

## Equities

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# Eastern Japan earthquake/autos industry: Part II

## Production stoppages likely to be prolonged

### ■ Industry Overview

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- **Prolonged production shutdown** — Not only damage to plants and equipment at both the automakers and their parts suppliers but also evacuation warnings stemming from radiation leaks at nuclear power plants and restrictions on electricity supply (rolling blackouts) imposed by Tokyo Electric Power are the major impediments to the restart of operations. Because of these unprecedented impacts, production shutdowns are likely to be prolonged, and we think in many cases production will not restart until end-March.
- **Genuine recovery from autumn onward** — Because it will take time to eliminate bottlenecks for electronic components, etc., and to deal with electrical power problems, we think it is increasingly likely that a genuine recovery in automobile production will be pushed back to at least autumn 2011.
- **Parts causing bottlenecks** — While only fragmentary information is available about bottlenecks to the recovery of production at individual companies, many firms are pointing to electronic components, rubber/resin-related products, metal castings, steel, and non-ferrous metals, etc. There also seem to be impacts from the impossibility of procuring from plants near the Fukushima Daiichi nuclear power plant, as well as the inability to retain staff due to the evacuation of residents from the area.
- **Electric power problem** — TEPCO's electric supply volume is unlikely to rebound substantially during the year, so production will have to be shifted to the Chubu region westward, where the supply of electric power is stable. In the Kanto area, which has electric supply problems, around-the-clock production is difficult, so the firms are unlikely to sustain two production shifts as before. FHI is heavily hit since its major facility is in Gunma Prefecture. Daihatsu and Mazda have been only slightly affected. Among the majors, Toyota has the capacity to absorb these blows to production.

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

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## Production stoppages likely to be prolonged

**We think in many cases production will not restart until end-March**

As of March 21, most automakers have now had their plants shut down for upwards of 10 days as a result of the Tohoku Pacific Earthquake that struck on March 11 (Friday). This reflects not only damage to plants and equipment at both the automakers and their parts suppliers but also evacuation warnings stemming from radiation leaks at nuclear power plants and restrictions on electricity supply (rolling blackouts) imposed by Tokyo Electric Power. Because of these unprecedented impacts, production shutdowns are likely to be prolonged, and we think in many cases production will not restart until end-March. Because it will take time to eliminate bottlenecks for electronic components, etc., and to deal with electrical power problems, we think it is increasingly likely that a genuine recovery in automobile production will be pushed back to at least autumn 2011.

**Shutdowns at electronic component plants have had a major impact**

Plant shutdowns stem mainly from the following: (1) direct damage to buildings and equipment at parts plants in Tohoku and Kanto (solutions include repairing damage with assistance sent from other locations or, where this is impossible, through a time-consuming shift of production to other plants; production stoppages for microcontrollers and other specially designed electronic components are especially damaging, as these cannot be easily sourced from other suppliers); (2) ongoing difficulty in securing basic materials (steel, nonferrous metals, chemicals), making it impossible to resume production even if plants are undamaged; (3) short supplies of fuel (electricity, water, light/heavy oil); (4) employees' inability to get to work owing to road damage and gasoline shortages; (5) logistics problems (road conditions, trucking arrangements, fuel supplies) that make it impossible to receive materials or ship finished products; (6) plant locations within the 30km evacuation zone surrounding the Fukushima nuclear plants; (7) electricity shortages and rolling blackouts, again making it impossible to resume production even if plants are undamaged.

## Full-scale resumption of production likely to take until at least autumn

**Following MMC, Suzuki and Mazda resume production, albeit limited**

The only company that restarted production last week was MMC (on Wednesday, 16 March), whose production facilities are in the Chubu region (Okazaki plant, Pajero manufacturing) and the Chugoku region (Mizushima plant). However, on 23 March, the company will suspend production again due to difficulty procuring parts.

This week, Suzuki and Mazda restarted production, albeit limited, on 22 March. Suzuki has restarted vehicle production at its major plant in Shizuoka Prefecture, but this is concentrated on work in progress on lines, so it continues to suspend engine production. With plants in Hiroshima Prefecture and Yamaguchi Prefecture, Mazda too has not experienced problems with its own facilities, but due to the disruption of the supply of steel sheet from Sumitomo Metal Industries, the restart of production could be limited.

Automakers are desperately checking parts procurement, but taking into account the elimination of parts supply bottlenecks and the status of electric power supply, we think automobile production is unlikely to genuinely restart until autumn..

See Figure 1 for the current production status and future plans.

Figure 1. Details the status of each company's operations and plans going forward

Code	Company	Plant / Related company	Location	Main Products	Production capacity (units/year)	Post-earthquake Production (as of Mar.22 AM7:00)	
7201	Nissan	Iwaki Plant	Fukushima prf. Iwaki city, Izumi-cho	VQ Engines	560,000	Suspending operation/ Continuing restoration activities.	Small fires broke out at casting facilities but have been extinguished. Partial damage to buildings and equipment
		Yokohama Plant	Kanagawa prf. Yokohama city	Engines	484,000 (FY10/3)	Resuming operations partially from Monday, March 21 (Announced Mar 20.)	Production of parts for overseas manufacturing and repair parts. (Based on parts availability from suppliers.)
		Tochigi Plant	Tochigi prf. Kawachi-gun,Kaminokawa-machi	Cars	220,000	Resuming operations partially from Thursday, March 24. (Announced Mar 20.)	Vehicle production is planned to resume, while inventory of supplies lasts.
		Oppama Plant	Kanagawa prf. Yokosuka city Kanagawa-ku	Cars	430,000 (Max 480,000)	Resuming operations partially from Thursday, March 24. (Announced Mar 20.)	Vehicle production is planned to resume, while inventory of supplies lasts.
		Kyushu Plant	Fukuoka prf. Miyako-gun, Kanda-machi	Cars	430,000 (Max 530,000)	Resuming operations partially from Thursday, March 24. (Announced Mar 20.)	Vehicle production is planned to resume, while inventory of supplies lasts.
7222		Nissan Shatai, Shouunan Plant	Kanagawa prf. Hiratsuka city	Cars	300,000	Resuming operations partially from Thursday, March 24. (Announced Mar 20.)	Vehicle production is planned to resume, while inventory of supplies lasts.
		Nissan Shatai Kyusyu	Fukuoka prf. Miyako-gun, Kanda-machi	Cars		Resuming operations partially from Thursday, March 24. (Announced Mar 20.)	Vehicle production is planned to resume, while inventory of supplies lasts.
7263		Aichi Machine Industry	Aichi prf. Nagoya city	Engines, MT		Same as Nissan (Not released)	
		JATOCO	Shizuoka prf. Fuji city	Transmissions		Suspending operation from Mar 16	Partial damage to buildings and equipment on Fuji plant and Fujiomiya plant by the earthquake in Shizuoka on Mar 15.
		Others					Hitachi-port(baraki prf.) 1300units tsunami damage Miyagi service center: 1000units tsunami damage
7202	Isezu	Fujisawa Plant	Kanagawa prf. Fujisawa city	Trucks		Suspending operations until Wednesday, Mar 23(Announced Mar.18)	Shutdown period was extended until Mar 23 from 18. (Announced Mar.18)
		Tochigi Plant	Tochigi prf. Tochigi city	Engines		Suspending operations until Wednesday, Mar 23(Announced Mar.18)	
		Isezu Engine Manufacturing Hokkaido	Hokkaido Tomakomai city	Small engines		Same as Isezu (Not released)	
5605		I Metal Technology, Tsuchiura Factory	Ibaraki prf. Tsuchiura City	Casting product		Shut down operations (Announced Mar.15)	No major damage (Announced Mar.15)
		I Metal Technology, Kita Ibaraki Plant	Ibaraki prf. Kita Ibaraki City	Casting product		Shut down operations (Announced Mar.15)	No major damage (Announced Mar.15)
		I Metal Technology, Kitakami Plant	Iwate prf. Kitakami City	Cylinder heads		Shut down operations (Announced Mar.15)	No major damage (Announced Mar.15)
5641		TDF	Miyagi prf. Shiota-gun	Casting product ,Front Axel connecting rod		Shut down operations (Announced Mar.14)	Broke out ,line at Heat Treatment Plant (Announced Mar.14)
7233		Jidosha Buhin Kogyo, Ebina Plant	Kanagawa prf. Ebina city	Engines, power train parts		NA (Announced Mar.16)	No major damage (Announced Mar.16)
		Jidosha Buhin Kogyo, Mooka Plant	Tochigi prf. Mooka city	Engines, power train parts		NA (Announced Mar.16)	No major damage (Announced Mar.16)
7203	Toyota	Toyota Plant (Honshe Plant)	Aichi prf. Toyota city	Forged parts, Parts for HVs		Suspending operations until Friday, Mar 25(Announced Mar.22)	Replacement parts: Resuming production from March 17.
		Motomachi Plant	Aichi prf. Toyota city	Cars	80,000 (CY09)	Suspending operations until Friday, Mar 25(Announced Mar.22)	Overseas manufacturing parts:Resuming production from March 21.
		Kamigo Plant	Aichi prf. Toyota city	Engines		Suspending operations until Friday, Mar 25(Announced Mar.22)	Shutdown period was extended until Mar 25 from 22. (Announced Mar.22)
		Takaoka Plant	Aichi prf. Toyota city	Cars	267,000 (CY09)	Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Miyoshi Plant	Aichi prf. Toyota city	Power train parts Parts		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Tsukumi Plant	Aichi prf. Toyota city	Engines	374,000 (CY09)	Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Miyochi Plant	Aichi prf. Toyota city	Suspension components		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Shimoyama Plant	Aichi prf. Toyota city	Engines		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Kinu-ura Plant	Aichi prf. Toyota city	Powertrain parts		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Tahara Plant	Aichi prf. Toyota city	Cars, Engines	321,000 (CY09)	Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Telho Plant	Aichi prf. Toyota city	Machinery equipment, Mold		Operate (from March 14)	
		Hirose Plant	Aichi prf. Toyota city	IC,Electronic control unit		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Toyota Motor Kyushu Miyata Plant	Fukuoka prf. Wakamiya city	Cars	430,000 285,000 (CY09)	Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Toyota Motor Kyushu Kanda Plant	Fukuoka prf. Miyako-gun	Engines,Cast, Machining	220,000	Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Toyota Motor Kyushu Kokura Plant	Fukuoka prf. Kitakyushu city	Trans axle for HV		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Toyota Motor Hokkaido	Miyagi prf. Kurokawa-gun	Transmissions		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Toyota Motor Tohoku	Miyagi prf. Kurokawa-gun	Brake, Suspension parts		Suspending operations until Friday, Mar 25(Announced Mar.22)	
7223		Kanto Auto Higashi-AjiPlant	Shizuoka prf. Suzono city	Cars		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Kanto Auto Iwate Plant	Iwate prf. Iwate-gun	Cars		Suspending operations until Friday, Mar 25(Announced Mar.22)	Partial damage to equipment, but no serious damage.
7221		Toyota Auto Body Fujimatsu Plant	Aichi prf. Kariya city	Cars		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Toyota Auto Body Inabe Plant	Mie prf. Inabe city	Cars		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Toyota Auto Body Yoshiwara Plant	Aichi prf. Toyota city	Cars		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Central Motors	Miyagi prf. Kurokawa-gun	Cars		Suspending operations until Friday, Mar 25(Announced Mar.22)	Shut down operations.
8201		Toyota Industries Corporation, Obu plant	Aichi prf. Obu plant	Batteries for HVs		Suspending operations until Friday, Mar 25(Announced Mar.22)	
		Primearth EV Energy, Kosai factory	Shizuoka prf. Kosai city	Batteries for HVs (Jan 2010-)		Same as Toyota (Not released)	
		Primearth EV Energy, Miyagi factory	Miyagi prf. Kurokawa-gun	Batteries for HVs (Jan 2010-)		Same as Toyota (Not released)	
7205	Hino	Hino Plant	Tokyo Hino city	Trucks		Suspending operations until Friday, Mar 23(Announced Mar.22)	Production suspension was extended until Mar 23 from 22. (Announced Mar.22)
		Hamura Plant	Tokyo hamura city	Light Trucks		Suspending operations until Saturday, Mar 26(Announced Mar.22)	
		Nitta Plant	Gunma prf. Ota city	Engines		Suspending operations until Friday, Mar 25(Announced Mar.22)	
7261	Mazda	Honsha Plant	Hiroshima prf. Aki-gun	Cars		Resuming operations partially on Tuesday, March 22. (Announced Mar 18.)	All factories did a shutdown until March 21.
		Hofu Plant	Yamaguchi prf. Hofu city	Cars		Resuming operations partially on Tuesday, March 22. (Announced Mar 18.)	Resuming production at both plants:Replacement parts, parts for overseas production and vehicles.
7262	Daihatsu	Ikedo Plant	Osaka Ikedo city	Cars,Press parts		Suspending operations until Thursday, March 24(Announced Mar.22)	Production suspension was extended until Mar 24 from 22. (Announced Mar.22)
		Shiga (Ryuo) Plant	Shiga prf. Gamu-gun	Cars, Engines,TM		Suspending operations until Thursday, March 24(Announced Mar.22)	
		Kyoto Plant	Kyoto Otokuni-gun	Cars		Suspending operations until Thursday, March 24(Announced Mar.22)	
		Daihatsu Kyushu /Ohita Plant (Nakatsu Plant)	Ohita prf. Nakatsu city	Cars		Resuming operations partially from Tuesday, March 22(Announced Mar.18)	Resuming production at Nakatsu factory(plant-1) on Mar 22.
		Daihatsu Kyushu /Kurume Plant	Fukuoka prf. kurume city	Engines,		Suspending operations until Thursday, March 24(Announced Mar.22)	
7267	Honda	Saitama Plant, Sayama factory	Saitama prf. Sayama city	Cars	340,000 (CY09)	Suspending operations until Wednesday, Mar 23(Announced Mar.18)	
		Saitama Plant, Ogawa factory	Saitama prf. Sayama city	Engine parts etc			Suspend shipments of overseas production parts from Mar 16 according to Nikkan Kogyo Shimbun's article on Mar 17.
		Suzuka Plant	Mie prf. Suzuka city	Cars	390,000 (FY3/10)	Suspending operations until Wednesday, Mar 23(Announced Mar.18)	Partial damage to buildings.
		Tochigi Plant	Tochigi prf. Mohika city	Engine parts etc		Suspending operations until Wednesday, Mar 23(Announced Mar.18)	
		Hamamatsu Plant	Shizuoka prf. Hamamatsu city	Transmissions	610,000 (FY3/09)	Suspending operations until Wednesday, Mar 23(Announced Mar.18)	
		Kumamoto Plant	Kumamoto prf. Kikuchi-gun	Large-size motorcycles		Suspending operations until Wednesday, Mar 23(Announced Mar.18)	Postpone the New Fit shuttle briefing.
		Others					
7269	Suzuki	TakatsukaPlant	Shizuoka prf. Hamamatsu City	2W Engines		Suspending operations until Wednesday, Mar 23(Announced Mar.18)	All factories did a shutdown until March 20.
		Kosai Plant	Shizuoka prf. Kosai-shi	Cars		Operate partly on Mar 22 and 23 (Announced Mar.18)	
		Iwata Plant	Shizuoka prf. Iwata-shi	Cars		Operate partly on Mar 22 and 23 (Announced Mar.18)	
		Toyokawa Plant	Aichi prf. Toyokawa city	2W, outboard engine		Operate partly on Mar 22 and 23 (Announced Mar.18)	Motorcycles assembling/Operate/ Outboard motor assembling:Suspend
		Sagara Plant	Shizuoka prf. Makinohara city	Engines, Cars		Operate partly on Mar 22 and 23 (Announced Mar.18)	Passenger car assembling/Operate/ Automobile engines assembling :Suspend
		Osuka Plant	Shizuoka prf. Kakegawa city	Forged parts		Operate partly on Mar 22 and 23 (Announced Mar.18)	
7270	FHI	Honsha Plant	Gunma prf. Ota city	Mini vehicles		Suspending operations until rom Thursday, March 24. (Announced Mar 21.)	Production suspension was extended until Mar 24 from 22. (Announced Mar21.)
		Yajima Plant	Gunma prf. Ota city	Cars		Suspending operations until rom Thursday, March 24. (Announced Mar 21.)	
		Kita Plant	Gunma prf. Ota city	Parts		Suspending operations until rom Thursday, March 24. (Announced Mar 21.)	Restart production respectively: parts for overseas production onMar 23 and production of spare parts on Mar 24.
		Oizumi Plant	Gunma prf. Oizumi city	Engines, TM		Suspending operations until rom Thursday, March 24. (Announced Mar 21.)	Aerospace and Eco Technologies : normal operation from Mar 14. Industrial Products : normal operation from mar 15.
		Isesaki Plant	Gunma prf. Isesaki city	Parts		Suspending operations until rom Thursday, March 24. (Announced Mar 21.)	

Source: Company data, Citi Investment Research and Analysis

Parts causing bottlenecks include electronic components, rubber/resin products, castings, and steel

## Parts causing bottlenecks

While only fragmentary information is available concerning the parts that are bottlenecking the resumption of production for individual automakers, in this section we provide several specific situations.

- 1) Electronic components – In our discussions with management, many companies cited electronic components as the primary supply bottleneck. Because plants are specially certified based on the specifications of each company, the production of microcomputers is not easily shifted to other facilities. As microcomputers are used in many very important parts, including engine control systems, brake control systems, and navigation systems, the restart of automobile production could be substantially delayed if the reopening of these plants is pushed back.
- 2) Rubber/resin-related parts – Rubber/resin-based parts are causing bottlenecks because of the suspension of operations at materials plants in quake-stricken areas, and in some cases secondary parts makers have also suspended production.
- 3) Castings – There are cases of facilities being damaged, so the restoration of machinery/facilities will take time.
- 4) Steel/non-ferrous metals – Sumitomo Metal Industries has shut down operations at its Kajima works, affecting steel procurement in some cases.

Damage to nuclear power plant also having an affect

The production of an automobile requires 20,000-30,000 parts, and the severe impact from the quake means that there could be plans that cannot resume production even at the start of April. There also seem to be impacts from the impossibility of procuring from plants near the Fukushima Daiichi nuclear power plant, as well as the inability to retain staff due to the evacuation of residents from the area.

## Considering the electric power supply situation in the Kanto region, stable production requires a shift to the Chubu region westward

Kanto region unable to sustain two-shift production

Even if parts makers resume production, TEPCO's electric power supply volume is unlikely to recover significantly during the year, so stable production will require the manufacture of key parts to be shifted to the Chubu region westward, where the electric power supply is stable. As for the Kanto region and the Tohoku region, where electric power supply is a problem, around-the-clock production will naturally be difficult, and we think production on two shifts as before is probably unsustainable.

Power supply is not an issue in the Chubu region westward

The automobile makers with few factors (eg, electric power) that are squeezing operations at major plants are: Daihatsu, which has long been based in Osaka (vehicle production plants in Osaka, Saga, and Oita), Hiroshima-based Mazda (plants in Hiroshima and Yamaguchi prefectures), Suzuki (Shizuoka Prefecture), MMC (Aichi and Okayama Prefectures), and Toyota, with its home in Aichi Prefecture (plants in Aichi Prefecture and Fukuyama Prefecture). If these

With a heavy presence in the Kanto region, FHI greatly affected by electric power supply problems

automobile makers shift to parts plants located in the Chubu region westward for the procurement of parts that are difficult to acquire in Kanto and Tohoku, we think production could be restored relatively quickly. Individual automobile makers have been diligently determining the parts for which suppliers/supply areas can be easily changed and those that cannot, and we think decisions will have to be made quickly because of the time required for certifying plants for the production of electronic components, etc.

Meanwhile, FHI (Gunma Prefecture), Isuzu (Kanagawa, Tochigi), and Hino (Tokyo, Gunma) have major plants only in the Kanto area, so they are probably being greatly affected by the electric power supply problem. Specifically, FHI, which had been operating at full production because of brisk shipments of the Legacy, etc., has likely experienced a sizable drop in its utilization rate. Truck-makers Isuzu and Hino have long been producing chassis on one shift, so the degree of decline in their utilization rate will probably be small. However, the production of engines for vehicles assembled in Thailand and Indonesia, for which demand has been brisk, is likely to be affected, and we think the impact from this is large.

Nissan is probably contemplating shifting production to its Kyushu plant, and Honda to its Suzuka plant. However, in Nissan's case, shifting production away from its Ibaraki plant, which produces luxury models, will be difficult. Another bottleneck for Nissan is that there is no alternative facility for the Iwaki plant, which produces V-6 engines. Honda plans to start producing mini vehicles at its Suzuka plant in 2012, so it is possible that it will not be able fully take on production from the Saitama plant.

Figure 2. Domestic production facilities of Auto makers



Source: Company data, Citi Investment Research and Analysis



## Appendix A-1

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