

Kawasaki's Activities in Russia

Japan–Russia Energy and Environment Dialogue
in Niigata

October 30, 2014

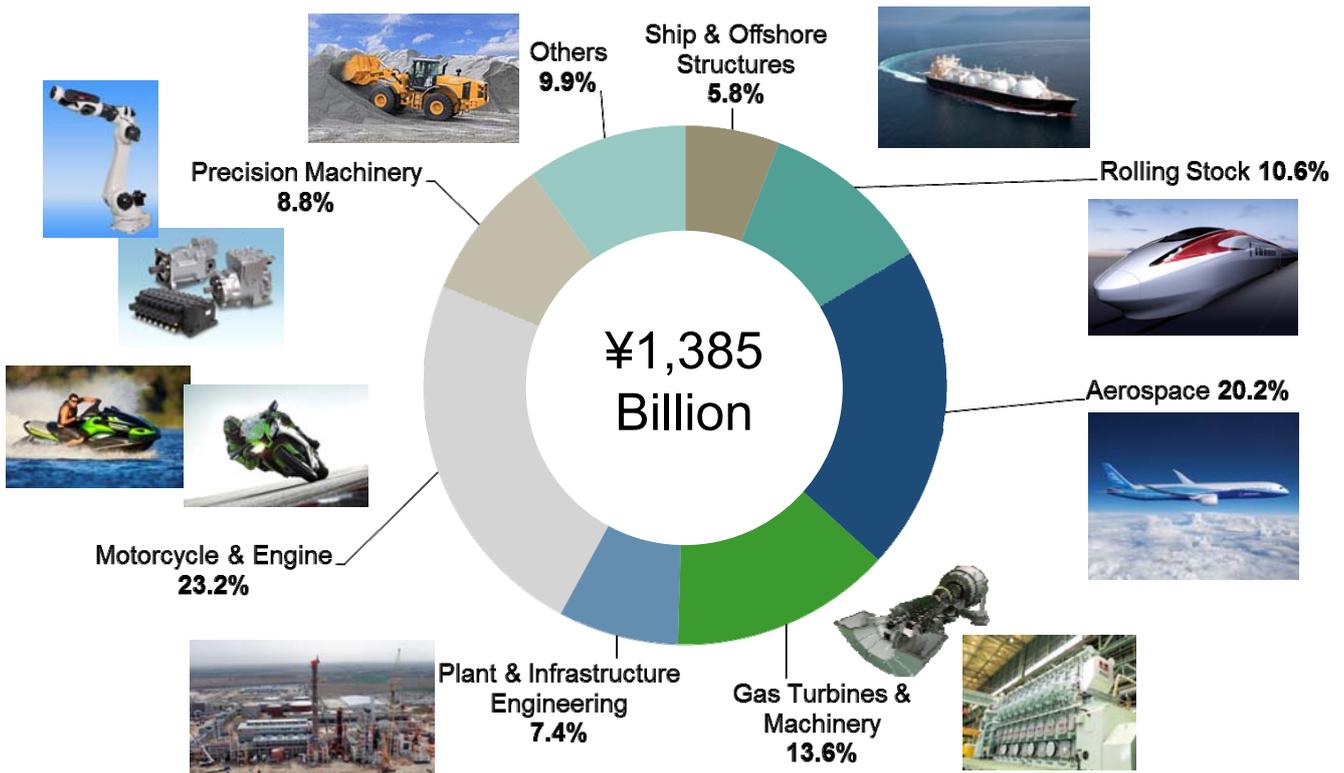


Co2 Free Hydrogen



Gas Turbine Generator

Net Sales Business Segment (Year ended March 31, 2014)



KAWASAKI GREEN Gas Turbine Generators

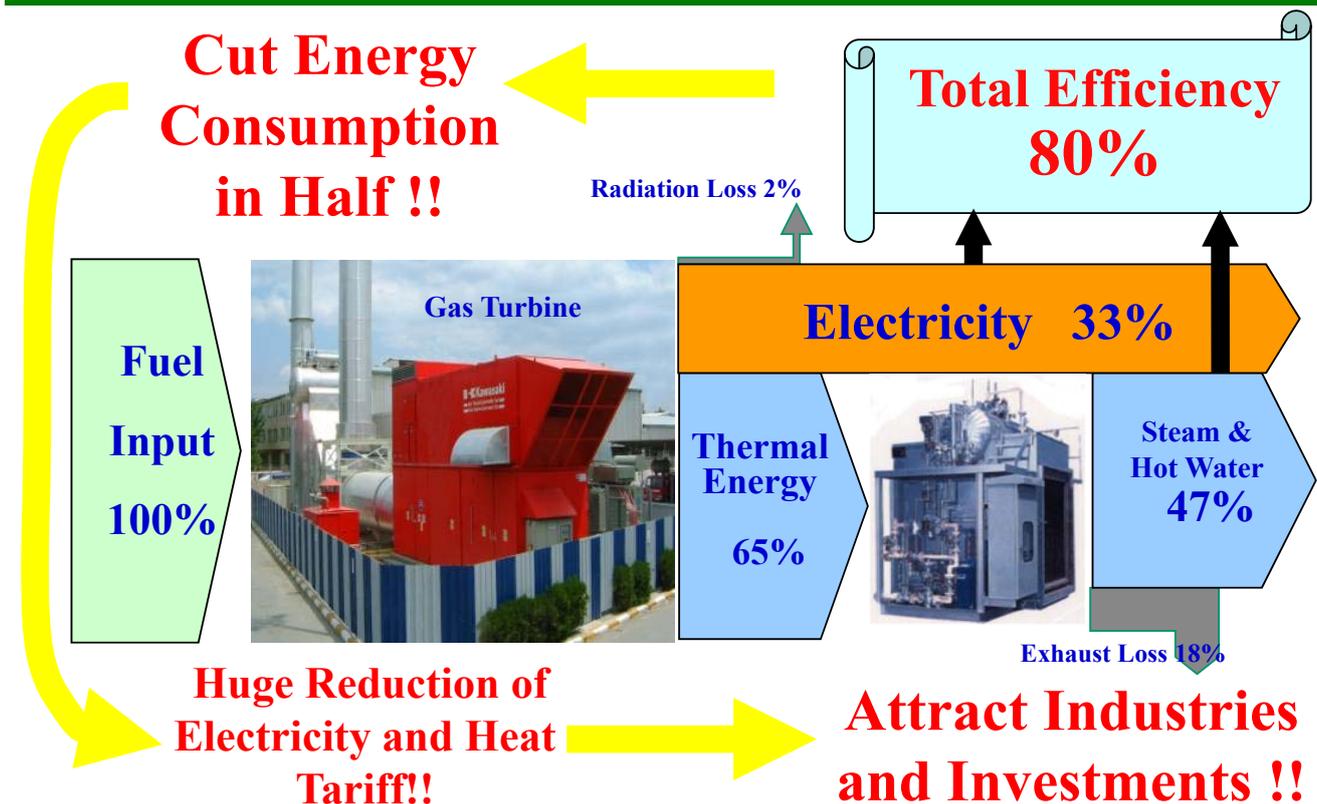
World leading small & medium sized Gas Turbine Generator Maker

FEATURES

- Own and original technology.
- Higher Energy Efficiency
- Lower Emission (cleaner exhaust gas)
- Easy Maintenance (Horizontal Sprit Casing, etc.)
- Long Maintenance Intervals
- High reliability



Kawasaki Cogeneration System

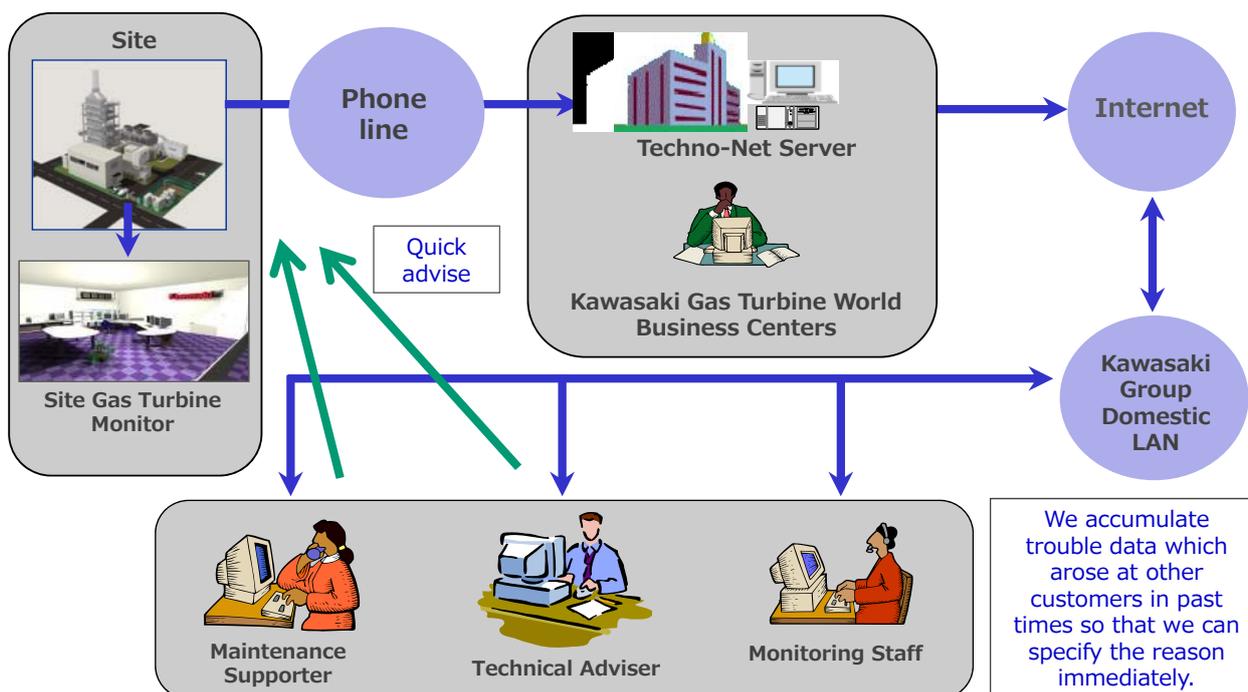


Gas Turbine Generator – Line up

Model	Electricity (ISO Baseload)	Heat (Estimated)	
GPB15D	1,490 kWe	2.9 GCal	5 units of GPB17D will be installed at Gas Pipeline Compressor Stations in Russia
GPB17D	1,690 kWe	2.9 GCal	
GPB70D	6,740 kWe	9.4 GCal	7 units of GPB70D are installed in Russkiy island for Vladivostok APEC 2012 
GPB80D	7,440 kWe	9.4 GCal	
GPB180D	18,420 kWe	23.0 GCal	New model of 2012: <u>World highest power generation performance</u> in the category of 30 MW class gas turbine
GPB300D	30,000 kWe	38.6 GCal	

24 hrs Techno-Net System

We are monitoring gas turbine generator's operation condition 24 hours .
This system helps timely action for restoration and prevent unexpected troubles.



APEC SUMMIT 2012

Main Central Site
7,000kW x 5



Oceanarium
7,000kWx 2



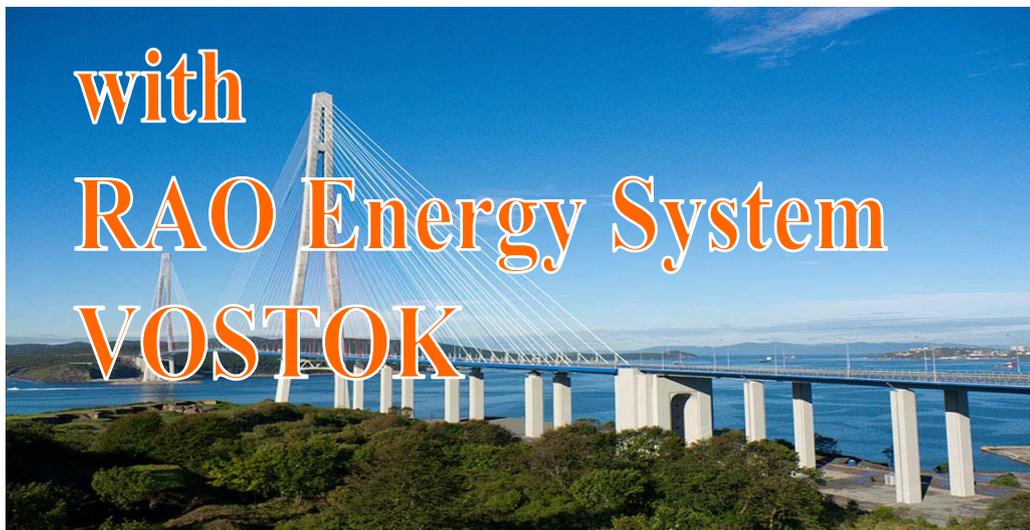
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Collaboration in Far East

**Heat & Power Cogeneration Plant Construction
Collaboration
along with Far East Gas Pipeline**



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RAO Energy System Vostok

Cooperation Agreement signed between 4 parties (RAO ESV, Municipalities, Sojitz and Kawasaki) at the 6th Japan-Russian Investment Forum in Tokyo on March 19, 2014 for

Construction of two Pilot Cogeneration Plants

in Vladivostok and Artem City

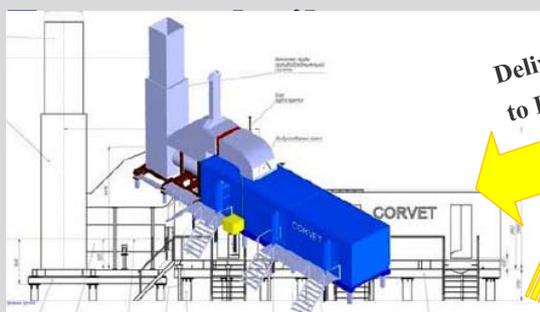
and the tender for engineering of the pilot plants has been announced in June 2014.



Collaboration with Energotechnika

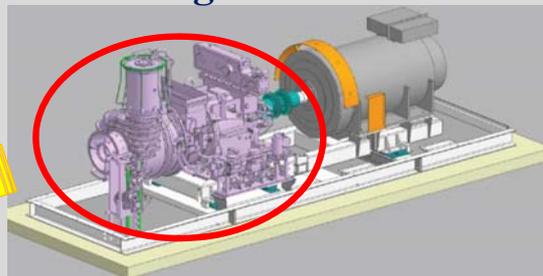
Local packaging of Kawasaki Gas Turbine M1A-17D, selected as “Program of Science & Technology Cooperation 2012-14” by OJSC Gazprom and Japanese Agency for Natural Resources and Energy

Packaged by Energotechnika



Delivered to Russia

1700KW gas turbine



- High Performance
- Long maintenance interval

Supply to Gazprom

- Apply for gas pipeline booster stations of Gazprom
- 5 units ordered as pilot Expect to consecutive order of 20 units /year
- **Local packaging of 7 MW class for Gazprom is under discussion**

CO2 Free Hydrogen which contributes to Global Environment is one of the promising Next-Generation Energies

Energy Surplus Country



Hydro



Wind



Solar

CO2 Free Power

Hydrogen
Production &
Liquefaction

Liquefied
Hydrogen
Storage &
Transport

Energy Demand Country

Industrial
Use



Power
Gen.



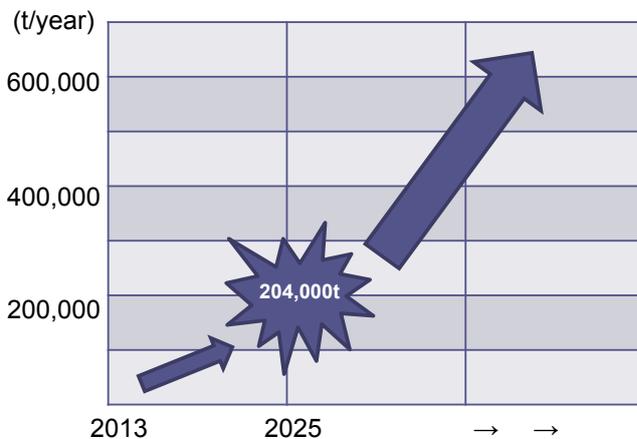
F.C.V.



CO2 Free Energy

* The new Strategic Energy Plan, which was adopted in April 2014, states that the Japanese government will strengthen the effort toward realization of hydrogen society.

Expected Demand of Liquid Hydrogen for Fuel Cell Vehicle (FCV) in Japan



2 million FCVs* x 8.5kg/Month x 12Months
= 204,000 tons of Liquid Hydrogen /Year

* Target number proposed by FCCJ
(FCCJ : Fuel Cell Commercialization Conference of Japan)

* 2.7% of vehicles in Japan

Osaka Hydrogen Station H19.8.24. Completed by Kawasaki



所在地：大阪市中央区大手前3丁目1番7号

New Clean Industry for Energy-rich Far East Russia

Export of Clean Energy by Liquid Hydrogen is under PreFS by



РусГидро



RAO ES Vostok



Magadanenergo

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Problem of Magadan Port

Liquid Hydrogen will be transported from Magadan to Japan by sea.



- ◆ At the moment the demurrage time at Magadan Port is approx. 7-14 days.
- ◆ Renovation of Magadan Port is in urgent need.
- ◆ Port operation without demurrage loss is the key factor for success of the project.

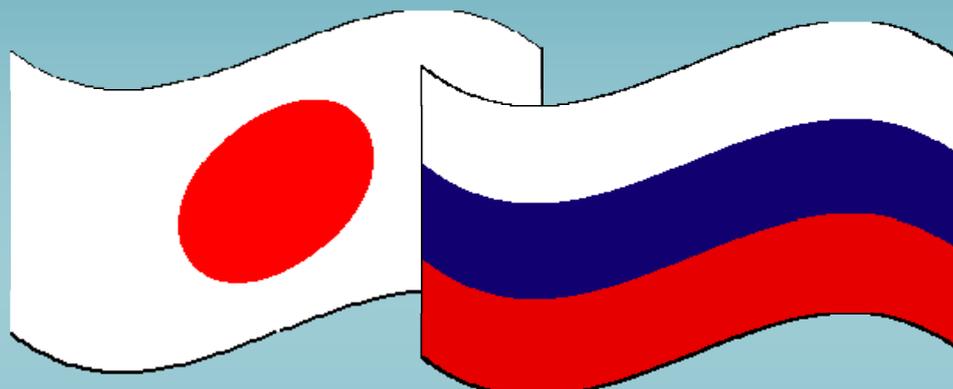
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Локальная установка
комбинированной системы
выработки электроэнергии и
тепла, подходящая для
российских условий

