

# LPG proved to be the Most Reliable & Efficient in Crisis

June 14, 2011

*LPG Center of Japan*

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## AGENDA

- ① What happened on March 11, 2011
- ② LPG : Proved to be the most reliable & efficient in a Crisis Situation.
- ③ LPG may contribute to the current Energy Situation and toward New Energy Policy

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## Thank you for World Support for JAPAN



- **People and Governments of 159 Countries and 43 International Organization provided support and aid to Japanese People and Government.**

Such as:

Presidents and Prime Ministers Visit.  
ex. France, Australia, China, Korea,---

Military and Special Task teams, from March 12.  
ex. U.S.A., Korea, Singapore, Taiwan, China,  
New Zealand, Australia, Chili, German, Swiss---

Monetary Donation from the World:

ex. Taiwan \$180Million (most from ordinary people)

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## Thank you for World Support for JAPAN



### Energy Support (Except Nuclear):

\* Saudi Arabia:

- Saudi-Iwatani LPG Emergency Relief Program from April 2009
- Saudi LPG Emergency Relief Fund established May11, 2011

\* Kuwait: Crude Oil - 5 mil B.\* Donation to Japan.  
\*corrected

\* Qatar: LNG - 4mil ton Offer

\* Indonesia: LNG - 1mil ton Offer

\* Korea: LNG - 1~1.5mil ton/month (Swap)

\* Russia: LNG from Sakhalin Offer

--- and more

## ① What Happened on March 11, 2011



- The Great East Japan Earthquake
  - March 11, 14:46
  - Magnitude 9.0
    - (aftershocks: ↑ M7 -5times, ↑ M6-8, ↑ M5-over500)
  - Sanriku Coast in Tohoku, East Japan (600Km north to south)
  - Victims:
    - death more than 15,000
    - injured more than 5,500
    - missing more than 9,000
  - Lost & Damaged Houses: more than 500,000
  - Lost LPG Cylinders: more than 130,000 (in Miyagi estimated)
  - Lost Automobiles: more than 260,000
  - Lost fishing boat: more than 22,000
  - Victims still in Shelters: more than 110,000

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## ① What Happened on March 11, 2011



- Features: Complex Disaster of a. b. & c.
  - a. Massive Earthquake & Many Aftershocks
  - b. TSUNAMI (Tidal waves)
  - c. Nuclear Accident ⇒ Power Shortage
    - ↓ ↓
  - d. Wide Areas of Japan were damaged
- \* a/b and c have quite different nature of disaster
  - a & b: immediate affects and visible
  - c: long term and invisible, affected to all Japanese energy system

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# ① What Happened on March 11, 2011



Earthquake Intensity  
(Japanese Scale 1~8)  
14:46, March, 11



Earthquake Center  
M6.6, 16:29

Earthquake Center  
M9.0, 14:46

Earthquake Center  
M7.4, 15:15

# ① What Happened on March 11, 2011



(Height of Tsunami reached more than 35m on land)

# ① What Happened on March 11, 2011



Cosmo Refinery in Chiba



Sendai Airport

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# ① What Happened on March 11, 2011



(Top of Tokyo Tower was bended by shake.)



(2004)



(2011.3)

(Fukushima No.1 NPS before & after )

(photo: Google)



## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation.



- Through this unfortunate disaster, LPG has reconfirmed its efficiency & validity in a Crisis Situation.

⇒ it is depend on the nature of LPG, such as Quick, Easy & Safe

- ① Ultimate Decentralized Energy:  
Quick recovery, Easy-Transport, Easy-Storage & Installation, no-Pollution, no-Electricity required, Quick supply of hot-water & heating at the shelters etc.
- ② Variety of Methods of Use and Safety Equipment:  
Portable Stove/Canister, Automatic Shut-off Valve and Tube, Autogas, Emergency Bulk Tank, fill into City Gas line etc.
- ③ Quick delivery to the people right after import, since LPG is a product for consumer's immediate use and no reforming process required.

**“LPG is quite suitable for a country with many Mountains and Islands, like Japan”**

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## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation.



### ● LPG: What happened

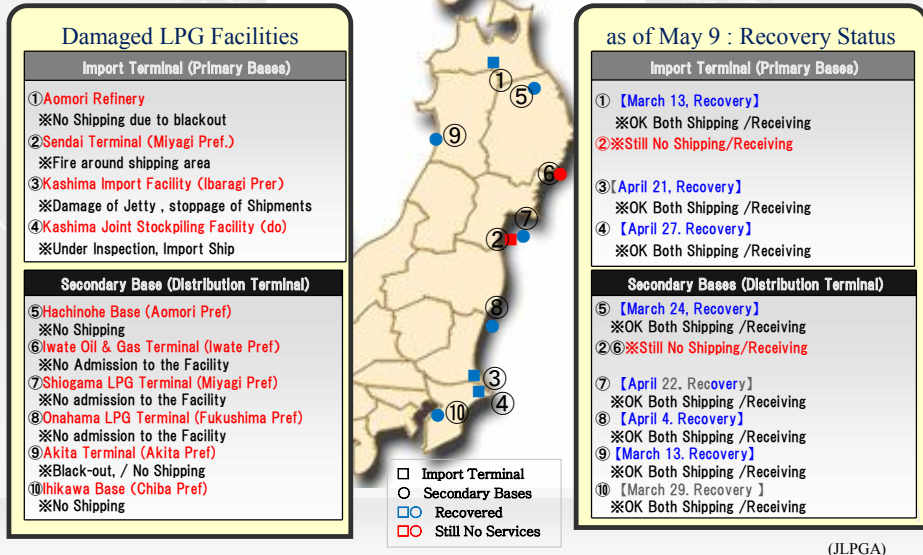
- LPG Facilities Sustained Damages and Quickly Recommence Operations, both
  - ⇒ Distribution Side &
  - ⇒ Consumer side(Utilities connected through pipe-line/cable took longer. even today, in some area water supply systems have not resumed.)
- A lot of LPG cylinders are missing.  
(in Miyagi Pref. more than 130,000 were estimated as lost by Tsunami.)

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## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation.



= Damages & Recovery of LPG Terminal/Bases =



## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation.



### Damages on LPG User side

■ Consumers/Households (1,000)      ■ Distributers/Filling Stations & AutoGas Stations

•Prefecture	House-holds	Consumers/Households (1,000)		Prefecture	Distributers/Filling Station		AutoGas Station	
		Damaged (3/23)	Recovrd (5/6)		Total	Damaged (3/23)	Total	Damaged (3/23)
Aomori/Iwate	930	50	30	Aomori/Iwate	1009	19	53	5
Miyagi	580	120	90	Miyagi	732	26	36	11
Fukushima	630	50	20	Fukushima	884	58	40	6
Ibaragi/Chiba	1,900	0	0	Ibaragi/Chiba	2,336	2	108	2
<b>TOTAL</b>	<b>4,040</b>	<b>220</b>	<b>140</b>	<b>TOTAL</b>	<b>4,961</b>	<b>105</b>	<b>237</b>	<b>24</b>

⇒  
\*80,000 houses were totally lost by tsunami

## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation.



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## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation



### LPG: What we did. 1

#### Support for the Victims by LPG Industry

- **Quick Recovery : the Most Important at Disaster**
- **Portable Stove/Canisters and LPG Cylinders for emergency use were provided.**  
(aprx 60,000 Portable stoves, more than 150,000 canisters and 3,000 cylinders were provided.)
- **Emergency Bulk Tank & Equipment:**  
⇒ Emergency Bulk Tank were proved to be very effective.

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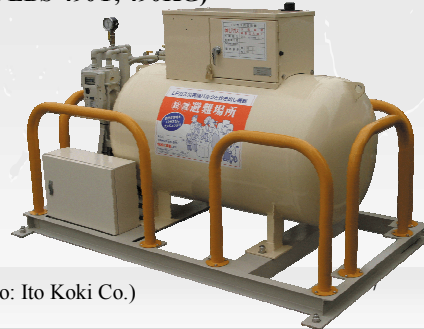
## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation.



### Tension Automatic Shut-off Gas-Hose Prevent Leakage



### Emergency Bulk Tank System (ex. EBS-490Y, 490KG)



(Photo: Ito Koki Co.)

## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation



### LPG: What we did 2.

- **Temporary Housing for the Disaster Victims:**
  - ⇒ approx. 70,000 Required and LPG applied for almost all Temp. housing
  - ⇒ LPG Coupon ticket will be provided to the victims for the payment under Saudi/Relief fund through Japan LPG Sales Association (JLSA).  
(\$20mil equivalent petroleum product was donated by Saudi Arabia)
- **AutoGas Taxies** Contributed for the transportation and emergency deliveries in the Disaster sites.
- LPG provided **Hot/Warm Food & Water** for the Disaster Victims.  
Tohoku in March, Temp. ↓0 ℃, **Snow**

## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation.



Petro Station "No Fueling Services" (3/16 Snow)



Autogas Station (No long line)



Long line for fueling, sometime 2Km. Limit of fueling, 20ltr--

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## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation



### LPG : Why we can do it.

#### ⇒ Well Prevention of Disaster

- Emergency Cooperation Agreement among the Industry members and municipal governments.

JLPGA(Importers' Association) and JLSA (Distributor's Association) with Government organize the committee regularly.

- JLPGA has the Emergency Cooperation Agreement among the members to accommodate each other with supply of LPG.
- JLSA: members, prefecture associations, have the Emergency Cooperation Agreement with local governments to secure the services and safety in the area.

- Emergency Relief Program between Saudi & Iwatani from April 2009 and doubled its support on March 22.

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## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation



### LPG : Why we can do it. continue-

- Seminars for safety use to both consumers and distributors are organized by the industry regularly.
- National Stockpile (currently 650,000ton and additional 850,000 ton in several years) for emergency release as a consumer product.
  - \* Petroleum Stockpiling with Crude Oil require processing.

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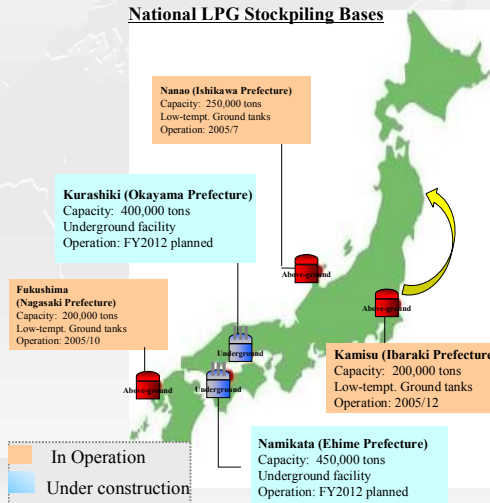
## ② LPG : Proved to be the most reliable & efficient in a Crisis Situation.



Emergency Release of 40,000ton of LPG from Kashima National Stockpiling Base to adjacent Kashima Import facility on April 4 for the distribution to TOHOKU region.

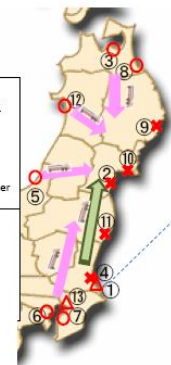
This is the first time National Stockpile of LPG was rereleased since the operation started in 2005.

### National LPG Stockpiling Bases



### Status of Damaged LPG bases in the Tohoku & Kanto regions and Niigata Prefecture (as of March 30).

- <LPG import bases (primary)>
- △ (1)Kashima LPG Joint Stockpiling
  - × (2)Sendai gas terminal
  - (3)Aomori manufacturing plant
  - × (4)Kashima import base
  - (5)Niigata gas terminal
  - (6)Kawasaki LPG base and two other bases
  - (7)Chiba LPG base and three other bases
- <LPG secondary bases>
- (8) Hachinohe base
  - × (9) Iwate oil gas terminal
  - × (10)Shiogama LPG terminal
  - × (11)Onahama LPG terminal
  - (12)Akita terminal
  - △ (13)Ichikawa base
- (Note)  
○ in full operation  
△ part operation possible  
× operations have been suspended



(METI)

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### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### 【Summary for LPG】

##### LPG may contribute:

###### a. Near Term (within a year):

- \* LPG will be provided for the shelter and temporary housing.
- \* LPG will be provided for the Thermal Power Station to make up the shortage of LNG supply:
  - ⇒ Currently 300,000ton/year for Anegasaki Thermal PS of TEPCO
  - ⇒ may have chance to add “0.3~1 million ton” for Anegasaki and Yokkaichi TPS of Chubu

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### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### 【Summary for LPG】

##### LPG may contribute:

###### b. Long Term:

- \* LPG will be re-recognized its importance as the energy source and increase utilization.
  - ⇒ Households will return to LPG from all-electrical housing.
  - ⇒ LPG will be applied for new heat and generation system, such as GHP, Co-Generation, Fuel Cell etc.
  - ⇒ collaboration with Renewable energy, such as Solar power & heat and Bio Fuel etc.
  - ⇒ For City gas, as the caburentant of lean LNG.
  - ⇒ For additional National Stockpiling (expected. 850,000ton in 4-5 years after 2013/14 onward.)
  - ⇒ Conversion of Fuel for Industry Boiler from Oil to LPG.  
(promoted with government subsidiary)

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### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### LPG Reference: (Demand)

##### Demand FY2009/2010

(1,000ton)

Sector	FY2009	FY2010	Growth (%)
Residential & Commercial	8,671	8,855	102.1
Industrial	2,706	2,827	104.5
City Gas	769	951	124.1
Transportation	1,223	1,188	97.1
Chemical	2,740	2,319	84.6
Electricity	312	305	97.9
Export	203	158	77.8
<b>TOTAL</b>	<b>16,624</b>	<b>16,603</b>	<b>99.9</b>

(data :JLPGA)

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### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### LPG Reference: (Import sources & Trend)

##### Japanese Import (Country)

(J-Fiscal Year, 1,000ton)

Country	FY1995	2000	2005	2008	2009	2010
Saudi Arabia	6,231	6,310	5,405	3,678	2,662	2,120
Iran	98	274	368	503	554	821
Kuwait	1,436	1,344	1,489	1,441	1,410	1,422
Qatar	752	504	1,262	2,815	2,774	3,272
U.A.E.	3,092	4,028	3,428	2,877	2,436	3,125
Other ME	19	14	15		9	
<b>Sub-Toal ME</b>	<b>11,628</b>	<b>12,474</b>	<b>11,967</b>	<b>11,314</b>	<b>9,845</b>	<b>10,760</b>
Australia	465	781	1,084	833	767	732
Timor-Leste				596	445	440
Algeria		18		110	179	67
Nigeria			68	22	23	114
Malaysia	385	375	222	113	92	64
Indonesia	2,322	936	637	18	47	5
U.S.A.	22		33	63	131	149
Other	3	267	82	57	68	
<b>Sub-Toal Others</b>	<b>3,197</b>	<b>2,377</b>	<b>2,126</b>	<b>1,812</b>	<b>1,752</b>	<b>1,571</b>
<b>TOTAL</b>	<b>14,825</b>	<b>14,851</b>	<b>14,083</b>	<b>13,126</b>	<b>11,597</b>	<b>12,331</b>

(data :JLPGA)



### ③ LPG may contribute on the current Energy Situation and toward New Energy Policy



#### 【General Discussion : Energy Situation in Japan】

#### Current Energy Situation in Japan 1:

Energy  $\rightleftharpoons$  Electricity ,  
for the people in Japan at this moment.

Accident of Fukushima Nuclear Power Station of TEPCO lead the lost of confidence on Nuclear Power and brought all Japan into severe Shortage of Electricity.

Planned blackouts were forced and 15% of conservation of electricity is to be ordered to the people and industry.

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### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### Current Energy Situation in Japan 2 : for 1 Year

To make up such shortage, out-put from thermal power station should be increased and additional procurement of Fuels are estimated;

1<sup>st</sup> choice: Thermal Coal (Base-load fuel) \*

2<sup>nd</sup> choice: LNG 9.9 – 12.2 million ton increase from FY2009

3<sup>rd</sup> choice: Oil 140-160 thousand B/D increase from FY2009

**LPG will make LNG's requirements up.**

\* Thermal Coal is base-load fuel and some power stations in Tohoku and Kanto were out of operation due to the earthquake/tsunami, consumption of coal might be reduced with 6.3-7.5 million ton from FY2009 level.

(figures are estimated by EEIJ) 28

### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### Current Energy Situation in Japan 3 : Nuclear

54 Nuclear Power Plants (Capacity 49GW) in Japan.

On March 11, before earthquake;

35 reactors in operation, 19 shut-down

At this moment;

19 reactors in operation, 35 shut-down

#### Big Concerns:

The possibility of extended periodical examinations may in the worst case result in no nuclear plants to be in operation this coming spring.

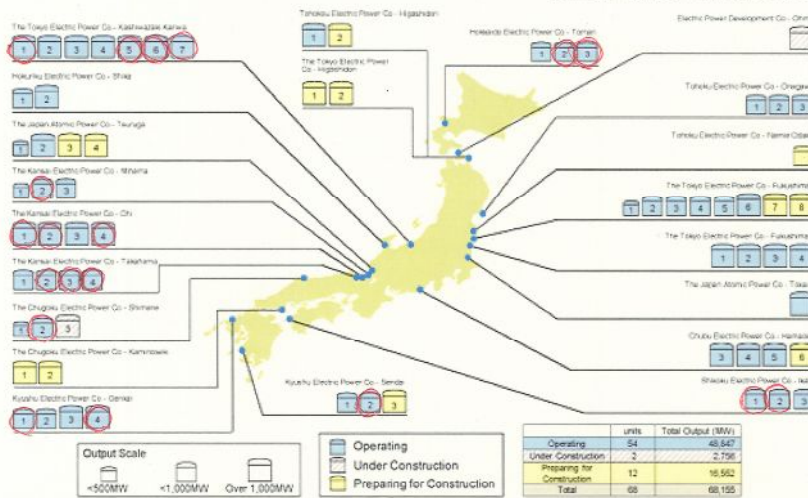
### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### Nuclear Power Plants in Japan

*19 reactors in operation*

(Commercial Plants, as of the end of March 2010)



### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### Future Energy Situation in Japan 1 :

Current “Basic Energy Plan” will be revised in early 2012 with a white slate reflecting dramatic change of Energy Situation since Fukushima NPS’s accident on March 11.

Current Basic Energy Plan was established June 2010, and planned to be revised in 2013.

#### High light of current Basic Energy Plan:

##### **Zero-emission Power** (Renewable Energy + Nuclear)

FY2007:	34%	(9% + 26%)
2030 estimate:	70%	(20% + 50%)

Nuclear reactors are planed to be constructed 9 by 2020, more than 14 by 2030.

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### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### Future Energy Situation in Japan 2 :

We have big troubles to have a solution for:

- ⇒ Replacement of Nuclear
- ⇒ Stable Energy/Electricity Supply / Safety
- ⇒ Low Carbon Society/Zero-emission energy

Japanese Government established several committees for the Growth and Revival strategies and Energy/Environment program etc. in June, last week. (in the Cabinet and in the METI)

#### **Main Discussions points;**

- \* Conservation , \*Renewable Energy, \*Resources & Fuel,
- \* Electric distribution system, \*Nuclear, \*Energy & Environment

#### **On other points, from METI :**

- \* 3E (Energy, Economics, Environment) + S (Safety) \*New

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### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy

#### Future Energy Situation in Japan 3 :

It is obvious that to achieve;  
Environment, Economics and Stable Supply  
at the same time without contribution of  
Nuclear is almost impossible.

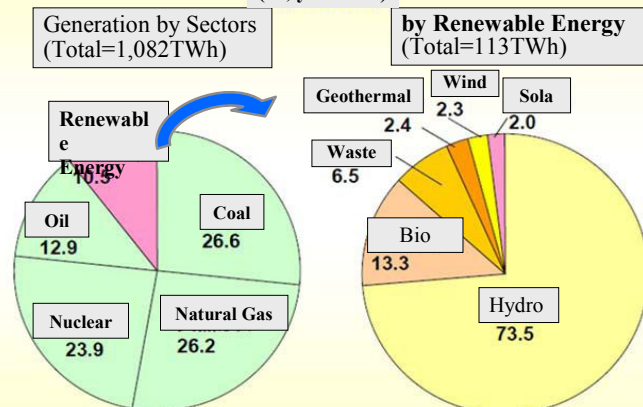
Even the cabinet member considers that  
“20% of electricity from renewable energy by 2020 is doubtful”  
when Prime Minister announced.

Currently, 73.5% of Renewable energy in Japan is from Hydro.

### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy

#### Power Generation by Sectors in Japan

(%, year2008)



### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### Future Energy Situation in Japan 4:

The discussions are just started and each committee is expected to have a primary report sometime in summer and the final reports in the end of the year.

These will be reflected to the “**New Basic Energy Plan**” to be established early 2012.

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### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### Future Energy Situation in Japan 5:

LPG can not be a major player, but may contribute to the “**New Energy Basic Plan**” with its unique Characters. (Clean, Easy, Efficient)

Character 1: Clean Energy ⇒ “Low Carbon Society”

Character 2: Easy to transportation (no grid/pipe-line required)  
⇒ good for Japan (mountain side and islands)  
⇒ Fuel Cell, Cogeneration, Gas-engine

Infrastructure is already established.

Character 3: Reliable & efficient in a crisis & emergency.  
Easy to storage

Character 4: Easy to collaborate with other energy sources such as renewable energy.

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### ③ LPG may contribute to the current Energy Situation and toward New Energy Policy



#### Future Energy Situation in Japan 6:

Please give us your ideas and opinions.

Why don't you come over to see the outcomes of such discussions and how we have recovered from the disaster by yourself in TOKYO early next year!!

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### International LP Gas Seminar in Tokyo



We welcome all of you to our  
“17th International LP Gas Seminar 2012 Tokyo”

**Date: February 23-24, 2012**

**Place: Daiichi Hotel Tokyo**

**No admission fee, but prior “Registration” is required.**  
(The details will be announced early 2012)



(Japanese Government, METI is the sponsor)

“16th International Seminar”  
on Feb.24-25, 2011  
515 attendees (incl. 123 overseas)



(Mr. Otto was Key Note Speaker this year)

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***“The Wild Cherry Tree is Symbolic of the Spirit and  
Pride of the People of Japan. Blooming in the  
Spring with all its Natural Beauty and Splendor.***



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**Thank you very much !!**

**We welcome any feedbacks, suggestions  
or questions from you.**

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