

Green Innovation of renewable energy supply and use is crystallized in good manner of cluster of city-region

C40 : Climate Leadership Group, the world's largest cities committed to tackling climate change, London, Paris, Berlin, New York, Tokyo, Seoul, Beijing, Bangkok, Cairo, Bogota, Moscow, and others including Yokohama and other 15 affiliate cities

ICLEI: an international association of local governments, that have made a commitment to sustainable development, starting in 1990, having members in more than 1100 Cities, including Kyoto, Kitakyushu, and other 16 cities in Japan

4 pilot cities, Kitakyushu, Yokohama, Toyoda, Kyoto-South for Smart city & energy innovation, 2010

Typical city networks for low-carbon society

Environment model city in Japan, 13 Cities in 2009 that take up the challenges of conducting pioneering initiatives with lofty goals, in order to transform Japan into the world's precedent setting "low-carbon society," (www.kantei.go.jp)

17 Large Cities Network of ordinance-designated city to share visions and practices of low-carbon economy or sustainability in city-regions

Eco-city network, eco-polis or **eco-town** network started in specified urban environmental concerns in Japan prior to global sustainability initiative

- Yokohama
- Kyoto
- Kitakyushu
- Kyoto, Kitakyushu, Sapporo, Kawasaki, Kobe, Sendai, Nagoya, Hiroshima
- Kyoto, Yokohama, Kitakyushu, Sakai
- Kitakyushu, Sakai, Toyama, Minamata

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● One of the largest class of Sakai Solar Power System started full operation on 7th of Sep., having 10MW, yields 11million kWh/year equivalent to consumption in 3000 family, CO2 reduction of 4000 t-CO2, on the sanitary landfill site, 21ha, which sponsored by Sakai City and Kansai Electric Power Company(KEPCO), has been promoted under the Sakai Environmental Model City Program



● Kawasaki city and Tokyo Electric Power Company(TEPCO) started operation of 7 MW Solar Power in Ukishima, besides 14 MW Solar in Ohgishima, on 10th of Aug. Kawasaki city has initiatives to “Carbon Challenge Kawasaki Eco Strategy”

● Yananashi Pref. and TEPCO may open electricity service of 10MW solar plant on Jan. of 2012, yield 12million kwh and 5100t-CO2 (for 3400 families) on prefecture-owned land of 14ha.

● Electric companies test the performance or reliability of grid system under the heavy fluctuation of voltage in electricity of Solar Power.

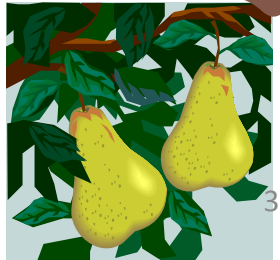
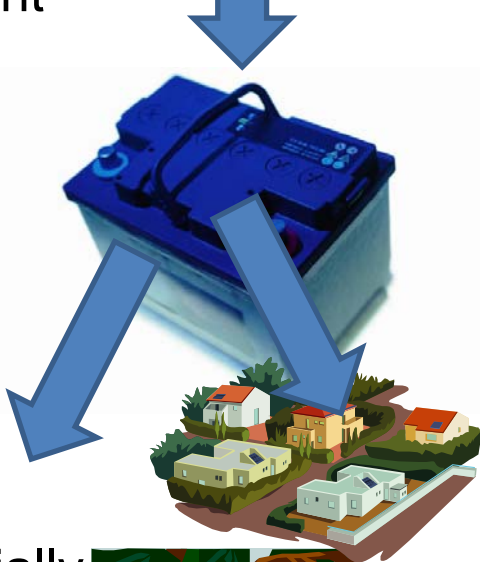
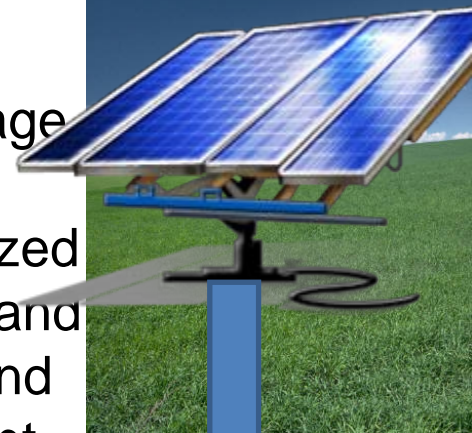
● Green Innovation model linking renewable energy supply to demand should be crystallized in good manner of cluster of city-region which have variety of suitable location for mega solar facilities, coupling the highest environmental values of users close to solar power plants with considerable volume of storage batteries.

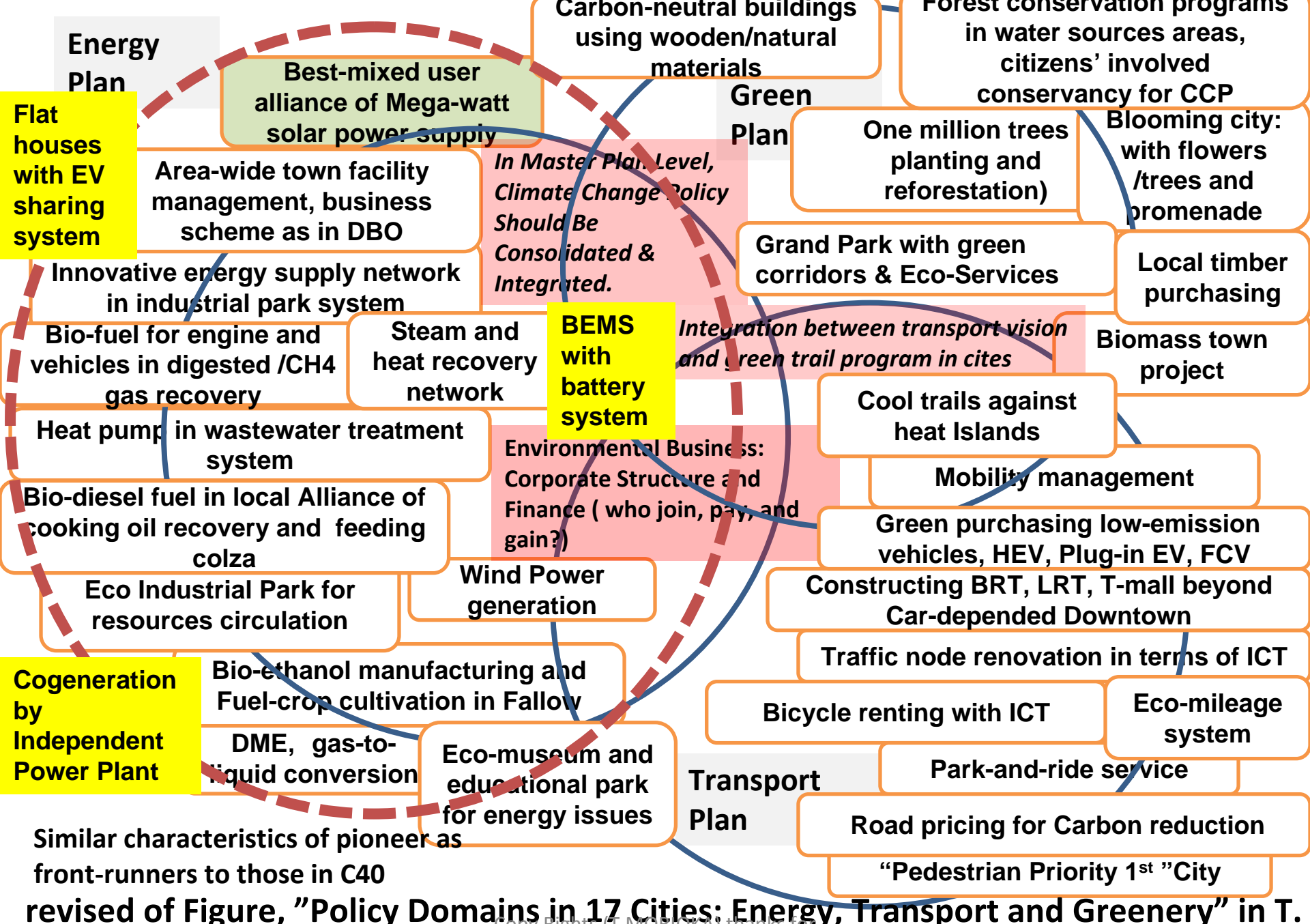
● First, municipal waste disposal areas are judged as prioritized mega solar power generation sites, because of inferiority of land use for agricultural field, less bearing capacity, and simple land ownership; an unit of 10ha surface may support a 10MW plant

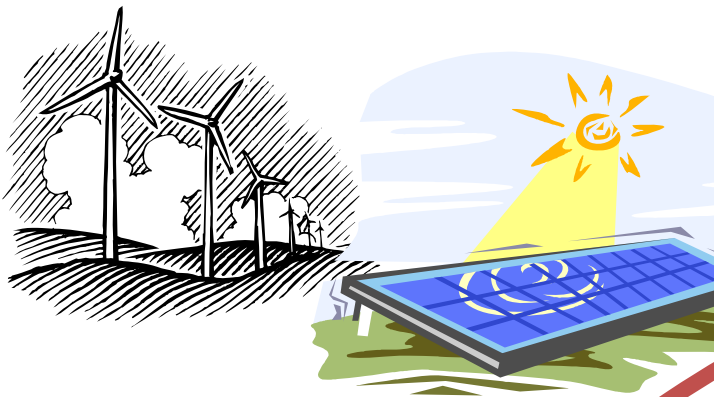
● The most influential intended end-usage would be urban greenery services, vegetable factories on landfill site, in collaboration with local smart home and town with eco-electricity

● Second, collectively managed green-roofs of warehouse, shipping storage building, railway platform and terminal big and so on would be appraised as advantageous structures for laying solar cells on them, operated efficiently, closing to electricity users sectors.

● Users are expected to save electricity consumption especially in high demand peak time, and absorb the ups of electricity consumption turbulence by means of installing building-based conditioning batteries, or pay off time-priced bill





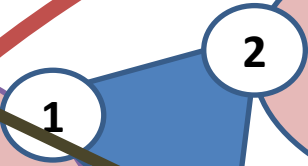


Combined Heat & Power for basic distributed energy supply, even for emergency use

Heat Storage System by using ice thermal storage tank



Local Renewable Energy Supply System with considerably conditioned by capacitors, batteries or power control unit(PCS)



BEMS, Building Management System for Smart Energy Management

Battery Charging System detached in car parking in Building

Urban Energy Management in town-scale or region-scale

Battery charging infrastructures supported by retailers, park business

Region-wide or national grid

Private auto mobile, bus system and waste collection vehicles or other business driving vehicles with electricity (Plug-in He, EV)

