



“Climate Change Problems in Asia”

Smart Energy Network; opportunity for GHG reduction

Presentation for IAEE

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Environment issues in Asia

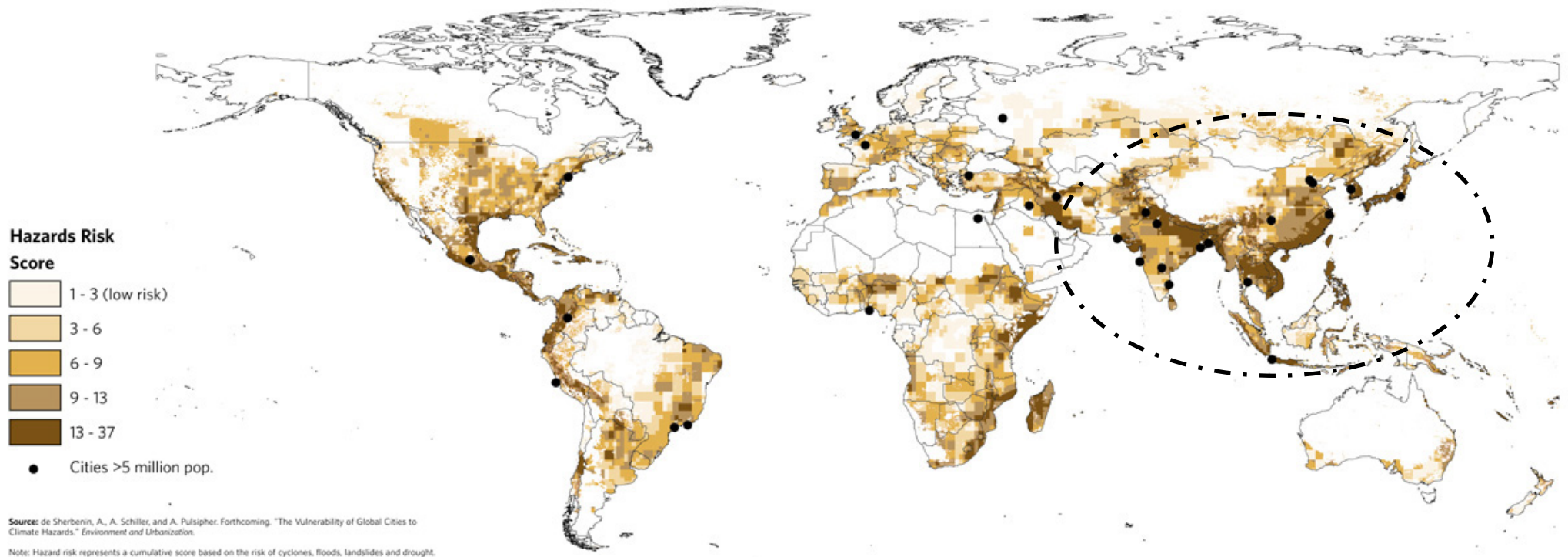
- Air quality (Sox, NOx, PM) regional
- Water quality regional
- Waste treatment regional
- Global warming (GHG, CO2) global



Large Cities in Relation to Current Climate-related Hazards

Source; state of world population 2007” report, USFPA (the United Nations Population Fund)

Figure 7: Large Cities in Relation to Current Climate-related Hazards



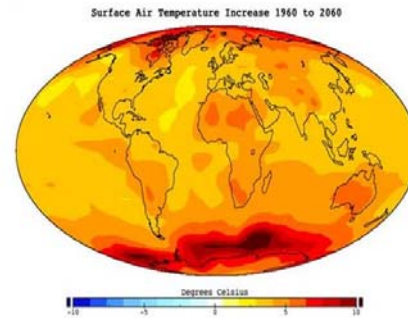
Source: de Sherbenin, A., A. Schiller, and A. Pulsipher. Forthcoming. "The Vulnerability of Global Cities to Climate Hazards." Environment and Urbanization. Note: Hazard risk represents a cumulative score based on the risk of cyclones, floods, landslides and drought.

<http://www.unfpa.org/public/home/about>

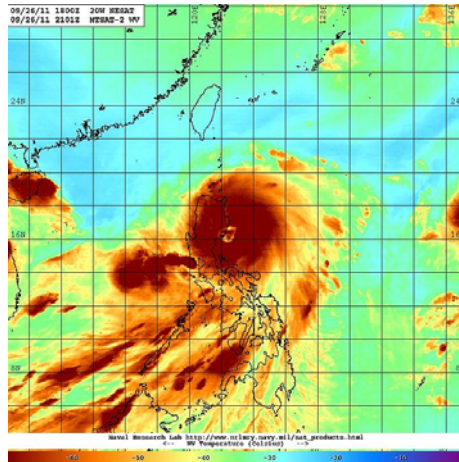
Global warming related extreme climate is devastating



Flood in Thailand



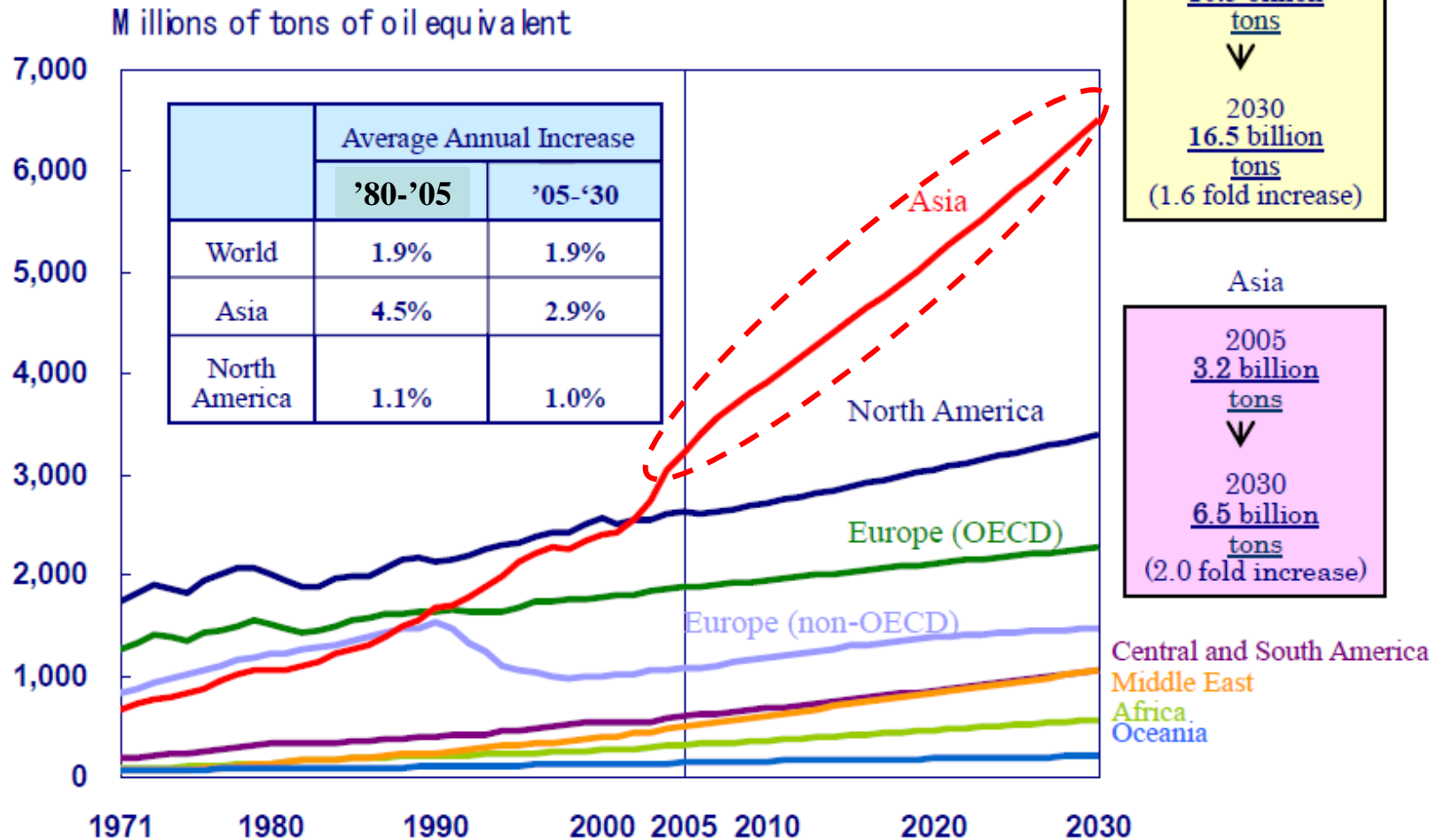
Desertification in China and west Asia



Storm hitting ASIA

Appetite for more energy in Asia

Global primary energy demand (by region)




Source:

“Asia /World Energy Outlook 2007”, The Institute of Energy Economics, Japan, October 2007

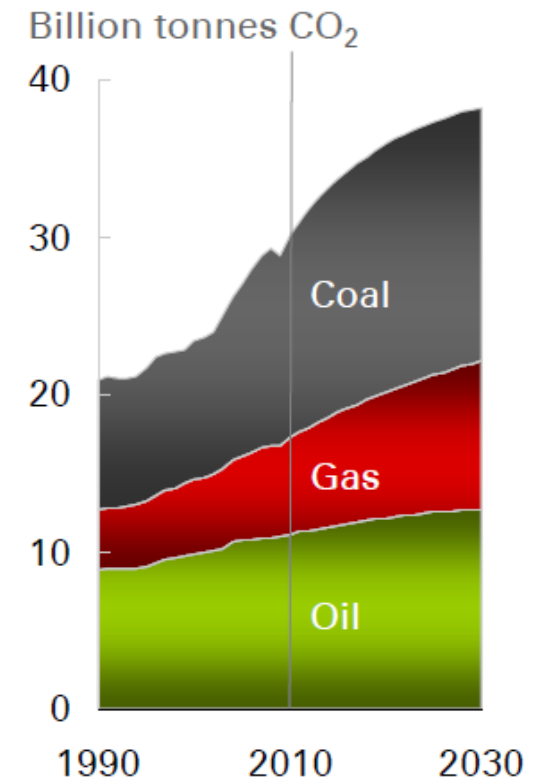
Fossil fuel



Share of fuel 1990-2030		1990	2030
(% shares of world energy use)			
	Renewables*	0.4	6.3
	Nuclear	5.6	6.0
	Hydroelectric	6.0	6.8
	Coal	27.3	27.7
	Natural gas	21.8	25.9
	Oil	38.9	27.2

88% in 1990
81% in 2030

Global CO₂ emissions from energy use
by fuel



* Renewable energy includes biofuels

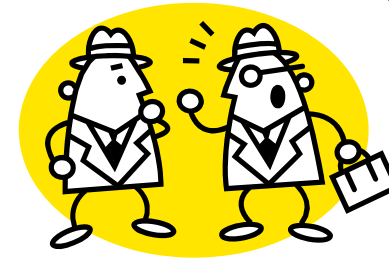
“BP Statistical Review of World Energy June 2011”

<http://www.bp.com/printsectiongenericarticle800.do?categoryId=9037134&contentId=7068677>

What are we doing to reduce GHG emission?

How we cope with this dilemma of appetite for more energy and GHG emission?

Kyoto Protocol, COP17, talk talk talk.....

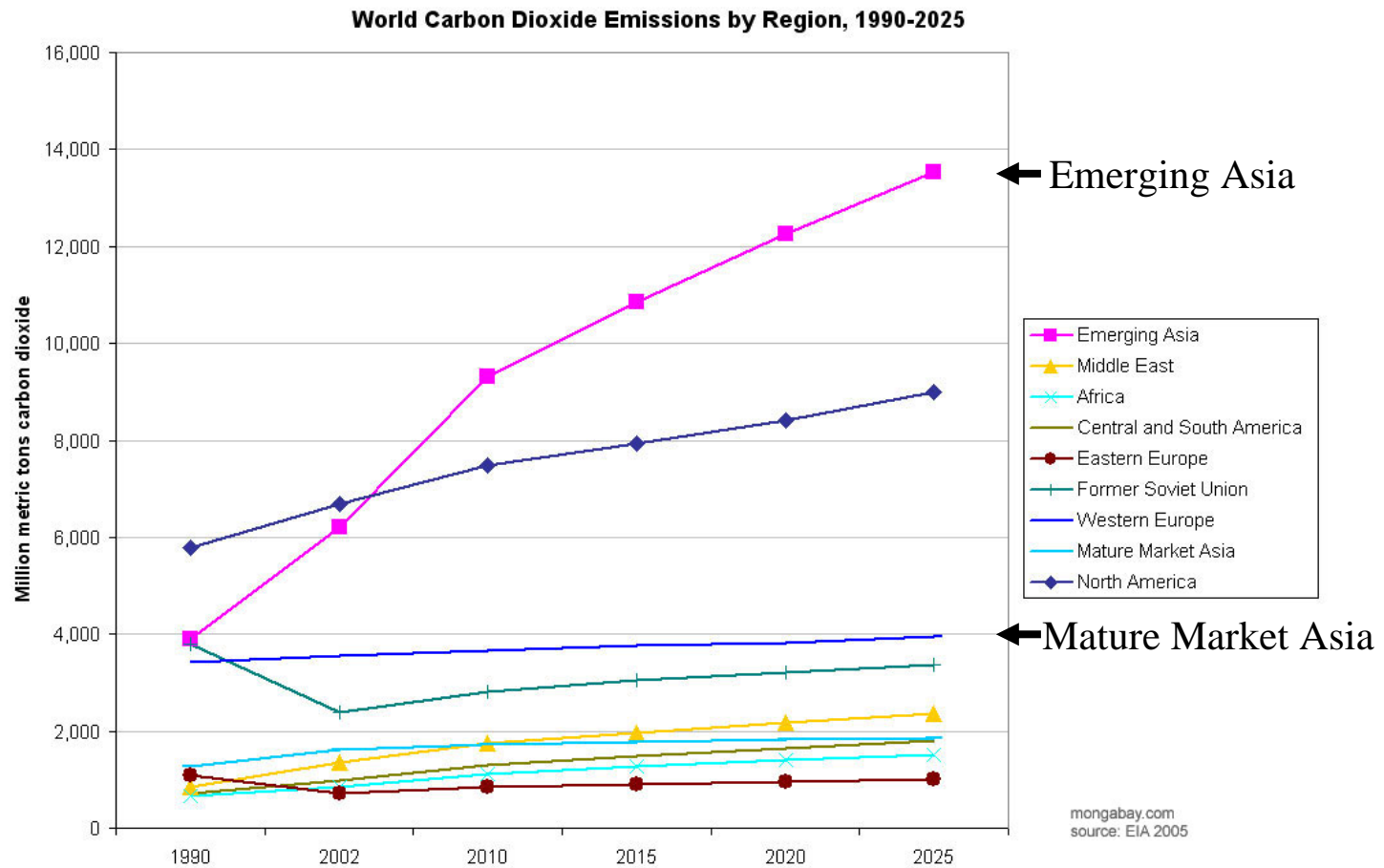


Regulatory and economic measures

- Regulation
- Pricing of carbon (Carbon Tax)
- Emission Trading Scheme



Carbon emission is rising



Despite steps in the right direction, the door to 2 degree is closing.
Without further action, **by 2017** all CO2 emissions permitted in the 450 Scenario will be “locked-in” by existing power plants, factories, buildings, etc.

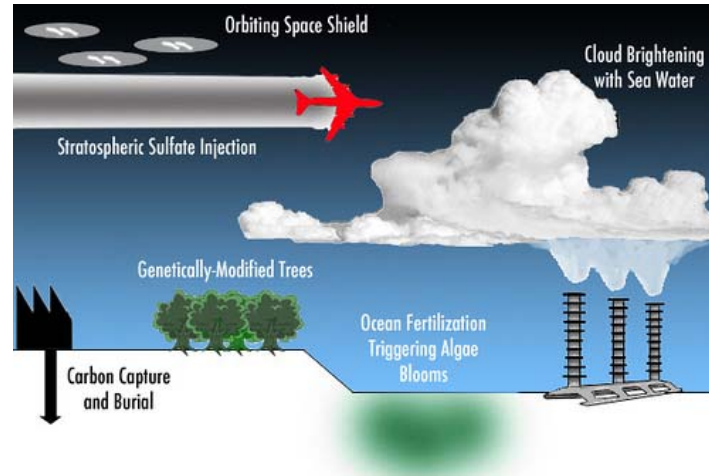
World Energy Outlook, 2011

Presentation to the press, London, 9 November 2011

What should we do now?

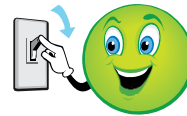
-How can we to reduce GHG emission?-

Silver bullet? NO!

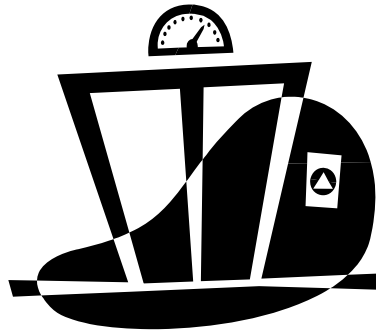


Policy Mix

- Energy-saving program
- Education
- Renewable energy
- Share experience, knowledge, success stories
- Nuclear power???



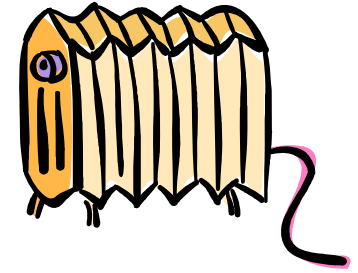
What can we do more?



Use fire escape 50 m down the corridor to save power?



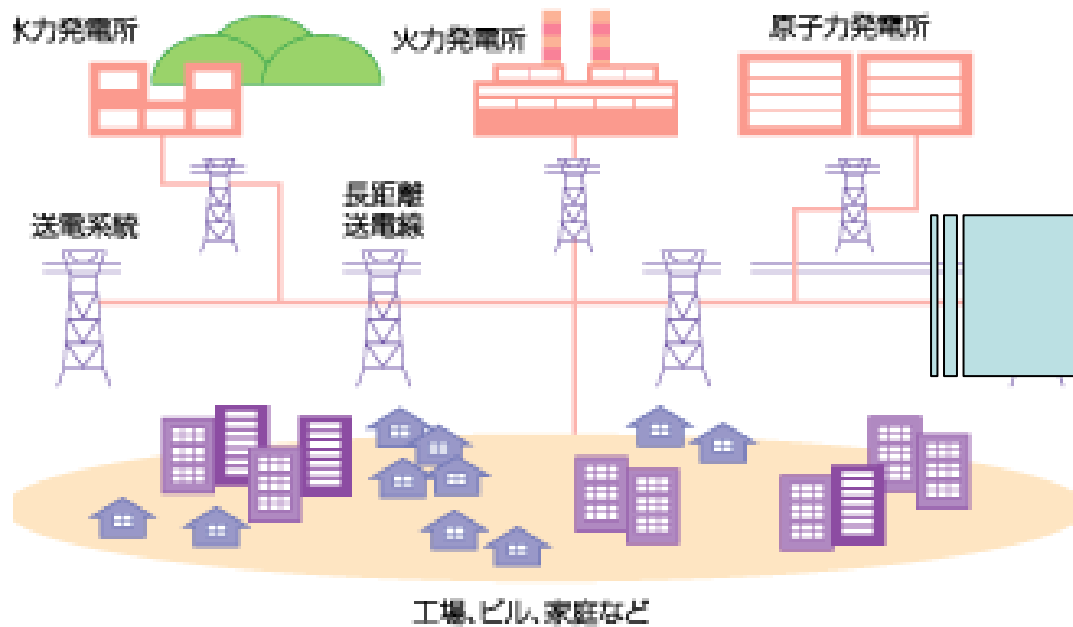
Window fixed



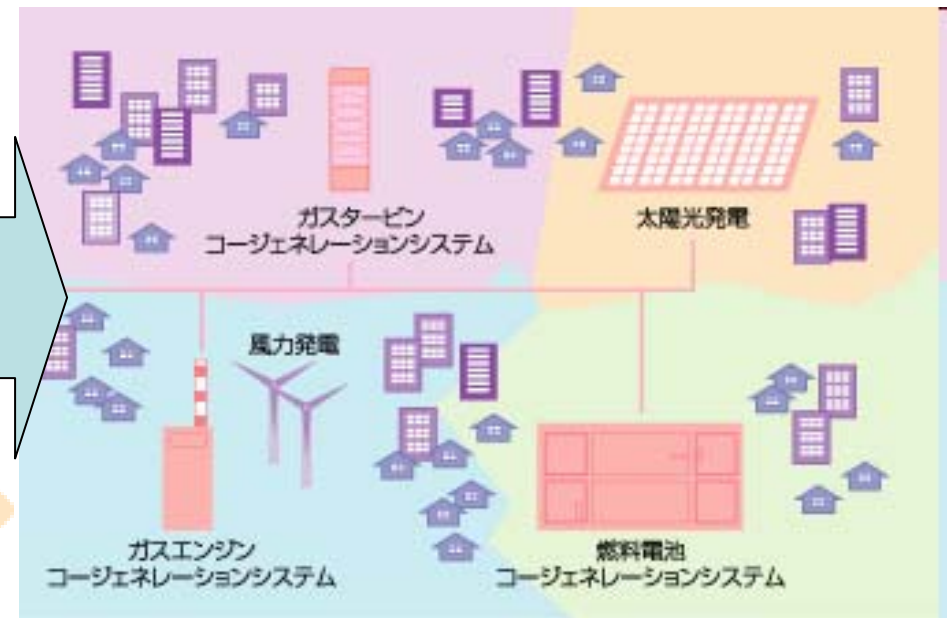
Bus stop is miles away.

Energy system

Now; Large-scale power grid



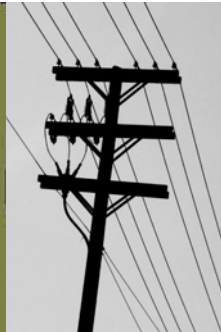
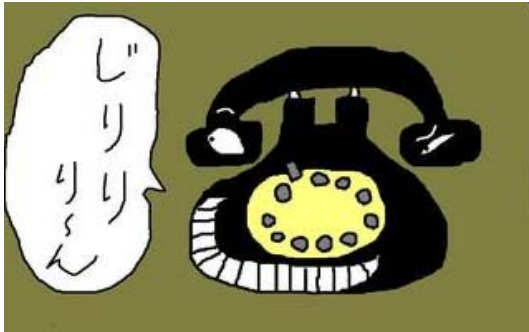
Future; Smart energy network



- Power grid with large power plants in remote areas
- Power flows one way
- Concern for massive power outage

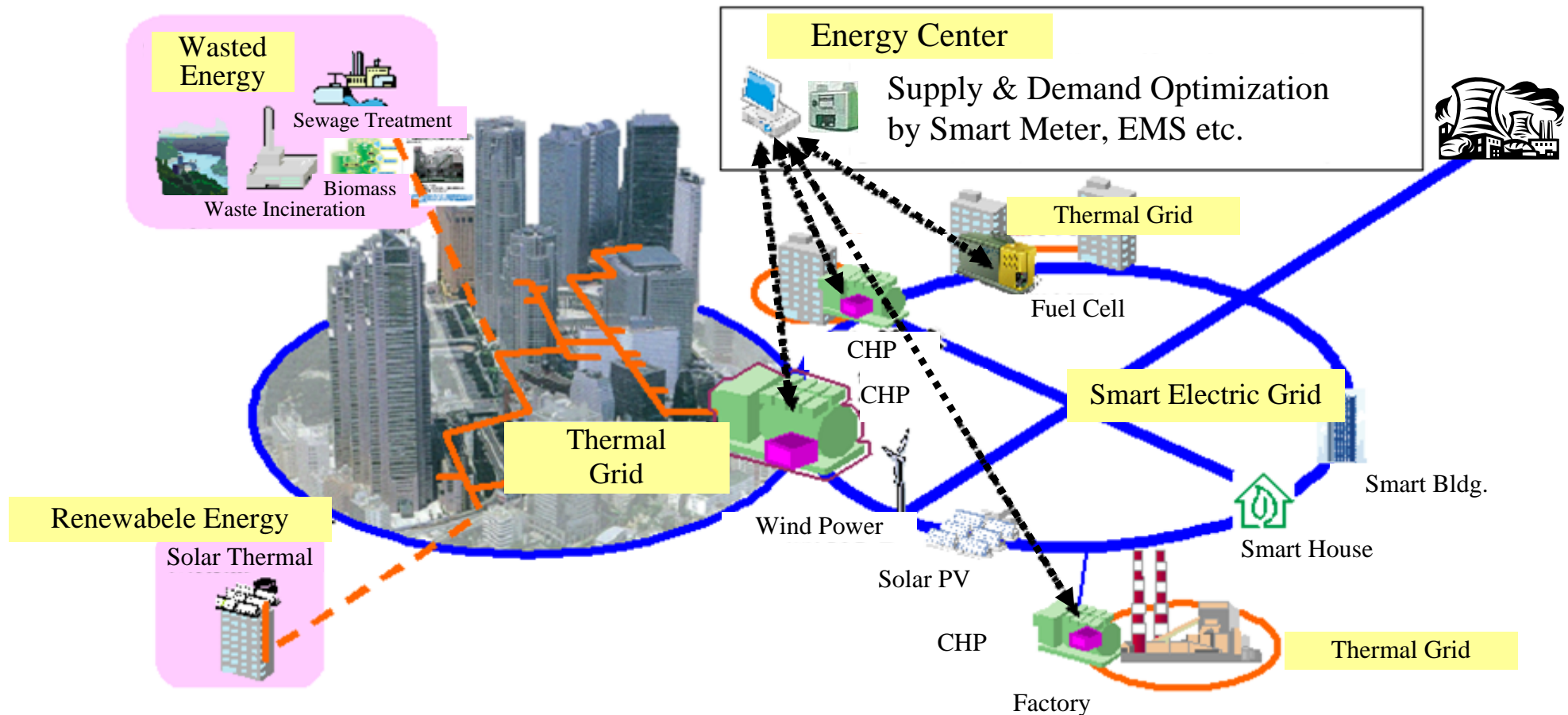
- Small energy plants, renewable energy system and other variety of system embedded in a energy grid.
- Energy flows both ways
- Resilient to breakdowns

Transformation



Conceptual Scheme of the Smart Energy Network

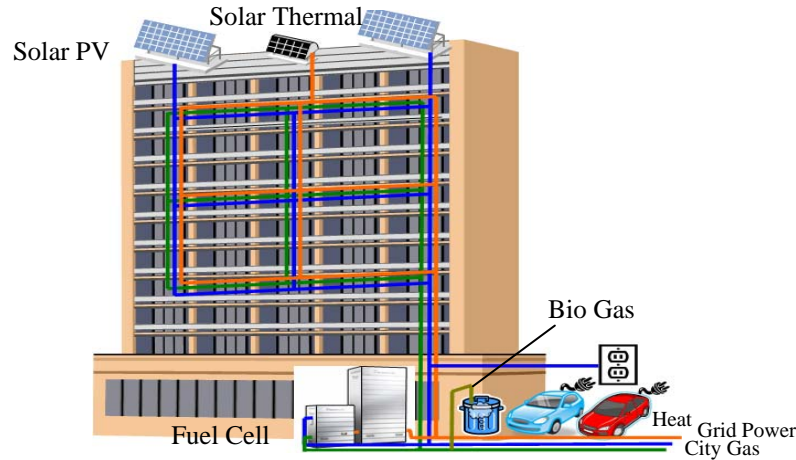
- (1) Integrated Optimization Incorporating Electric Grid and Thermal Grid
- (2) Networking Distributed Energy Resources Such as Fuel Cells, CHPs
Enhances Utilization of Renewable Energy and Wasted Energy
- (3) ICT for Both of Supply and Demand Side Control Benefits Superior
Energy Saving and CO2 Reduction



Classification of the Smart Energy Network

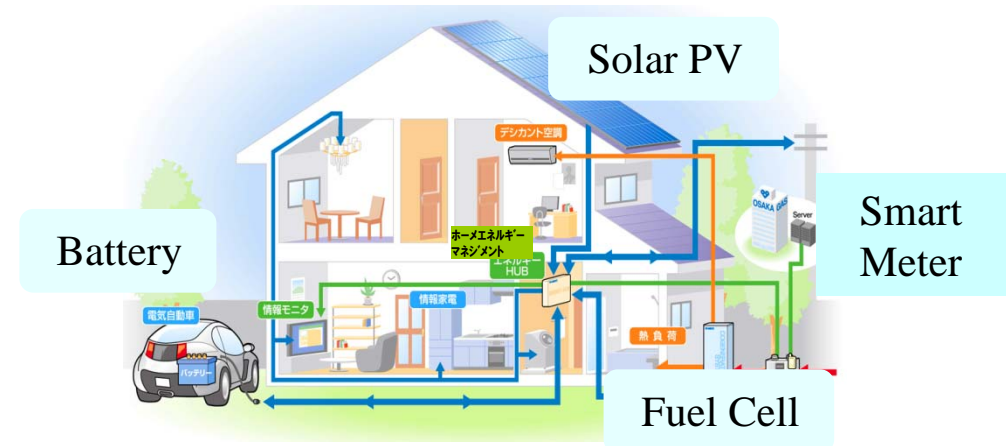
1. Energy Network in apartment houses

Common use energy equipment incorporates renewables and interchanges heat and electricity in a condominium.



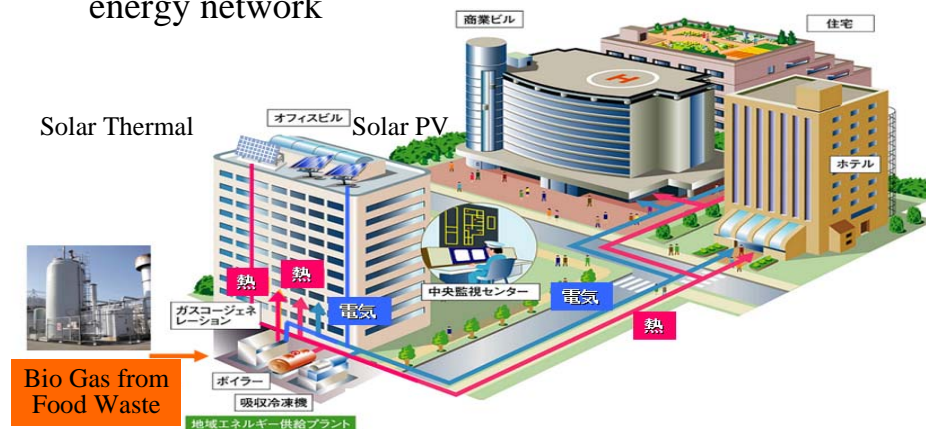
2. Energy Network in single family house

Utilize renewables with fuel cell and battery to optimize use of heat and electricity in a house.



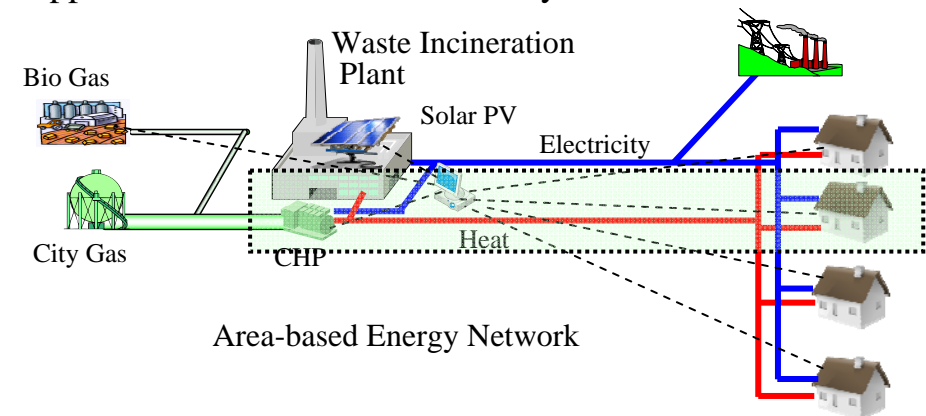
3. Area-based Energy Network in Commercial District

Common use energy equipment for optimum district energy network



4. Area-based Energy Network Using Urban Wasted Heat

Heat from waste incineration is combined with CHP to be supplied to customers in the vicinity.



Conclusion;

- Old and non-flexible energy system need to be changed
- Set long term goal to build “Smart Energy Network” in Asia.
- For those region without energy system, consider it fortunate. Leap flog to a low carbon energy system. Don't follow the footstep of bad example.
- Technologies are there. So let's use it!





Thank you

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