Economic Impact of the Great East Japan Earthquake and Current Status of Recovery

August, 2011

Government of Japan

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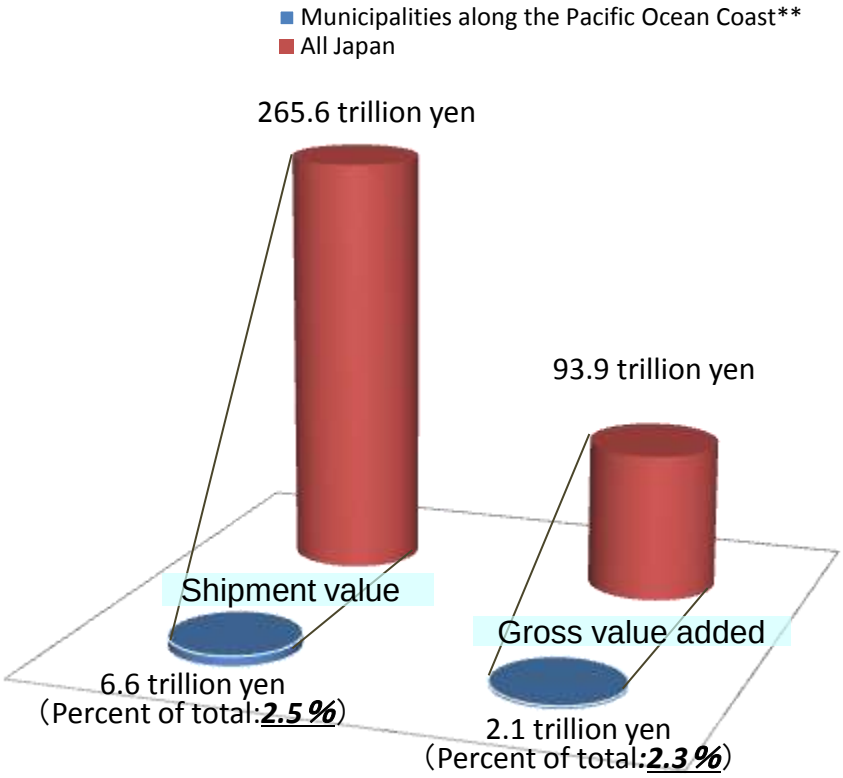
1. Extent of the affected areas

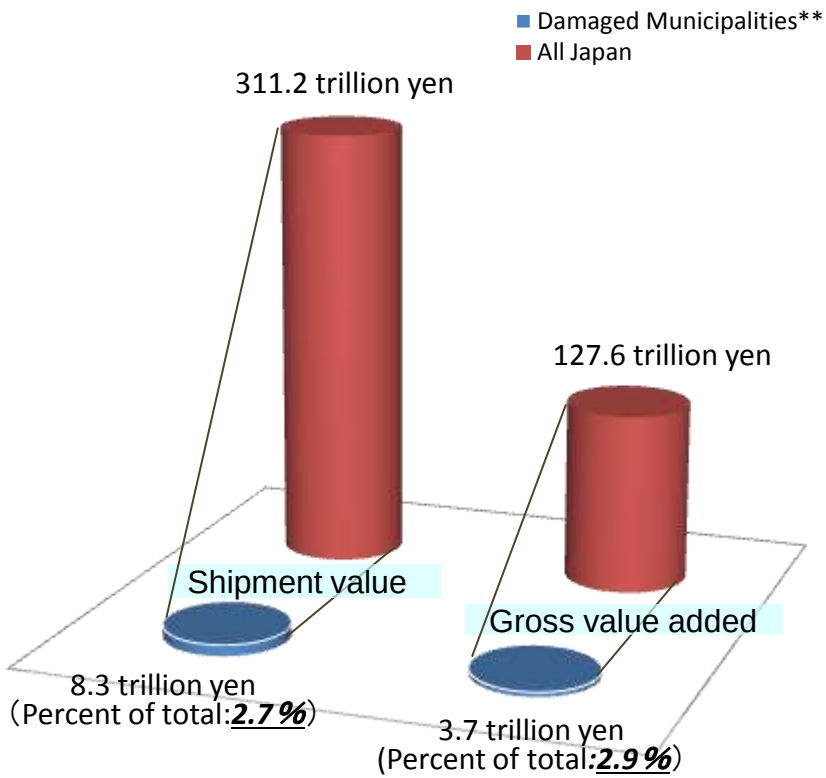
- Adverse impact to Japanese economy is limited since the pacific ocean coast ,which suffered the greatest damage, accounts for only 2.5 % of the total Japanese economy.
- The affected areas are slightly smaller in economic size than that of the Great Hanshin-Awaji Earthquake(1995).

The extent of economic activity in the municipalities along the pacific ocean coast * (Census of Manufactures)



【Source】
Census of Manufactures 2009 (Ministry of Economy, Trade & Industry)
* Survey of establishments with 4 or more employees
** Municipalities along the pacific ocean coast in Aomori, Iwate, Miyagi, Fukushima and Ibaragi prefectures

The extent of economic activity in the municipalities affected by the Great Hanshin-Awaji Earthquake*（Census of Manufactures）

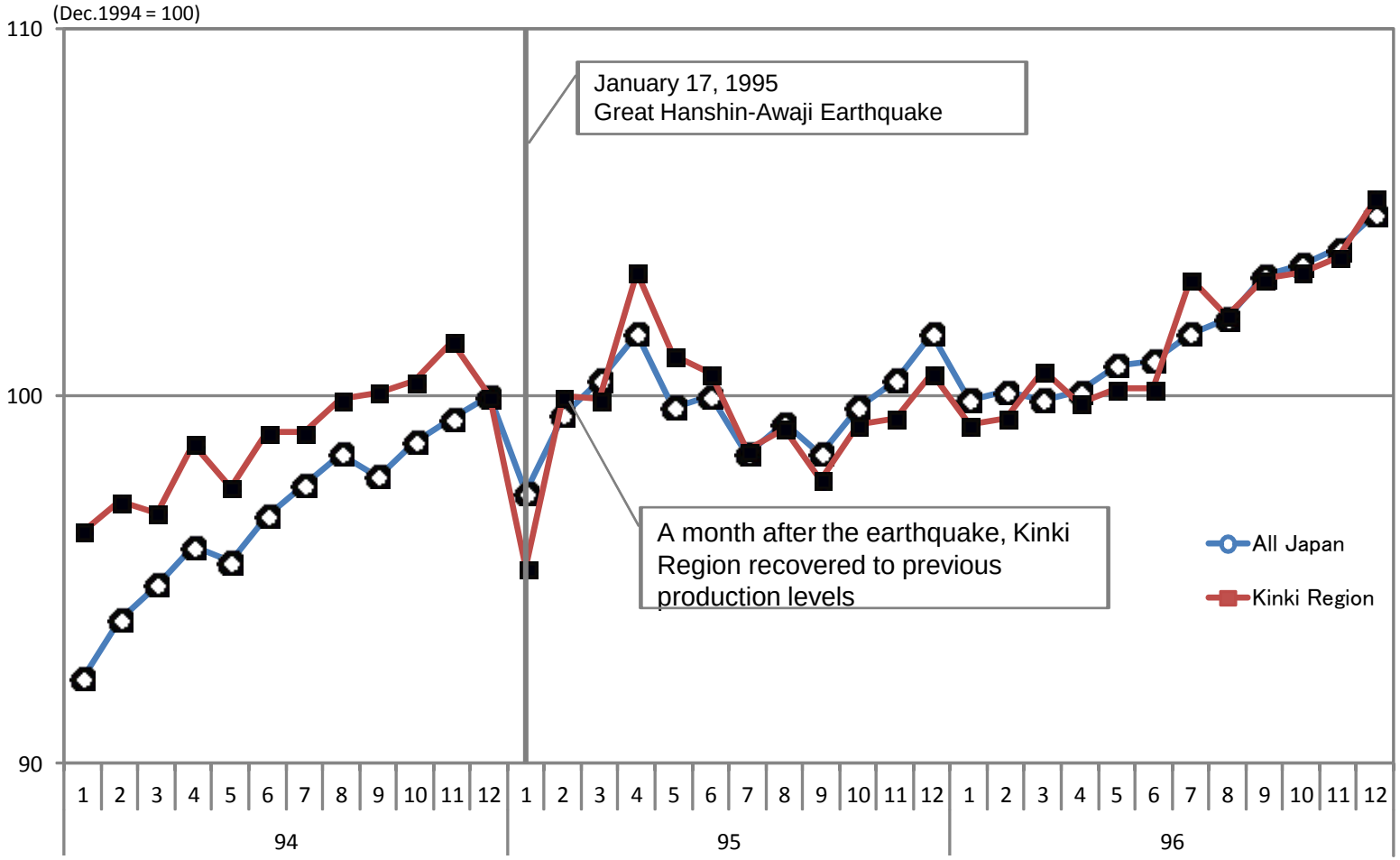


【Source】
Census of Manufactures 1993 (Ministry of Economy, Trade & Industry)
* Survey of establishments with 4 or more employees
** 10 cities and 10 towns which Disaster Relief Act was applied to in Hyogo-Prefecture.

2. Reconstruction and recovery following the Hanshin-Awaji Earthquake

➢Negative effects in the quake-hit area as well as nationwide were temporary with production levels showing a sharp recovery after dropping in the aftermath of the Great Hanshin-Awaji Earthquake.

Mining and manufacturing production before and after the Great Hanshin-Awaji Earthquake



【Source】Indices of Industrial Production (Ministry of Economy, Trade & Industry)
Changes in Industrial Production (Kinki, Ministry of Economy, Trade & Industry)

3. Reconstruction and recovery following the recent earthquake : (1)Tohoku Expressway

- The Tohoku Expressway is a transport and commercial artery which connects Tohoku and Kanto regions. Numerous factories are located along the route.
- 347 km out of 675 km of the expressway was damaged in the earthquake on March 11, but traffic restriction was lifted on March 24th, following the completion of emergency restoration measures.

Tohoku Expressway

NEXCO East

Mar 12th

NEXCO East

Mar 17th

NEXCO East

Mar 12th

NEXCO East

Mar 21th

3. Reconstruction and recovery following the recent earthquake : (2) Railroads

- None of the 26 trains operating at the time of the earthquake derailed, nor was there any serious damage to elevated bridges and stations, or collapse of tunnels.
- The entire Tohoku Shinkansen resumed operation on April 29th.

Present status of operations as of April 29th

Morioka to Shin Aomori
Resumed operation April 13th

Ichinoseki to Morioka
Resumed operation April 23th

Sendai to Ichinoseki
Resumed operation April 29th

Fukushima to Sendai
Resumed operation April 25th

Nasushiobara to Fukushima
Resumed operation April 12th

JR East

3. Reconstruction and recovery following the recent earthquake : (3) Airports

- The reconstruction of Sendai Airport which was badly damaged by the tsunami showed surprisingly rapid progress thanks to the cooperation between the US Armed Forces and Japanese Self-Defense Forces. The entire runway was restored and became useable by March 28th.
- Passenger flights from Haneda-Sendai and Osaka(Itami)-Miyagi resumed operation on April 13th, a month after the earthquake.

KYODO NEWS

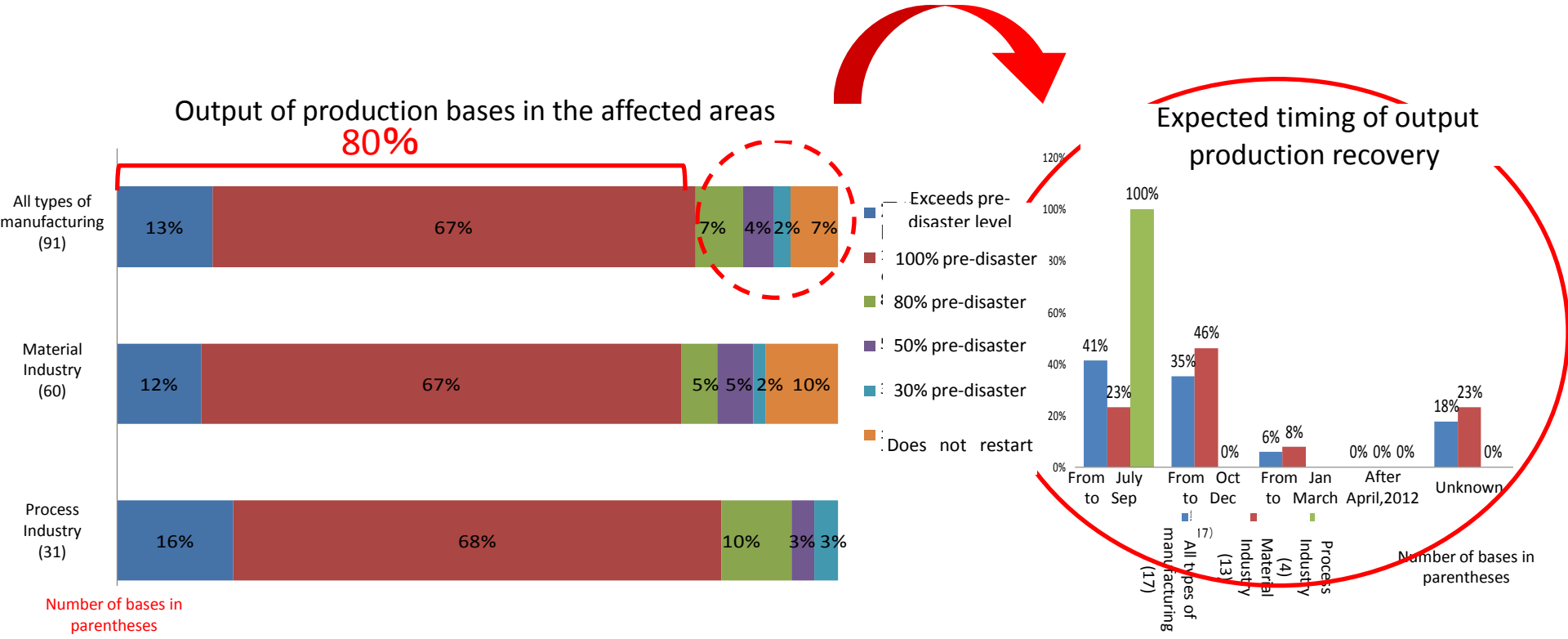
Sendai airport damaged by the tsunami as of March 13th.

KYODO NEWS

The first landing at Sendai airport since the earthquake on April 13th.

4. Current status of supply chains
(1) Output of production bases in the affected areas

○93% of 91 production bases directly affected by the disaster have already finished restoration.
○80% of 91 production bases have recovered output of production bases to pre-disaster, or exceeded former levels.
○More than 70% of production bases at which output is less than pre-disaster levels will have recovered their output by the end of 2011.

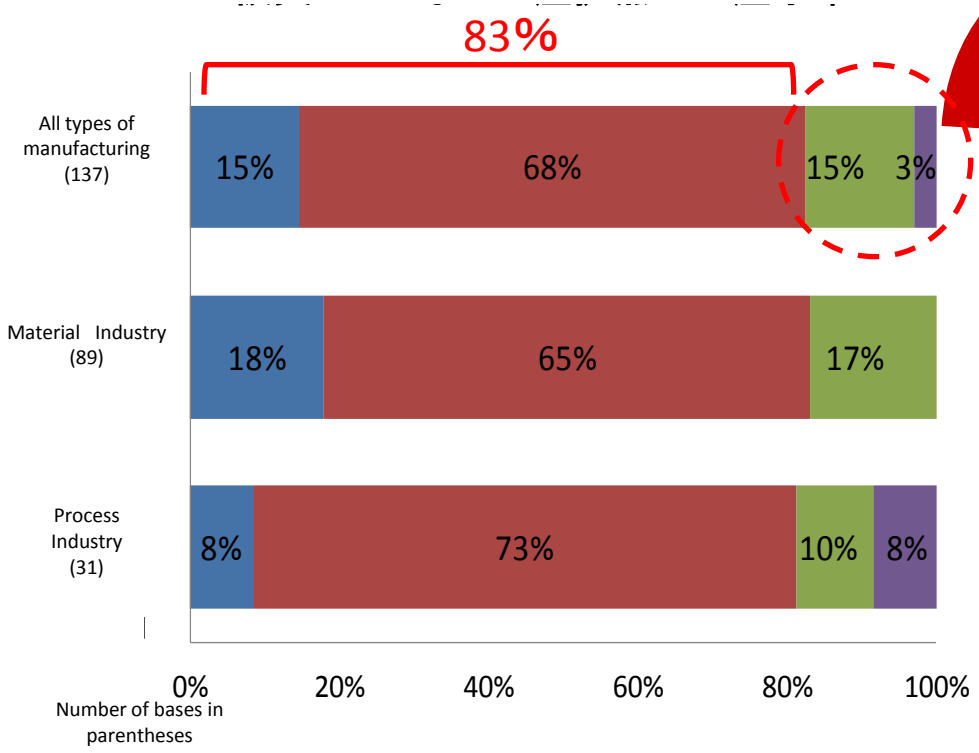


（※Survey period：June14-July1,2011）

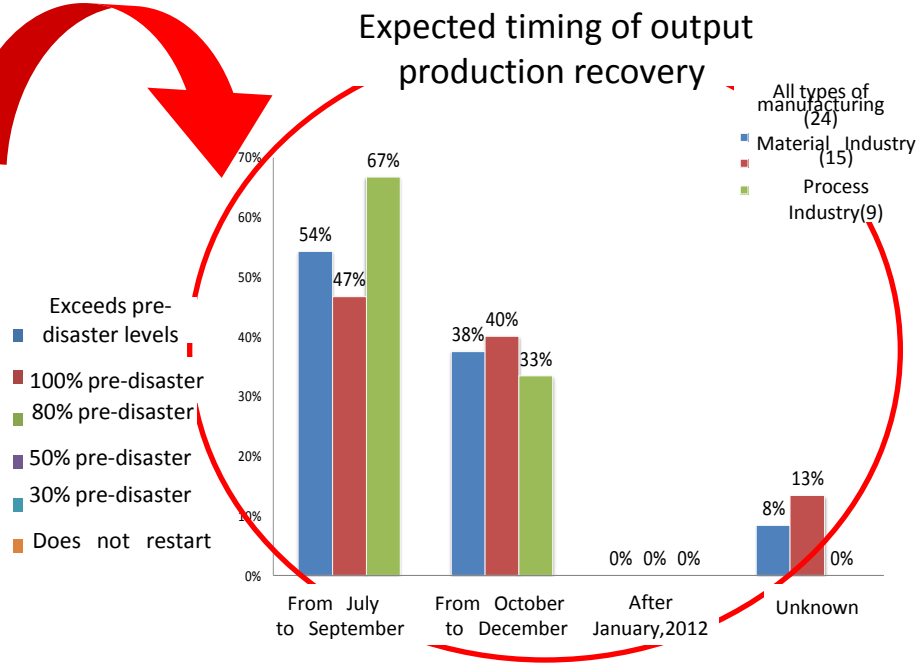
4. Current status of supply chains
(2) Output in the other areas (not directly affected by the disaster)

○83% of 137 production bases not directly affected by the disaster recovered output of production bases to pre-disaster levels, or exceeded former output.
○90% of production bases at which output is less than pre-earthquake level will have recovered their output by the end of 2011.

Outputs of production bases in areas not directly affected



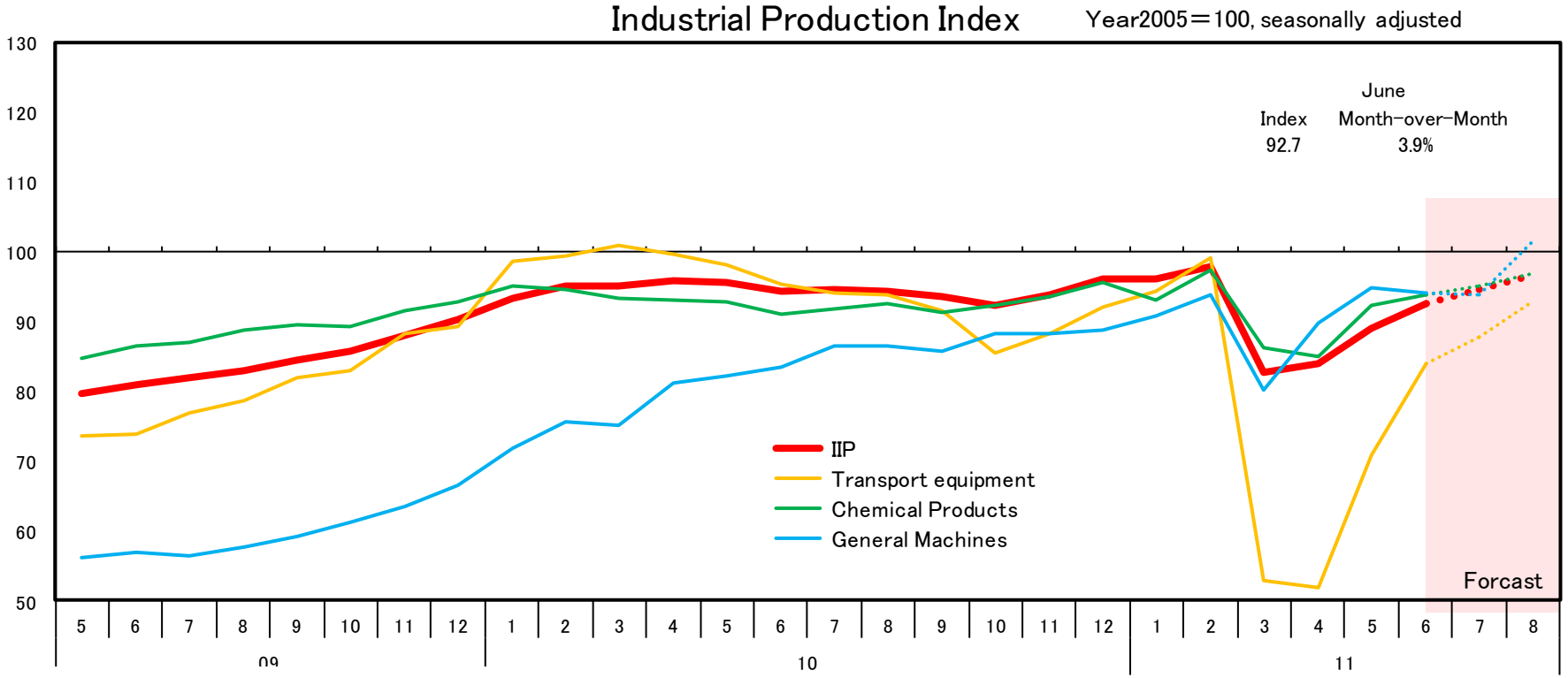
Expected timing of output production recovery



（※Survey period：June14-July1,2011）

5. Recovery of Industrial Production

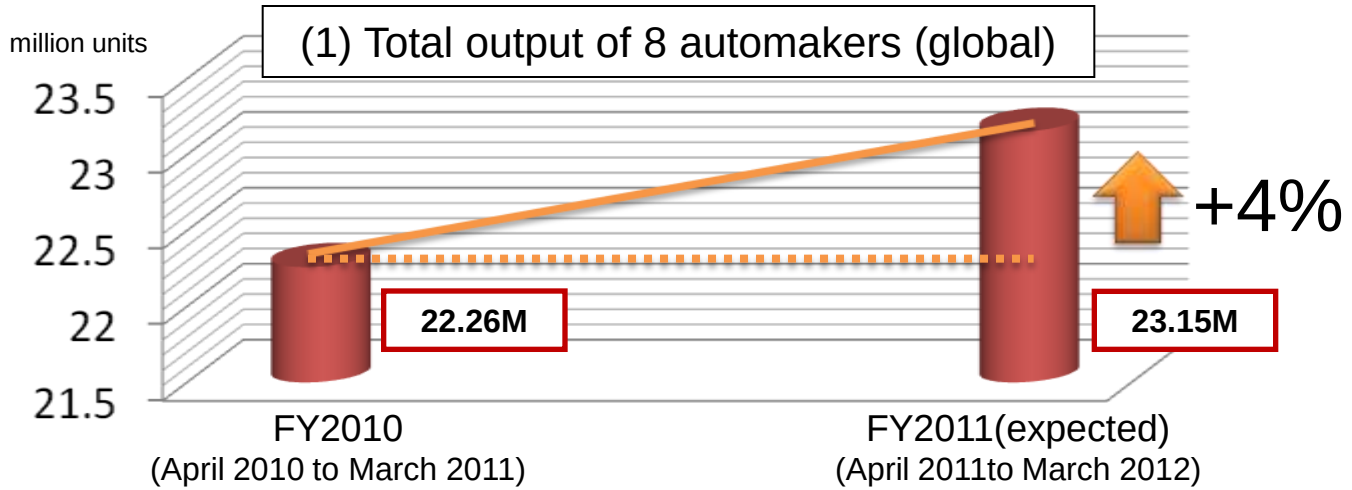
- Industrial production is recovering from the effects of the Great East Japan Earthquake.
- Industrial production in August will increase to 99% of the pre-earthquake level (Feb.).
- According to the Survey of Production Forecast in Manufacturing, production is expected to increase in July and August.

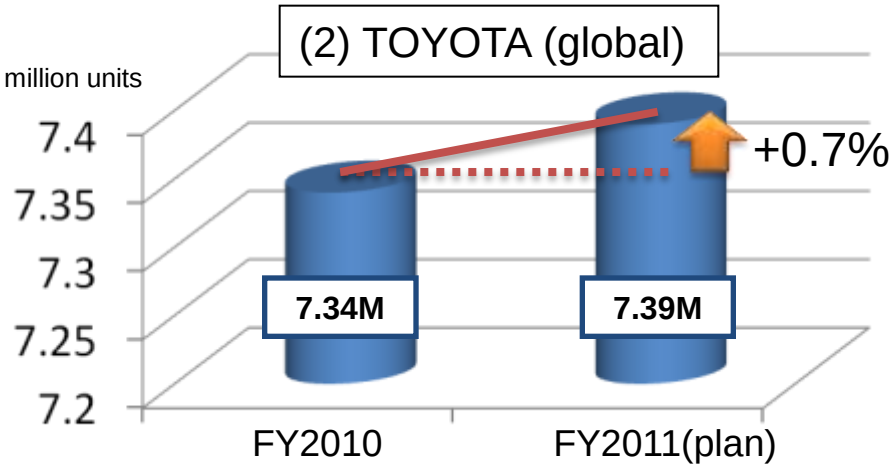


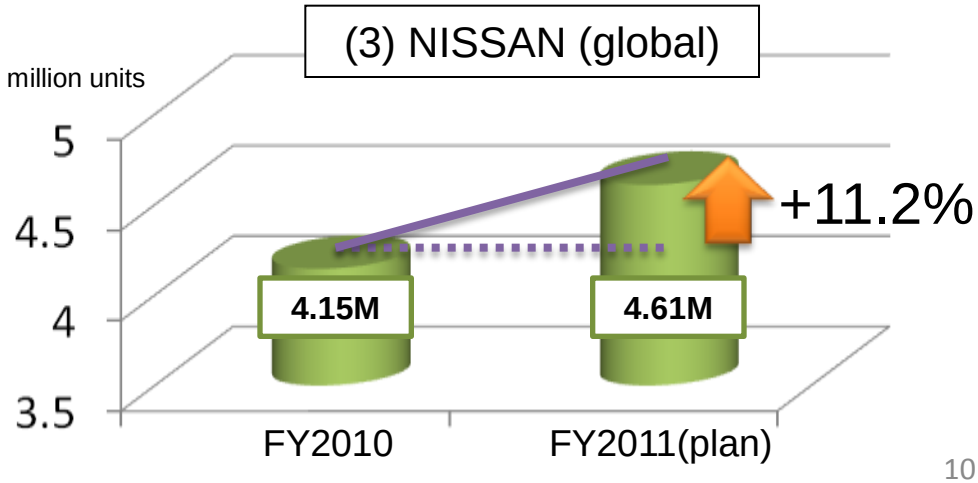
Source: Indices of Industrial Production, METI

6. Auto output is expected to grow despite the effects of the earthquake

➢Automakers plan to increase fiscal year 2011 (April 2011 to March 2012) output.
➢Total output of 8 Japanese automakers is expected to be 23.15M, roughly 4% higher than fiscal year 2010. (Nikkei)







7.Damage from the Great East Japan Earthquake and recovery (1)

- Damage to parts and materials suppliers temporally made it difficult for several automakers to operate normally soon after the earthquake.
- Production has resumed earlier than expected because of substitute production, reconstruction of suppliers network and also great efforts to recover.

NISSAN MOTOR CO., LTD.

Effects of Disaster

- Nissan Iwaki Factory in which more than 370,000 Nissan and Infiniti engines are produced annually was badly damaged. Windows on the plant's roof, ducts and pipes fell down and it was unsafe to go back inside.
- For Nissan, more than 50 dealerships and parts suppliers were damaged, and production across Japan shut down completely.

Status of Recovery

- At Iwaki Factory, it had been planned to resume full production in early June, but it resumed on May 17, two weeks ahead of schedule.

7.Damage from the Great East Japan Earthquake and recovery (2)

Shin-Etsu Chemical Co., Ltd.

Effects of Disaster

The Shin-Etsu Group has approximately 30% of the global share of silicon wafers. The main silicon wafer plant, the Shirakawa Plant, “Suffered from 1,000 gal shock of the earthquake, and its cleanrooms and some equipment were damaged.”（Fumio Akitani, vice-president）

Status of Recovery

On April 20, partial operations were restarted. On July 1, the Shirakawa Plant’s production capacity recovered to pre-earthquake levels.

Renesas Electronics Corporation

Effects of Disaster

Naka factory produces 20 percent of Renesas’s microcontrollers and System-on-a-chip solutions. There was partial damage to the ceiling, walls, electric wiring and some equipment.

Status of Recovery

Renesas expects it will be capable of significantly moving up the schedule by one month from the end of October to the end of September when the supply capacity of Naka factory will return to pre-earthquake levels.

7. Damage from the Great East Japan Earthquake and recovery (3)

Sumitomo Metal Industries, Ltd.

Effects of Disaster

Damage to Kashima steelworks was confirmed mainly at the port facilities and upstream manufacturing facilities. There was also damage within the steelworks, such as damage to the coke gas holders and the auxiliary facilities of the blast furnace.

Status of Recovery

Kashima steelworks was restored at high speed and it took only four days from the earthquake before its first shipment. On April 30 it resumed normal operation.

Sumitomo Metal, Kashima Steelwork (Kashima, Ibaraki)

Mitsubishi Chemical Corporation

Effects of Disaster

Production of ethylene in Kashima plants accounts for 10% of that in Japan. Since infrastructure around the plant area including the berths and roads were also damaged, delivery and shipment of cargo became impossible.
The ethylene plants were stopped after the earthquake.

Status of Recovery

Kashima plants had been rapidly restored including infrastructure. The Kashima No 2 plant was restarted on May 20. (Kashima No 1 plant was restarted on June 30)

Mitsubishi Chemical Kashima Plants (Kamisu, Ibaraki)

7. Damage from the Great East Japan Earthquake and recovery（4）

Companies	Situation after the earthquake	Status of recovery
Toyota Motor Corporation	Some factories suffered damage. Damage to parts suppliers caused trouble in the global production network. Toyota expected that production at normal level would be recovered later this year.	Production was approximately 70% of normal in June, on a global basis. Now, production in Japan has basically returned to pre-earthquake levels.
Hitachi Automotive Systems	Sawa works (Auto-parts manufacturing factories) were damaged due to the earthquake. The company has approximately 60 % of global share of air-flow sensors.	Operation of Sawa works restarted on April 4. Now, production capacity has recovered to pre-earthquake levels
Hitachi Vehicle Energy	The main factory in Hitachinaka-city which produces Lithium-ion batteries for vehicles suffered damage.	Since March 28, production of Lithium-ion batteries has resumed and shipment overseas restarted.
Hitachi ltd.	Damage to buildings and facilities was confirmed at Hitachi's main production bases in Ibaraki Prefecture, including cracks in walls, fallen ceilings, roofs and walls.	Production partially resumed at the end of May. Operation with full capacity resumed in mid April.
IHI corporation	The facility of Soma Aero-EngineWorks (Items produced: parts for aero engines, gas turbines and space development equipment) was shut down.	On March 29, partial operation at buildings where the effects were minor was restarted. Full operation was resumed mid May.

8. Overcoming the electricity shortage

(1) Expected electricity supply-demand balance

In case no atomic power plants under maintenance restart

East Japan

This summer	This winter
▲7.3%	▲1.0%
5.85 million kW shortage / 79.86 million kW peak time demand	0.74 million kW shortage / 71.49 million kW peak time demand

Mid and West Japan

This summer	This winter
▲0.0%	▲0.4%
0.03 million kW shortage / 99.68 million kW peak time demand	0.33 million kW shortage / 86.62 million kW peak time demand

Estimated peak time demand (TEPCO + Tohoku EPCO)

- Based on peak demand last year (July 23, 2010) : **74.8 million kW**
- On that day, maximum temperature was 37.8℃ in Tokyo (average temperature was 31.1℃)
- So far, the peak demand this year has been **61.27 million kW** (August 10, 2011, maximum temperature in Tokyo was 34.0℃).

8. Overcoming the electricity shortage

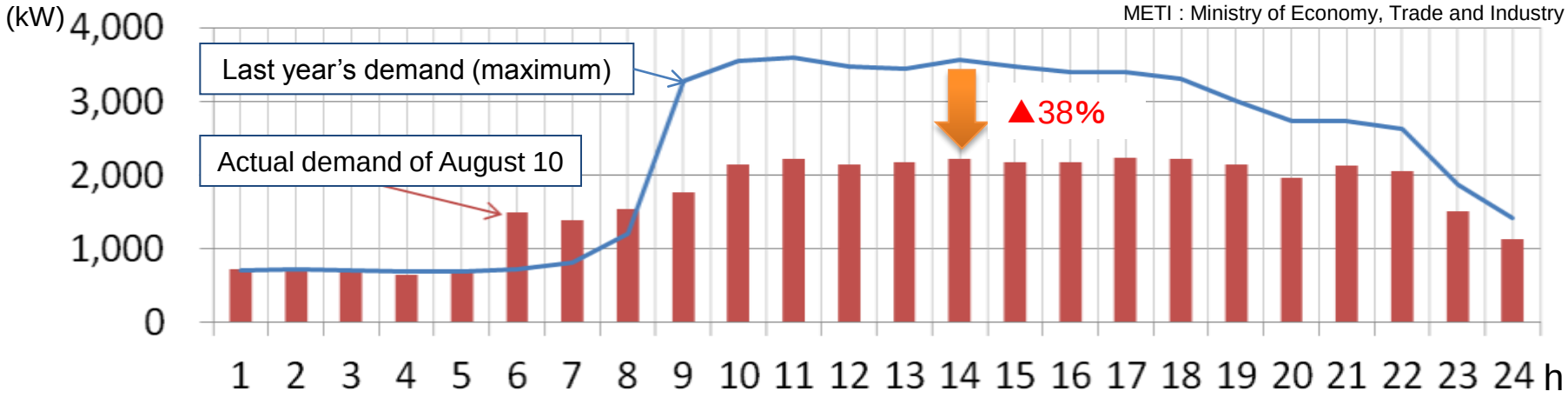
(2) Effects of electricity saving

Within TEPCO and Tohoku EPCO area
◎Large customers（over 500kW）: 15% restrictions on electricity use
◎Others: 15% reduction in electricity use

METI's electricity saving action plan

Air conditioning	Enforcing a temperature setting of 28℃, improving cooling efficiency, and the Cool Biz policy etc.
Lighting	Turning off or removing unnecessary lights and using LED lights
Office equipment	Power saving for PCs, reducing the number of printers and copiers to be used
Other equipment	Reducing the number of elevators in service, deactivating automatic doors
Others	Appointing a person in charge of electricity saving in each division/office to implement measures completely

METI : Ministry of Economy, Trade and Industry



8. Overcoming the electricity shortage

(3) Measures to improve energy demand and supply

Peak Cut Measures

- Expanding introduction of energy saving products such as LED lights
- Promotion of energy saving investment
- Expanding introduction of solar cells and batteries and etc.

Cost Decreasing Measures

- Expansion of renewable energy through the introduction of feed-in tariff
- Improvement of environment to facilitate various actors to enter
- Improvement of electric wholesale market

Nuclear safety measures

- Investigation of the accident
- Ensuring high standard safety
- Re-operating nuclear power plants on the above mentioned conditions

9. Effects of radioactivity from Fukushima Dai-ichi Nuclear Power Plant

➢Distance between Tokyo and Fukushima Dai-ichi Nuclear Power Plant is 230km (about 144 miles) .

Tokyo - Fukushima Dai-ichi : 230 km (about 144 miles)

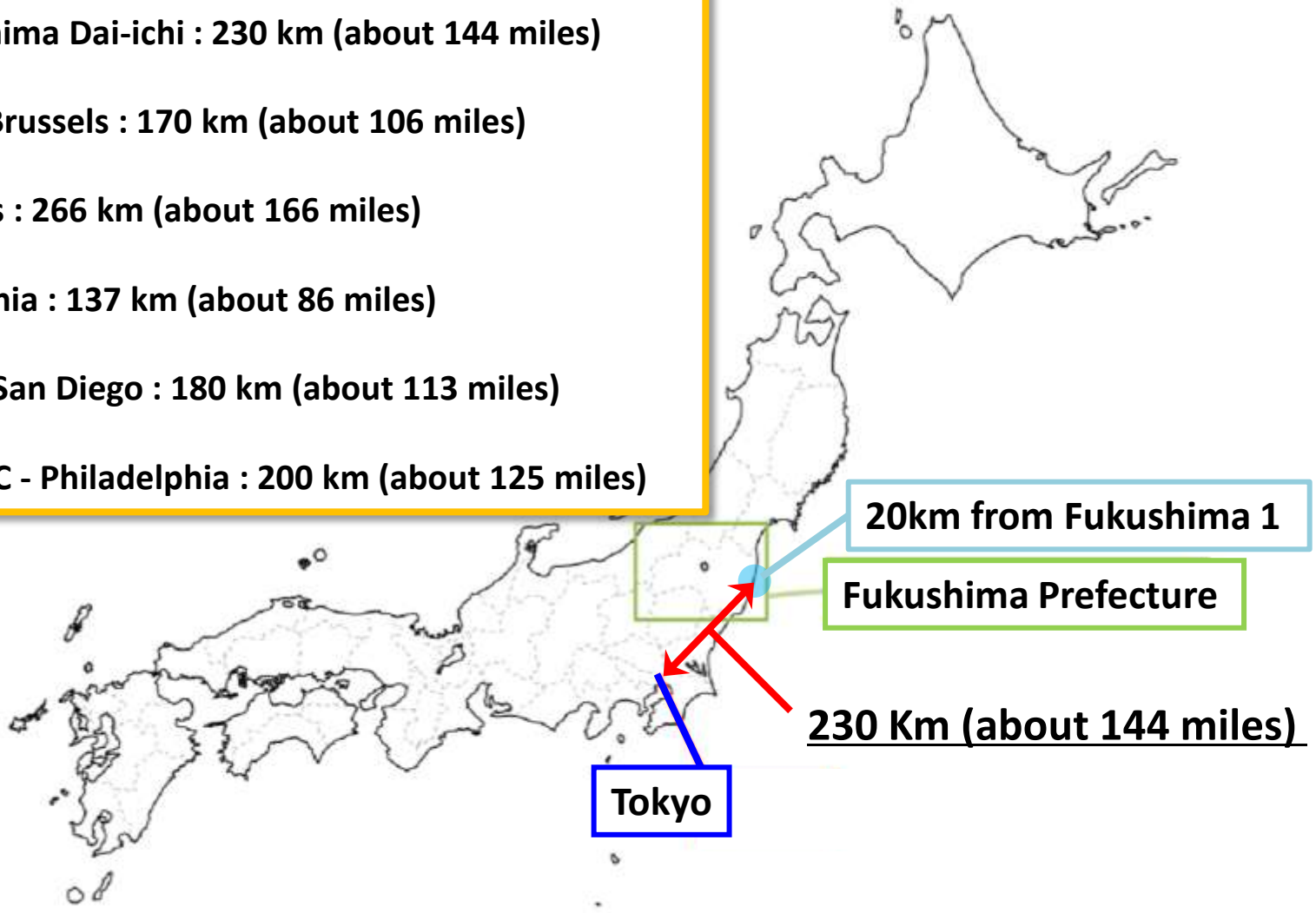
Amsterdam - Brussels : 170 km (about 106 miles)

Paris - Brussels : 266 km (about 166 miles)

NY - Philadelphia : 137 km (about 86 miles)

Los Angeles – San Diego : 180 km (about 113 miles)

Washington DC - Philadelphia : 200 km (about 125 miles)



9. Effects of radioactivity from Fukushima Dai-ichi Nuclear Power Plant

- The environmental radioactivity level in Tokyo after one month from the accident was lower than the level in New York and Hong Kong.
- Several UN agencies, including the WHO, have announced that radioactive materials have been of low concentrations and do not present health or transportation safety risks.

＜International organizations press release＞

○International Civil Aviation Organization
（April 11, 2011）

"Continuous monitoring around these airports confirms that radiation levels are well within safe limits from a health perspective."

○World Health Organization
（April 5, 2011, FAQs）

"WHO is not advising general restrictions on travel to Japan."

＜ Environmental radioactivity levels around the world＞

Hong Kong： 0.14 μSv/hour
New York： 0.095 μSv/hour
Tokyo： 0.078 μSv/hour

【Source】
Ministry of Education, Culture, Sports, Science and Technology（MEXT）, Hong Kong Observatory, Live radioactivity monitoring online USA
Hong Kong(as of13 April , 2011）, New York (7 days average to April 13, 2011)
Tokyo (as of 12 April, 2011）

＜Environmental radioactivity level in Tokyo＞

○The environmental radioactivity level in Tokyo, if the radioactivity level in mid April continues for three months, will be 168.5 μSv*.

* 0.078 μSV/hr (as April 12th, 2011）× 24hour × 90days=168.5μSV

[Radiation in daily life]
・An air trip between Tokyo and New York（RT): 200 μSv
・A gastrointestinal X-ray examination：600 μSv

Article by Bloomberg

April 1st, 2011(Bloomberg) -- Hong Kong, Cornwall Radiation Beats Tokyo even after Japan Nuclear Crisis

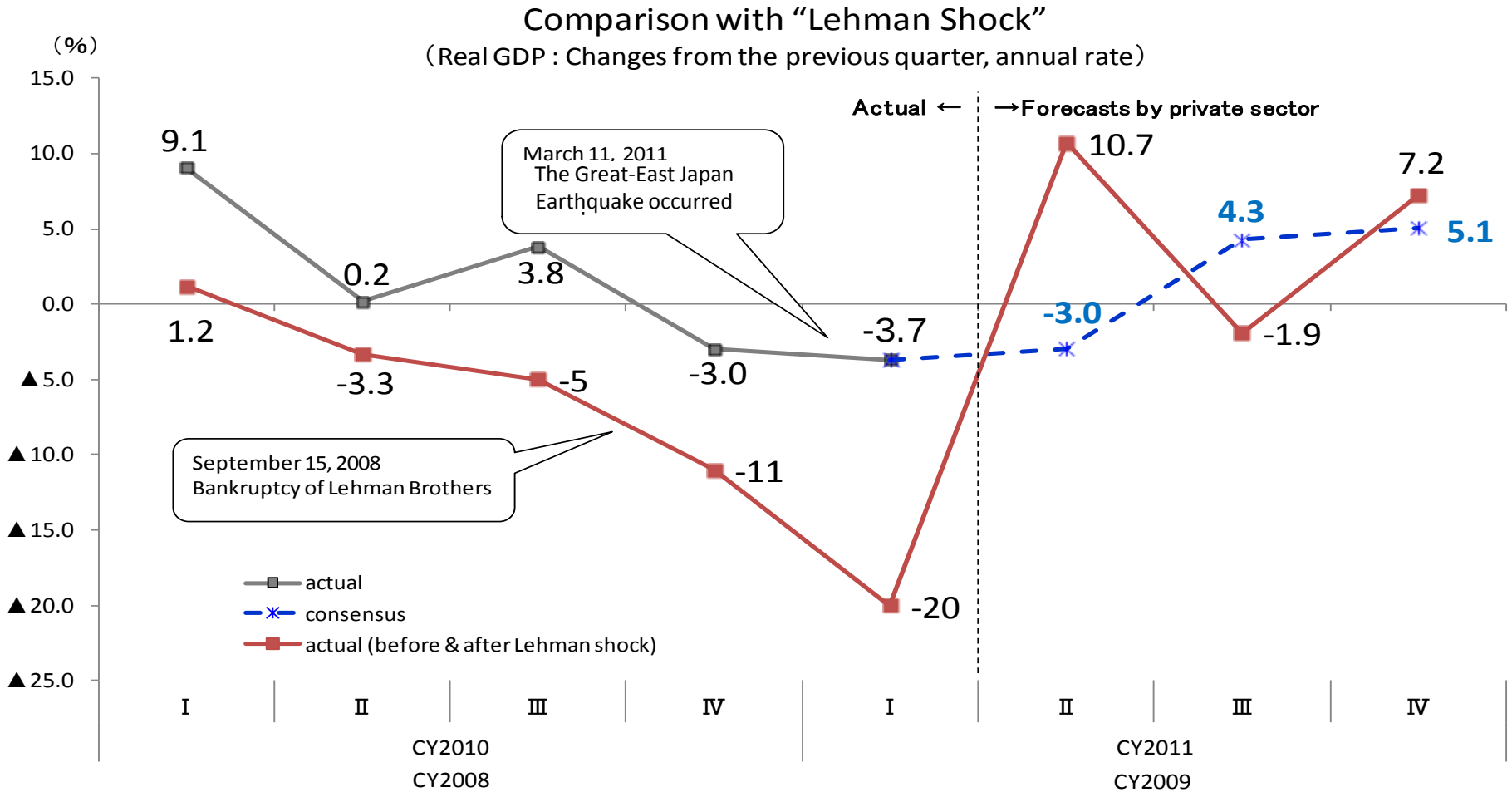
Typical amounts of radiation in Hong Kong exceed those in Tokyo even as workers struggle to contain a crippled nuclear plant in northern Japan, indicating concerns about spreading contamination may be overblown.

The radiation level in central Tokyo reached a high of 0.109 microsieverts per hour in Shinjuku Ward yesterday, data from the Tokyo Metropolitan Institute of Public Health show. That compares with 0.14 microsieverts in the Kowloon district of Hong Kong, the Hong Kong Observatory said on its website. A person is exposed to 50 microsieverts from a typical x-ray.

Tokyo's radiation level is only slightly higher than New York, where an average of 0.095 microsieverts an hour was recorded in the seven days to yesterday, according to a real- time Geiger counter reading set up as part of the Background Radiation Survey, a project where owners of the equipment feed their readings into a central database. The level in Tokyo the day before the accident averaged 0.0338 microsieverts an hour.

10. Macroeconomic impact : (1) Comparison with the “Lehman Shock”

➢According to private sector forecasts, Japan’s economy will grow in Q3 and Q4 2011 after slowing down in the Q1 and Q2. The degree of the slowdown is expected to be much less than after the “Lehman Shock.”



【Source】″National Accounts″（Cabinet Office）、″Monthly Survey of Japanese Economic Forecasts″（Economic Planning Association, July 11, 2011）

10. Macroeconomic impact : (2) Cabinet office estimate

➢The Cabinet Office forecasts that Japan's growth will be positive following the "Great East Japan Earthquake." It estimates damage to stock due to the disaster to be about 1% of the national stock.

（Real GDP、trillion yen）

	FY2011(2011,4～2012,3)		FY2012 (2012,4～2013,3)	FY2013 (2013,4～2014,3)
	First half	Second half		
Impact on GDP in the affected areas Decline in production due to damage to private plants & equipment	▲1. 25～▲0. 5	▲1. 25～▲0. 5	▲2. 25～▲1. 25	▲2. 25～▲1. 25
Impact on GDP in the non-affected areas via supply-chain connections	▲0. 25	—	—	—
Impact on recovery of damaged stocks (assuming a scenario where recovery takes 3 years) Increase in production corresponding to the gross fixed capital formation	2～3	3～5	6～9. 5	5～7. 75
Total impact on GDP	0. 5～2. 25	2～4. 25	3. 75～8. 25	2. 75～6. 5
In percent of real GDP (annualized)	0. 25～0. 75%	0. 75～1. 5%	0. 75～1. 5%	0. 5～1. 25%
Damage to stocks (Social capital, housing, private plants & equipment)	16～25 trillion yen（about 1% of all stock）			

【Source】 Cabinet Office

(※1) Prefectures covered : Hokkaido, Aomori, Iwate, Miyagi, Fukushima, Ibaraki, and Chiba. Period covered : FY2011 – FY2013

（※2） This table shows the difference from a baseline which corresponds to real GDP that would have realized if the Tohoku-Pacific Ocean Earthquake had not occurred. When calculating the ratio to real GDP, estimated real GDP for FY2010 as shown in the government economic outlook (Cabinet decision in January 2011) is used.

（※3） Total stock in Japan is 2,054 trillion yen.（by macroeconomic and fiscal model database 2009）

（※4） Excluding impact on GDP via constraint on electric power supply.

Yokota Air Base

“ARIGATO”

“Thank you”

"**ARIGATO**" is a word to express appreciation.
The photograph shows the word "**ARIGATO**" which people affected by the Great East Japan Earthquake wrote on the shore using pine trees for the United States Armed Forces which had supported with the restoration of Sendai Airport.
"**ARIGATO**" expresses the appreciation of the Japanese people for the support by each nation and their people, including the U.S.

Message from Prime Minister Naoto Kan regarding assistance received from overseas

Tuesday, March 22, 2011

I would like to express my most sincere appreciation for the condolences and assistance Japan has received from approximately 130 countries, more than 30 international organizations, and people all around the world in response to the Tohoku-Pacific Ocean Earthquake.

The rescue workers, search dogs, and nuclear power experts from various countries, as well as the human resources support from the U.S. Forces in Japan and others, assistance with food, medical supplies, blankets, and other supplies, and offers of assistance from over 670 NGOs and other organizations have all been profoundly uplifting to the Japanese people, who have come to realize acutely that “a friend in need is a friend indeed.” ...
On behalf of the Japanese people, I would like once again to express my deepest appreciation upon having received this truly tremendous outpouring of cordial assistance from around the world.

Naoto Kan
Prime Minister of Japan