Japan's policy on Smart Communities

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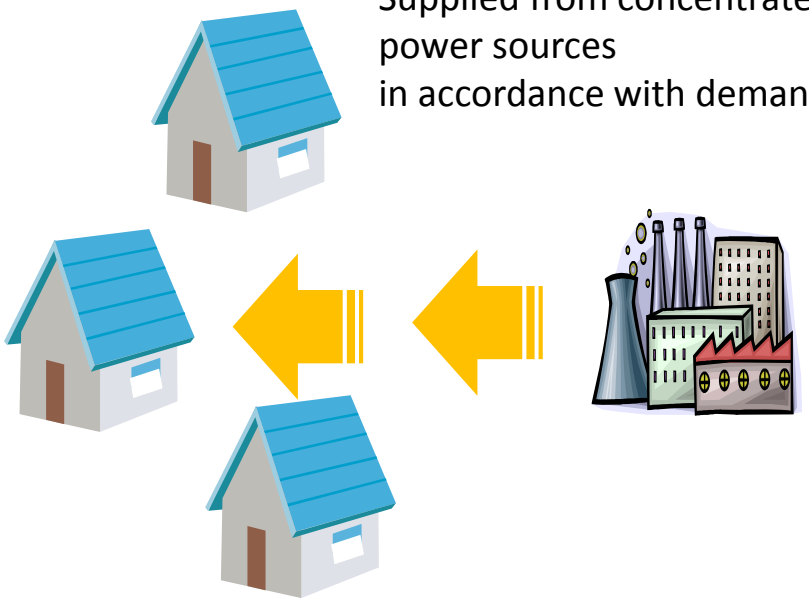
Structural Changes in Demand and Supply of Energy by Smart Communities

経 済 産 業 省
資源エネルギー庁

Traditional energy system

Unidirectional type

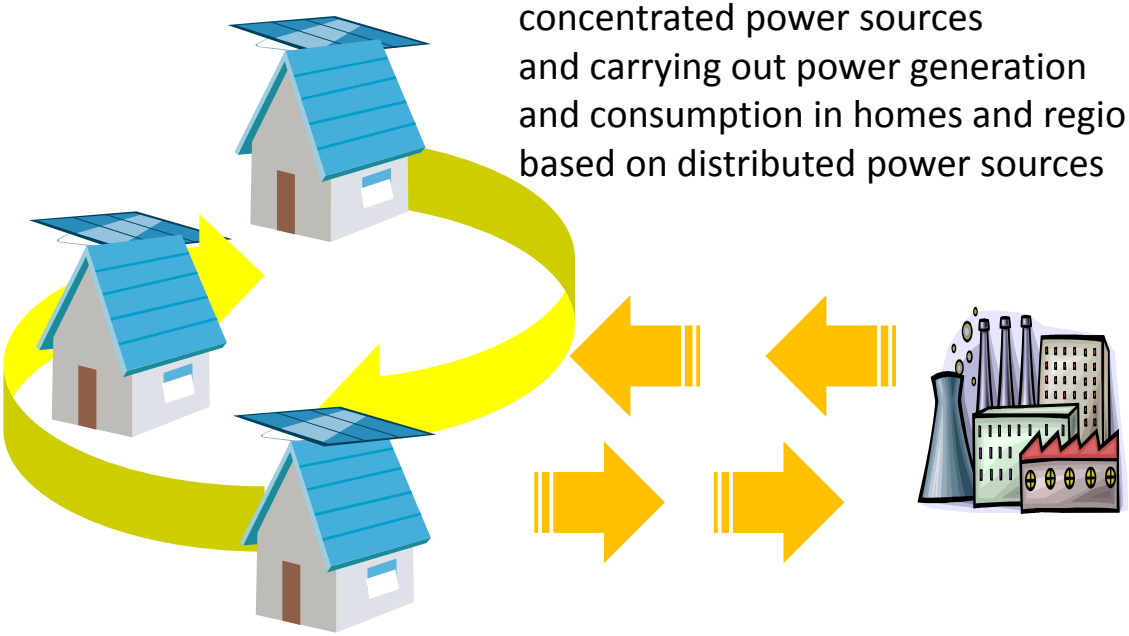
Supplied from concentrated power sources in accordance with demand



Future energy system

Bi-directional type

Supply and demand are balanced, based on receiving supply from concentrated power sources and carrying out power generation and consumption in homes and regions based on distributed power sources



Energy Situation and Smart Communities After the Disaster

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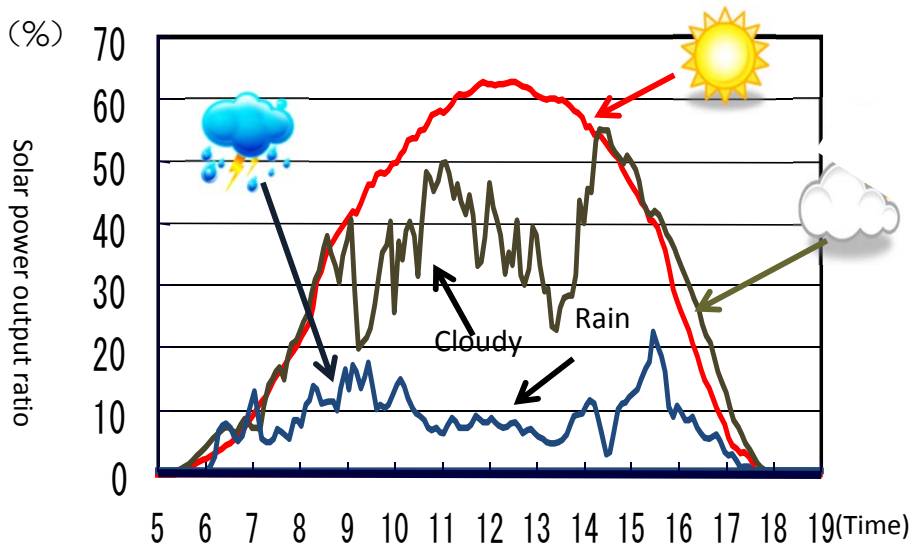
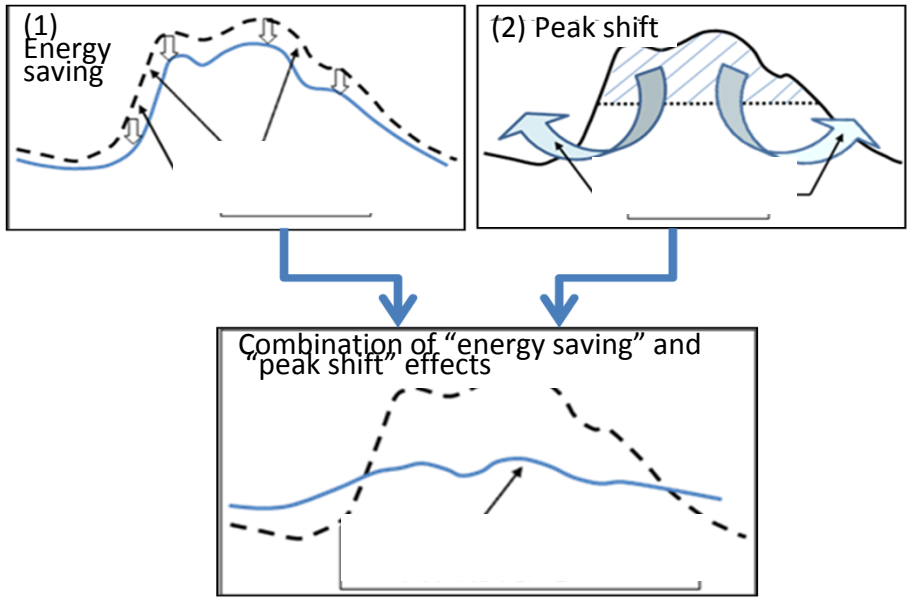
1. Large-scale induction of renewable energy, the quality of electricity becomes a problem



2. Saving energy and cutting back during peak periods becomes issues.



3. Technological development for efficient use of energy /energy management based on ICT technology

V2H

Toshiba

Sharp

Storage battery

Demonstration of Smart Communities in Japan(2011-2014)

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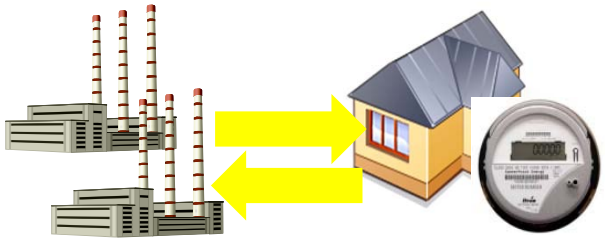
Housing complex

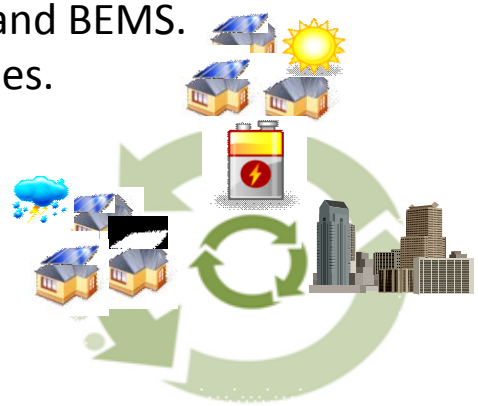
・700 households and HEMS
・Consulting business about saving energy.



Keihanna Science City

Wide-area metropolis

・4000 households and HEMS
・10 large-scale building and BEMS.
・Multiple storage batteries.

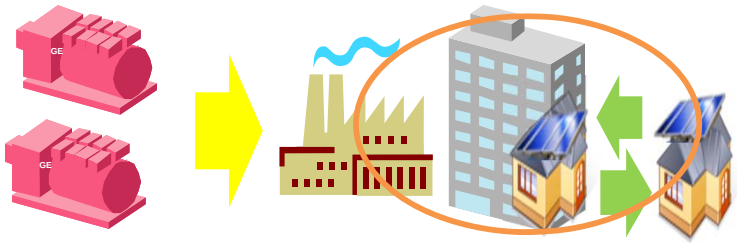


Yokohama City

Kitakyushu City

Designated supply area

・ Power is supplied by Nippon Steel & Sumitomo Metal Corporation.
・ Dynamic pricing system for 180 households.



Toyota City

Separate housing

・local production for local consumption
・67 households equipped with solar panels, household fuel cells , storage batteries.
・Advanced transportation system(EV, PHV)

Components of Smart Community

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Component 1: Energy Management System

Power Company A

Power Company B

Power Company Z

CEMS

HEMS

BEMS

FEMS

Component 2: Communication Interface

PV、Cogeneration、FC

energy saving device
storage battery

Component 3: infrastructure for utilizing Big Data

Component 4: Demand Response

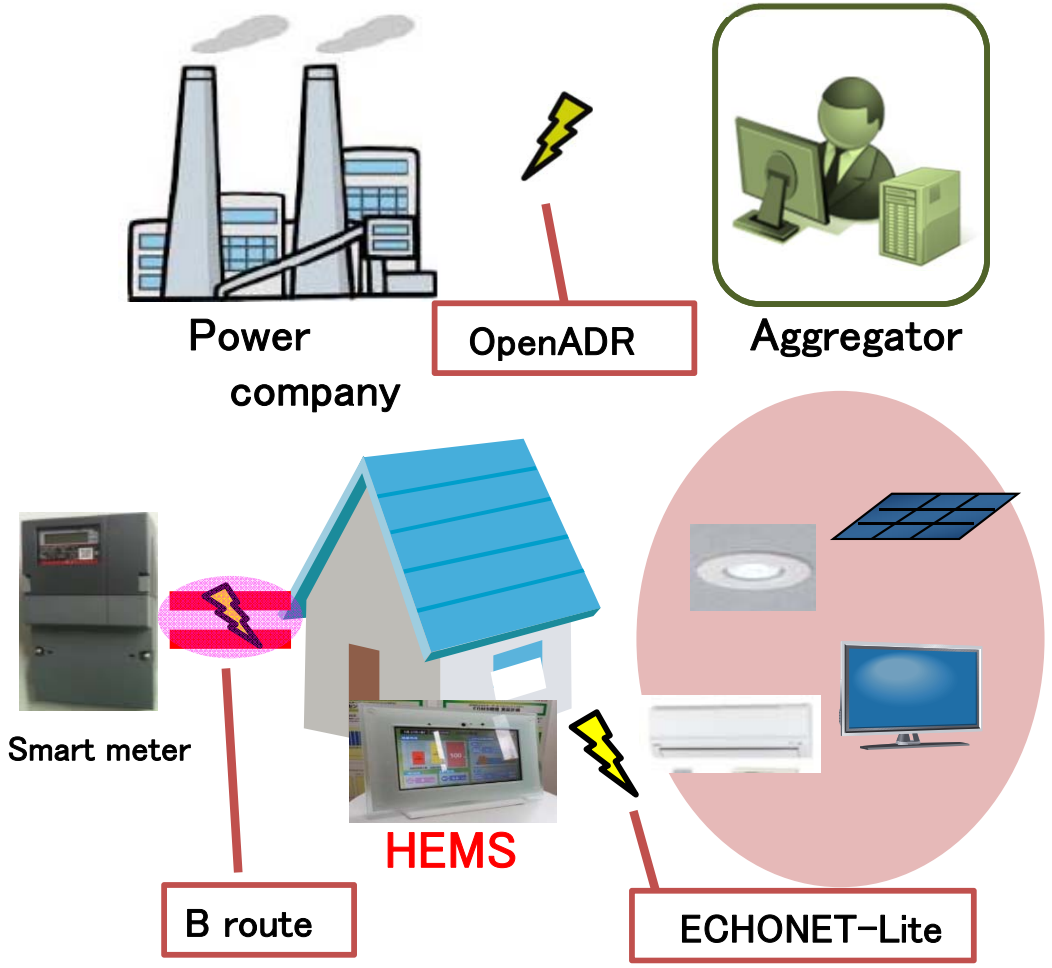
Component 5: life Support Services

Establishment of core technologies

Ex1.Development of CEMS

CEMS at Kitakyushu（Fuji electric）

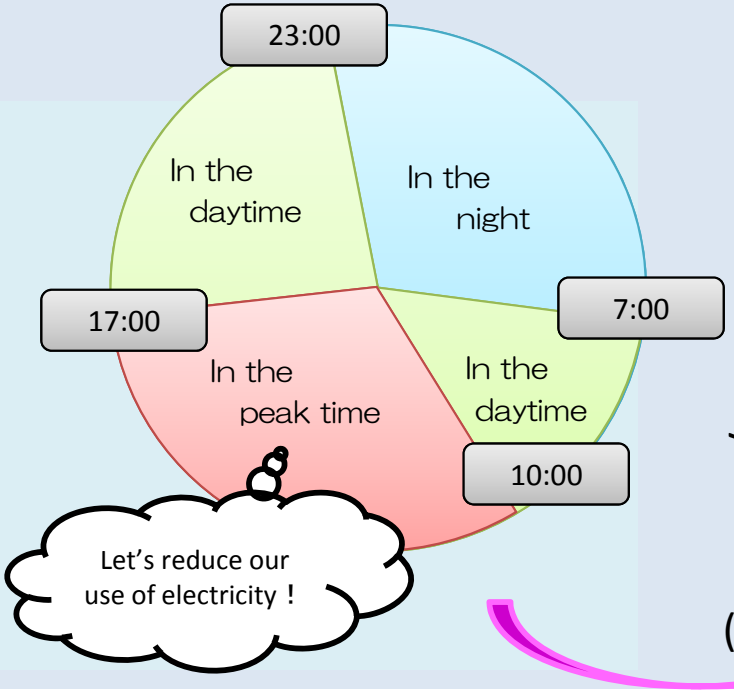
Ex2. Establishment of standard interface

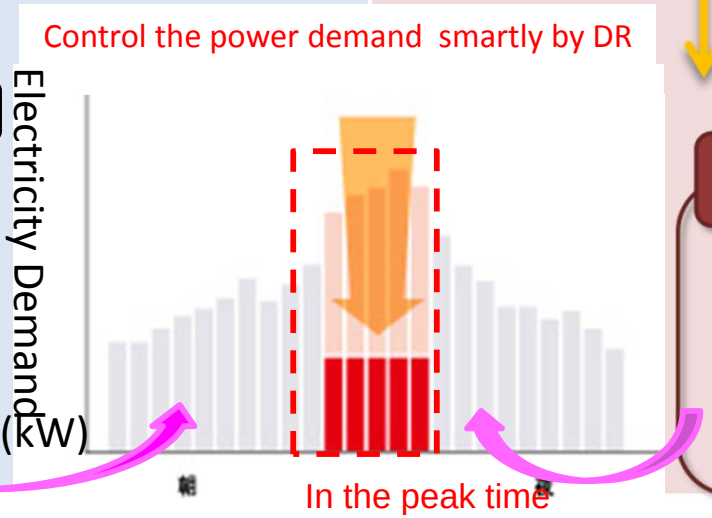


Demand Response

1. Demand response for residential (Price-based DR)

The Electricity Market Reform enables power companies to set the electricity prices flexibly.

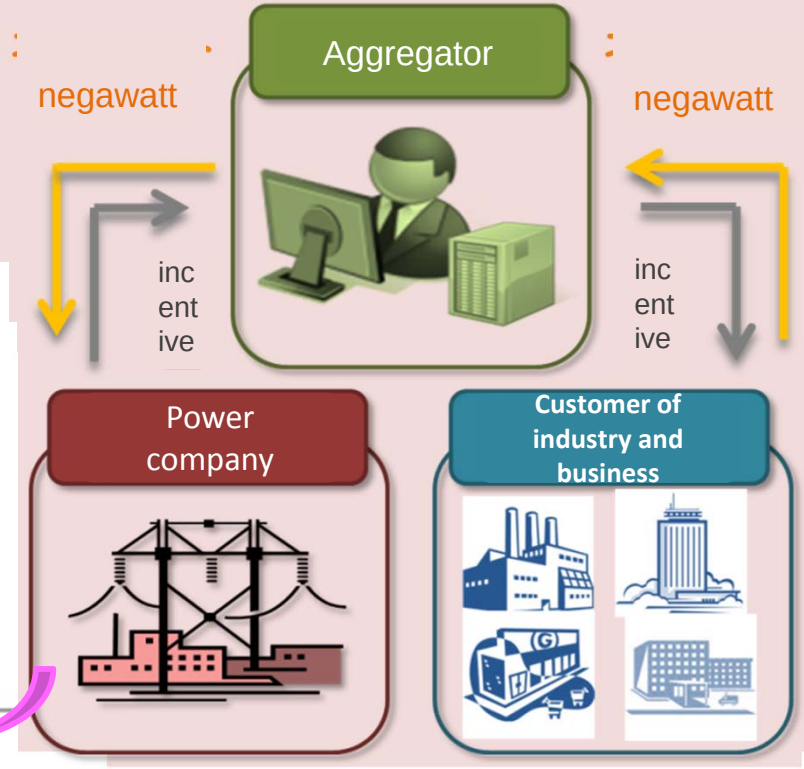




2. Demand response for industry and commercial (Incentive-based DR (Negawatt trading))

By the end of this March, METI will set the guideline to trade negawatt.

Through the Electricity Market Reform, trading chance is expected to increase.



Price-based DR

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Kitakyushu City

	Summer of 2012		Winter of 2012		Summer of 2013	
Electricity price	Peak cut effect	Statistical significance	Peak cut effect	Statistical significance	Peak cut effect	Statistical significance
TOU	–	–	–	–	–	–
CPP＝50yen	−18.1%	5%level	−19.3%	1%level	−20.2%	1%level
CPP＝75yen	−18.7%	5%level	−19.8%	1%level	−19.2%	1%level
CPP＝100yen	−21.7%	1%levlel	−18.1%	1%level	−18.8%	1%level
CPP＝150yen	−22.2%	1%level	−21.1%	1%level	−19.2%	1%level

Keihanna Science City

	Summer of 2012		Winter of 2012		Summer of 2013	
Electricity price	Peak cut effect	Statistical significance	Peak cut effect	Statistical significance	Peak cut effect	Statistical significance
TOU（premium:20yen）	−5.9%	1%level	−12.2%	1%level	−15.7%	1%level
CPP（premium:40yen）	−15.0%	1%level	−20.1%	1%level	−21.1%	1%level
CPP（premium:60yen）	−17.2%	1%level	−18.3%	1%level	−20.7%	1%level
CPP（premium:80yen）	−18.4%	1%level	−20.2%	1%level	−21.2%	1%level

Thank You For Your Attention!

Japan Smart City Portal

http://jscp.nepc.or.jp/en/