Initiatives Toward the Environment of Keihin Water Front District

February 15, 2011

Kawasaki City General Planning Bure

Office of Kanagawa Port & Water Fro
Maintenance Promotion

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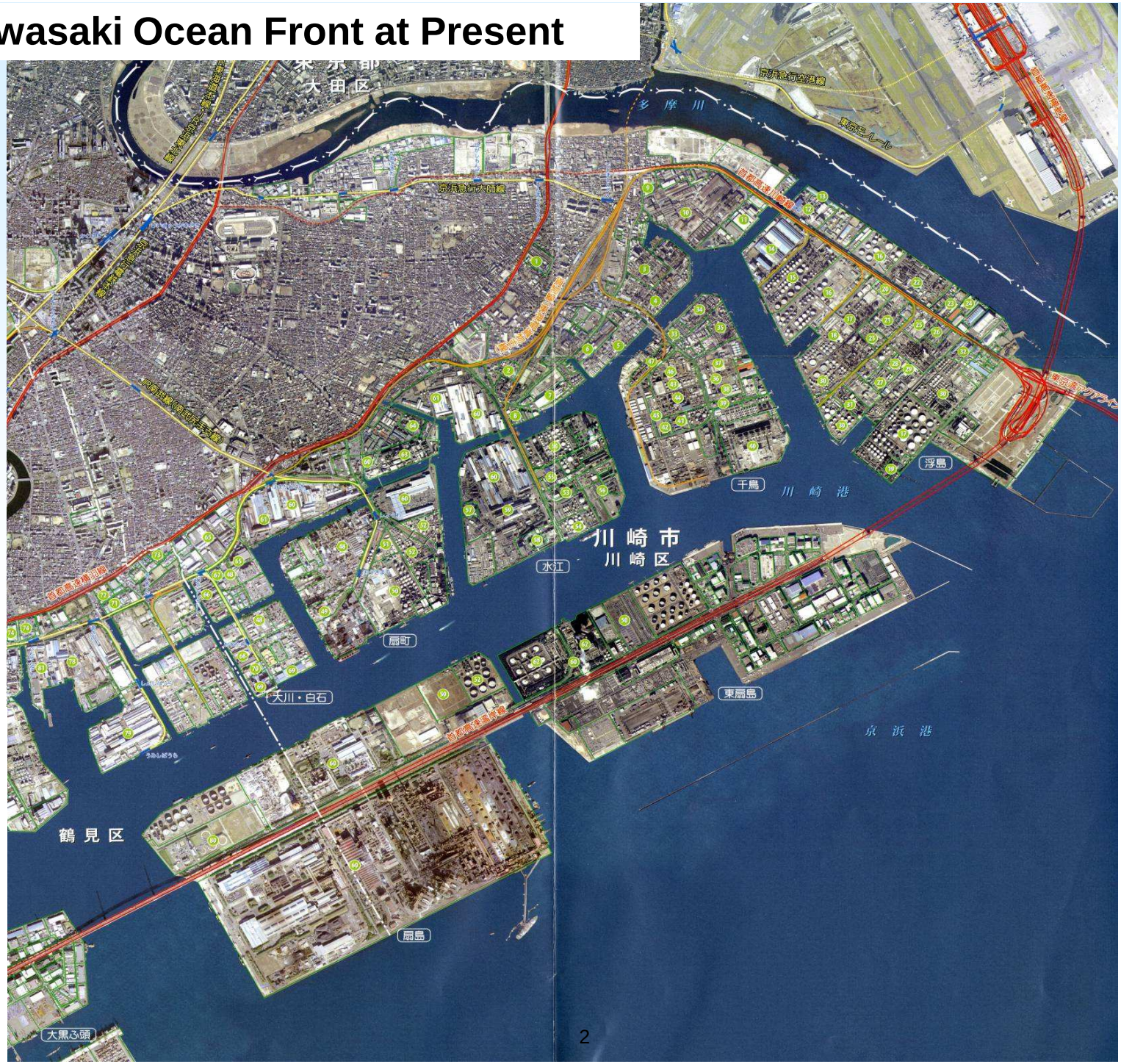
Kawasaki Water Front at the End of Meiji Era

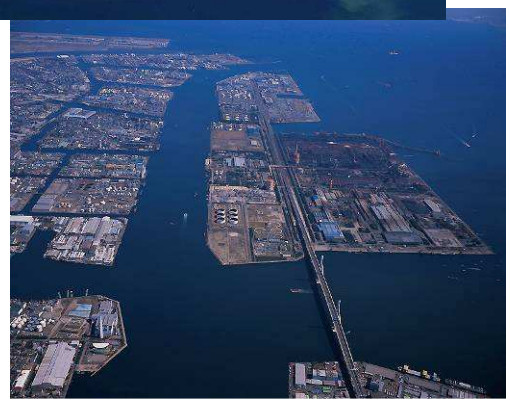
Kawasaki Ocean Front at Present



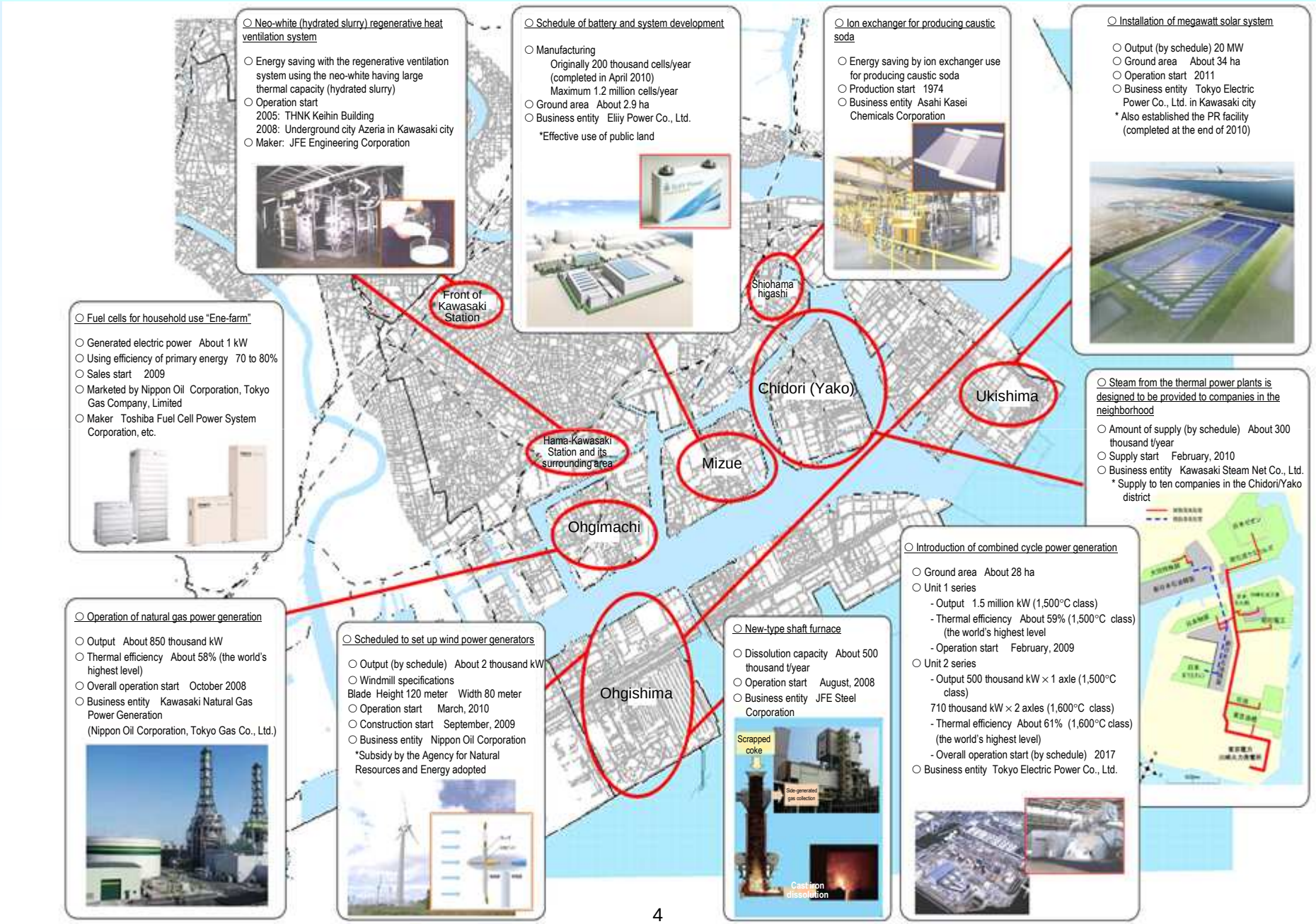
An Initiative that successfully Tackled the Problem of Pollution

Kawasaki Water Front in the 1960's

Kawasaki Water Front at Present



Initiatives toward Environmental Technologies on Kawasaki Water Front (Global environment/ Energy)



○ Neo-white (hydrated slurry) regenerative heat ventilation system

○ Energy saving with the regenerative ventilation system using the neo-white having large thermal capacity (hydrated slurry)
○ Operation start
2005: THNK Keihin Building
2008: Underground city Azeria in Kawasaki city
○ Maker: JFE Engineering Corporation

○ Schedule of battery and system development

○ Manufacturing
Originally 200 thousand cells/year (completed in April 2010)
Maximum 1.2 million cells/year
○ Ground area About 2.9 ha
○ Business entity Eliiy Power Co., Ltd.
*Effective use of public land

○ Ion exchanger for producing caustic soda

○ Energy saving by ion exchanger use for producing caustic soda
○ Production start 1974
○ Business entity Asahi Kasei Chemicals Corporation

○ Installation of megawatt solar system

○ Output (by schedule) 20 MW
○ Ground area About 34 ha
○ Operation start 2011
○ Business entity Tokyo Electric Power Co., Ltd. in Kawasaki city
* Also established the PR facility (completed at the end of 2010)

○ Fuel cells for household use "Ene-farm"

○ Generated electric power About 1 kW
○ Using efficiency of primary energy 70 to 80%
○ Sales start 2009
○ Marketed by Nippon Oil Corporation, Tokyo Gas Company, Limited
○ Maker Toshiba Fuel Cell Power System Corporation, etc.

○ Steam from the thermal power plants is designed to be provided to companies in the neighborhood

○ Amount of supply (by schedule) About 300 thousand t/year
○ Supply start February, 2010
○ Business entity Kawasaki Steam Net Co., Ltd.
* Supply to ten companies in the Chidori/Yako district

○ Operation of natural gas power generation

○ Output About 850 thousand kW
○ Thermal efficiency About 58% (the world's highest level)
○ Overall operation start October 2008
○ Business entity Kawasaki Natural Gas Power Generation
(Nippon Oil Corporation, Tokyo Gas Co., Ltd.)

○ Scheduled to set up wind power generators

○ Output (by schedule) About 2 thousand kW
○ Windmill specifications
Blade Height 120 meter Width 80 meter
○ Operation start March, 2010
○ Construction start September, 2009
○ Business entity Nippon Oil Corporation
*Subsidy by the Agency for Natural Resources and Energy adopted

○ New-type shaft furnace

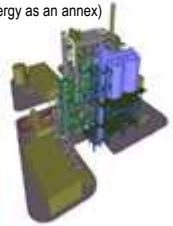
○ Dissolution capacity About 500 thousand t/year
○ Operation start August, 2008
○ Business entity JFE Steel Corporation

○ Introduction of combined cycle power generation

○ Ground area About 28 ha
○ Unit 1 series
- Output 1.5 million kW (1,500°C class)
- Thermal efficiency About 59% (1,500°C class) (the world's highest level
- Operation start February, 2009
○ Unit 2 series
- Output 500 thousand kW × 1 axle (1,500°C class)
710 thousand kW × 2 axles (1,600°C class)
- Thermal efficiency About 61% (1,600°C class) (the world's highest level)
- Overall operation start (by schedule) 2017
○ Business entity Tokyo Electric Power Co., Ltd.

Initiatives Toward Environmental Technologies on Kawasaki Water Front (Resource recycling/waste)

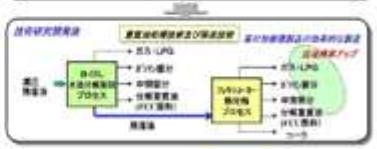
○ Plan the construction of biomass power plant
- ○ Output (by schedule) About 33 thousand kW
- ○ Ground area About 3.2 ha
- ○ Operation start (by schedule) February, 2011
- ○ Construction start September, 2009
- ○ Business entity Kawasaki Biomass Power Generation Co., Ltd. and others Subsidy by NEDO adopted
- ○ Processing facility for providing fuel to be used by the power plants (Establish Japan Bio Energy as an annex)

○ Urban-type cement factory
- ○ Reduction of CO2 by using waste and by-products effectively as the raw fuel for cement
- ○ Reduction of CO2 by manufacturing slug cement for blast furnace
- ○ Business entity DC Co., Ltd.

○ Construction of incinerator with a furnace of dry distillation gasification type
- ○ Waste is turned into gas and burned
- ○ Hazardous substance concentration reduced by 90%
- ○ Amount of exhaust gas reduced by 60%
- ○ Operation start July, 2007
- ○ Business entity Zeon Corporation

○ Development of advanced integrated processing technology for heavy oil
- ○ Resolution facilities that vary from one oil refinery to another are combined for an integrated operation of heavy oil, so that manufacturing of high-value added oil products such as volatile oil is enabled efficiently.
- ○ Business entity Tonen General Sekiyu K.K., Showa Shell Sekiyu K.K. Toa Oil Co., Ltd.

○ Soil purification plants
- ○ Business entity Shimizu Corporation

(Ohgimachi)
- ○ Amount of processing 40 t/h
- ○ Operation start September, 2002

(Shiraishi) Exclusively for dioxin
- ○ Amount of processing 5 t/h
- ○ Operation start May, 2009

Shiohama higashi

Ukishima

Asano

Mizue

Shiraishi

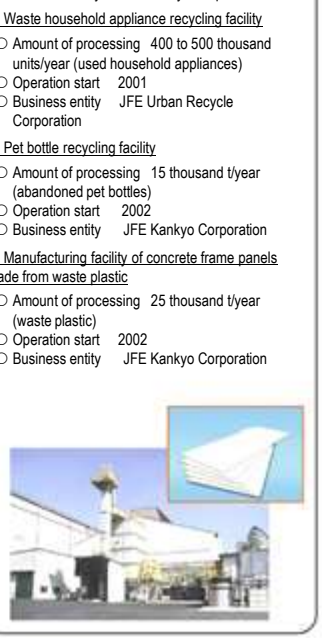
Ohgimachi

○ Waste plastic blast furnace reduction facility
- ○ Amount of processing 25 thousand t/year (waste plastic)
- ○ Operation start 2000
- ○ Business entity JFE Kankyo Corporation

○ Waste household appliance recycling facility
- ○ Amount of processing 400 to 500 thousand units/year (used household appliances)
- ○ Operation start 2001
- ○ Business entity JFE Urban Recycle Corporation

○ Pet bottle recycling facility
- ○ Amount of processing 15 thousand t/year (abandoned pet bottles)
- ○ Operation start 2002
- ○ Business entity JFE Kankyo Corporation

○ Manufacturing facility of concrete frame panels made from waste plastic
- ○ Amount of processing 25 thousand t/year (waste plastic)
- ○ Operation start 2002
- ○ Business entity JFE Kankyo Corporation



○ Facility for turning waste plastic into raw material of ammonia
- ○ Amount of processing 64 thousand t/year (waste plastic)
- ○ Production amount 58 thousand t/year (ammonia)
- ○ Operation start 2003
- ○ Business entity Showa Denko K. K.

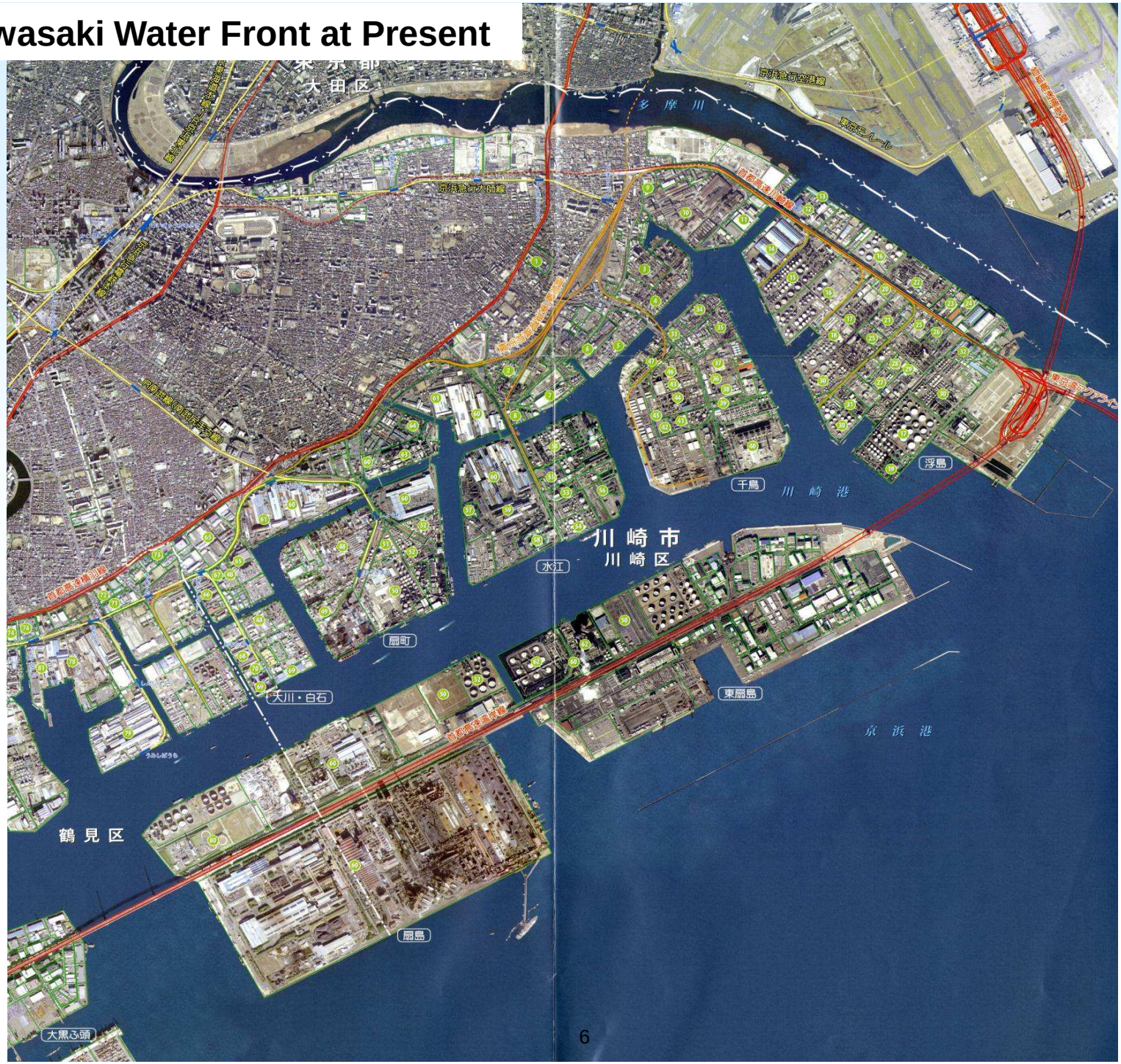
○ Refuse paper recycling facility
- ○ Amount of processing 81 thousand t/year (refuse paper)
- ○ Production amount 54 thousand t/year (for toilet paper)
- ○ Operation start 2002
- ○ Business entity San-Ei Regulator Co., Ltd

○ Pet to pet recycling facility
- ○ Amount of processing 27.5 thousand t/year (abandoned pet bottles)
- ○ Production amount 23 thousand t/year (resin for pet bottles)
- ○ Operation start 2004
- ○ Business entity Petrefinetechnology Co., Ltd.

Observation of water front district (May, 2008)
(from left)
The President of the People's Republic of China Hu Jintao
Mayor of Kawasaki Takao Abe

Observation of water front district April, 2009
(From left)
People's Republic of China
The Central Politburo of the Communist Party of China
Standing committee member Li Changchun
Mayor of Kawasaki Takao Abe

Kawasaki Water Front at Present



Toward Establishment of Kawasaki Environment Research Institute in Tonomachi 3-Chome District

- Establishment of the General Environment Research Institute -

■ **The Kawasaki Environment Research Institute was established in Tonomachi 3-Chome district in Kawasaki-ku which is adjacent to Haneda Airport, as a hub for leading international competition**

○ Promoting environmental policies in a better-planned and more scientific manner to realize a low-carbon society and address regional environmental issues

○ Promoting comprehensive research on the environment in liaison with Japan's National Institute for Environmental Studies, universities and private sectors having advanced environmental technologies.

Five functions introduced in the Kawasaki Environment Research Institute

◆ Function 1
Research aiming at Coexistence of City and Industry
(Collaborative joint research with industry, universities, the public sector and citizens)

◆ Function 2
Promotion of international contribution by Kawasaki's outstanding environmental technologies

◆ Function 3
Collection and dissemination of information regarding Kawasaki's outstanding environmental technologies

◆ Function 4
Monitoring, survey and research for further environmental improvements and prevention of environmental pollution

◆ Function 5
Environmental education and learning in collaboration with diverse players

Toward Establishment of the Kawasaki Environment Research Institute in Tonomachi 3-chome District

- Establishment of General Environment Research Institute -

■ Dissemination of the cutting-edge environmental technologies as the hub of the environmental field

○ Disseminate information on the introduction of the latest environmental technologies or sample exhibitions

○ Promote visualization of environmental technologies, for instance, the effect on the reduction of CO2 emissions

○ Hold events at which visitors can see and feel the environmental technologies. One hub for eco tours on the Water Front

Environment-friendly design

<On Construction >
◆Double outer wall to cut thermal load
◆A well-hole style as an environmental device

<Adoption of leading-edge green technologies>
◆ Use of BEMS
◆ Automated control of illumination and air-conditioning

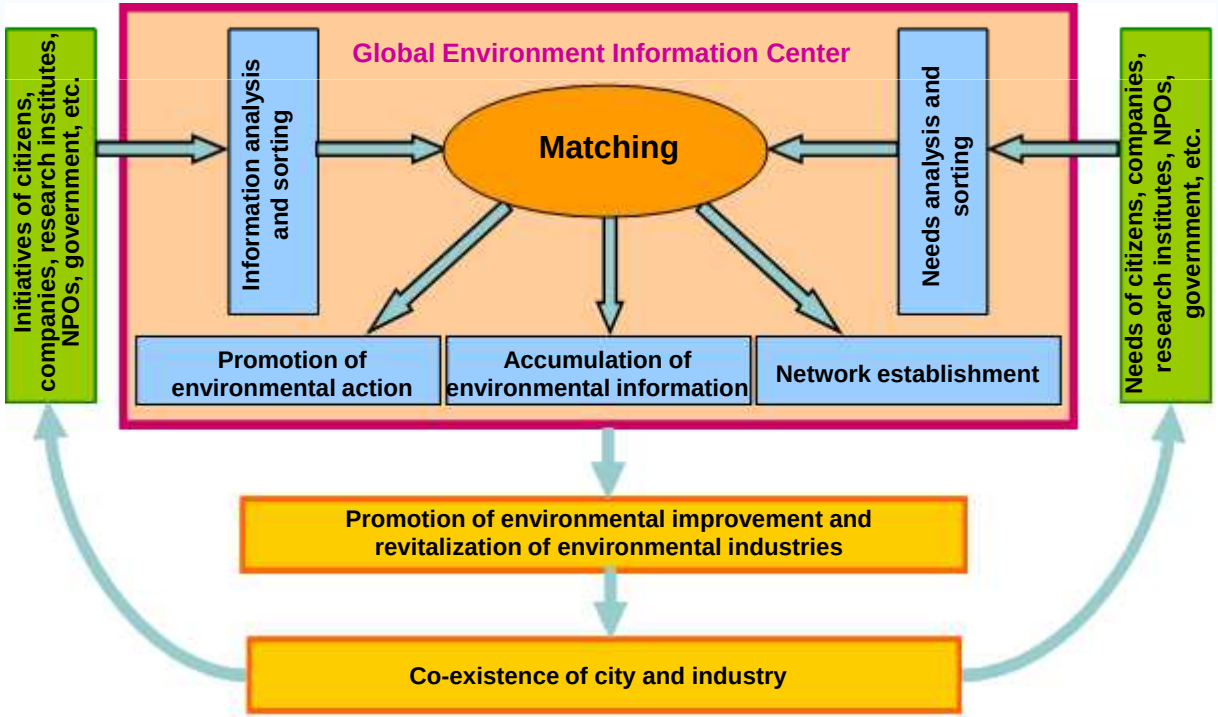
<Use of natural energies>
◆ Photovoltaic (PV) power generation
◆ Use of solar heat and underground heat

Toward Establishment of the Kawasaki Environment Research Institute in Tonomachi 3-chome District

- Establishment of general environmental Research Institute-

Initiatives toward the establishment
(Activities of the Environment Technology Information Center)

- In advance to the establishment of Kawasaki Environment Research Institute, the City of Kawasaki established the Global Environment Information Center in 2008.
- Initiatives toward the coexistence of the city and industry, such as the collection and dissemination of information on environmental technologies, joint research with the industry, academia, the private sector, citizens and international collaborative projects, are promoted.



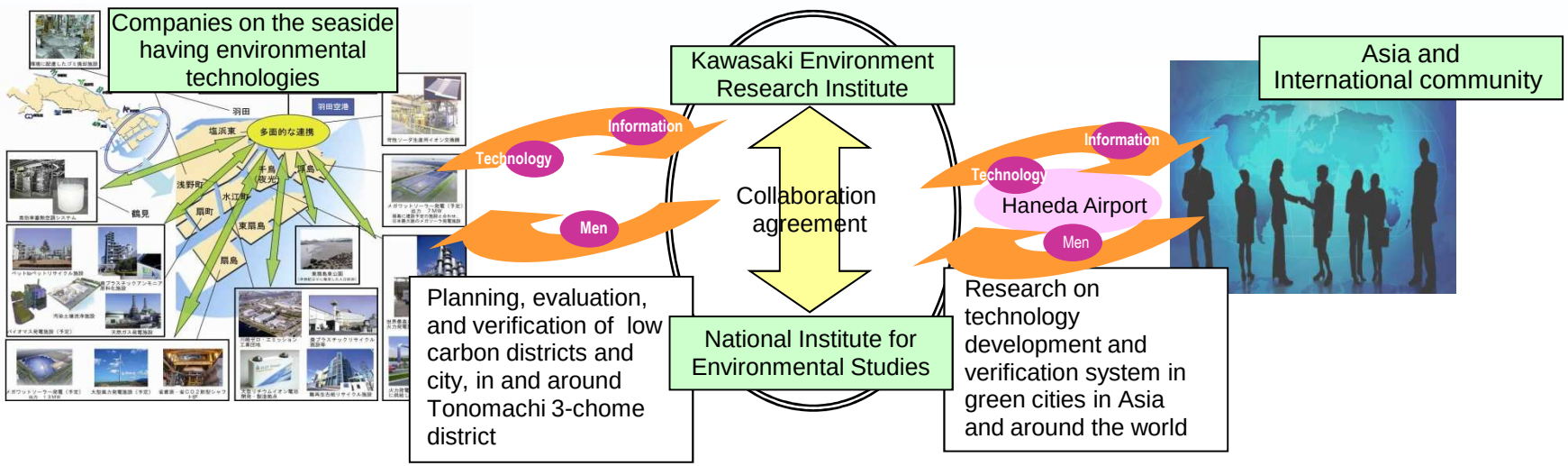
Kawasaki Green Innovation linked to the Idea of Creating an International Hub of Cutting-Edge Technologies

■ In linkage with the idea of creating a world-class hub for competitive technologies and R & D on environmental technologies is further promoted with the Kawasaki Environment Research Institute as the core

○ Make contribution to the sustainable development of Kawasaki as a low-carbon city, by promoting R & D with the fields for which the advanced environmental technologies have been accumulated

○ Disseminate *A Model of Co-Existence of City and Industry* as a package from Kawasaki to contribute to the sustainable development of the Earth as a member of the international society

Research for the methods of environmental technology information, environmental technology evaluation and environmental city planning by the green innovation network (draft)



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