25 countries have placed restrictions on food imports from Japan. Klein and Abraham recommend a multi-pronged approach to agricultural reform that reduces import barriers to lower the price of food, cut tariffs, and begin a public relations and food safety campaign to promote the safety of Japanese foodstuffs in foreign markets.

Reforming the agricultural sector would encourage greater efficiency, while removing major obstacles that inhibit Japan from entering economic partnership and trade deals. Detailed in the last [Focus newsletter](#), entry into trade agreements and enhanced regional integration would enable Japan to maintain its economic competitiveness, facilitate access to emerging markets, and provide opportunities for growth over the long term. According to Minister of State for Economic and Fiscal Policy [Kaoru Yosano](#), **Japan's government will have to decide by November whether they will enter talks to join the Trans Pacific Partnership.**

Japan faces immense challenges both in the short and long-term that should not be minimized. Nevertheless, Prime Minister Kan has promised to lead Japan through recovery and fiscal reconstruction. This is due to a recognition these goals are interrelated. Both are **essential to sustain Japan's economic viability. To accomplish this goal, he must reframe**

stalled policy debates and convince the Japanese public to support bold reforms that can strengthen the foundation of Japan's economy while simultaneously managing reconstruction efforts.

## Understanding is Essential to Evaluate Opportunities and Challenges

The March 11<sup>th</sup> earthquake, tsunami and resulting nuclear emergency has caused an **unprecedented crisis that will fundamentally alter Japan's course as a nation.** The tragedy is still unfolding, people are missing, and the Fukushima nuclear plant has yet to be secured. It will take months for the long-term implications and costs of the tragedy to be fully realized.

In the immediate aftermath of a massive earthquake, the global community witnessed the Japanese people calmly and heroically unite to help one another through the crisis. If Japan is to rebuild and reconstruct a stronger country, this unity and self-sacrifice must continue. At the same time, many people around the world expressed their sincere concern and have offered support during the crisis and for this the Japanese people are extremely thankful.

People often use the cliché that crisis equals danger plus opportunity. Despite the severity of the crisis, Japan has the opportunity to rebuild a nation with a sounder foundation and a more positive growth plan. Taizo Ishida, manager of Matthews Japan Fund, [states](#), **"I see a huge change in management and how they think about things... They have to grow, and so they need a new model, a new mindset. They're getting out of the more status-quo culture and into a new growth-oriented strategy."** Ishida advocates investing in Japanese companies that embrace this trend. Testuji Morino, board member of Dai Nippon Printing Company, noted, **"I think scholars are saying Japan is going down, but I think it's a chance for business."**

There is a hope this event will provoke not only Japan's private sector, but also its government to break from the status quo and reform its ailing economy while rebuilding its damaged infrastructure. Japan's government can use reconstruction to restore positive growth and build momentum for the economy. Japan's populace and political leaders have

significant challenges moving forward, but if they continue to demonstrate unity and resolve Japan can emerge from this crisis stronger than ever before.

For additional information on Japan's recovery from this crisis please go to [JETRO's website](#).

*Data, statistics and the reference materials presented within this newsletter have been compiled by JETRO from publicly-released media and research accounts. Although these statements are believed to be reliable, JETRO does not guarantee their accuracy, and any such information should be checked independently by the reader before they are used to make any business or investment decision.*

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