

For the Better and Cleaner Earth Global Smart Grid Initiative : the Case of Korea



Yujin Song

Korea Institute of Energy Research



KSGI

(재) 한국스마트그리드사업단
Korea Smart Grid Foundation

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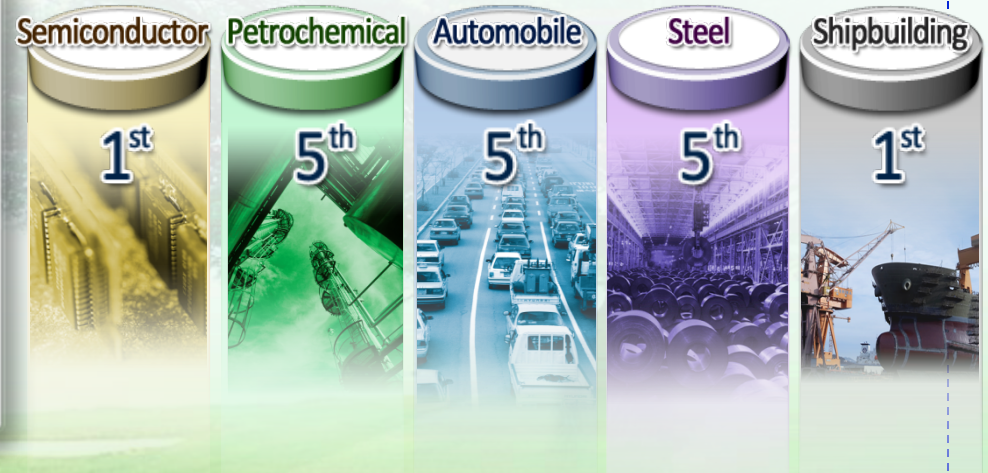


Korea and Power Industry : Overview

South Korea Overview

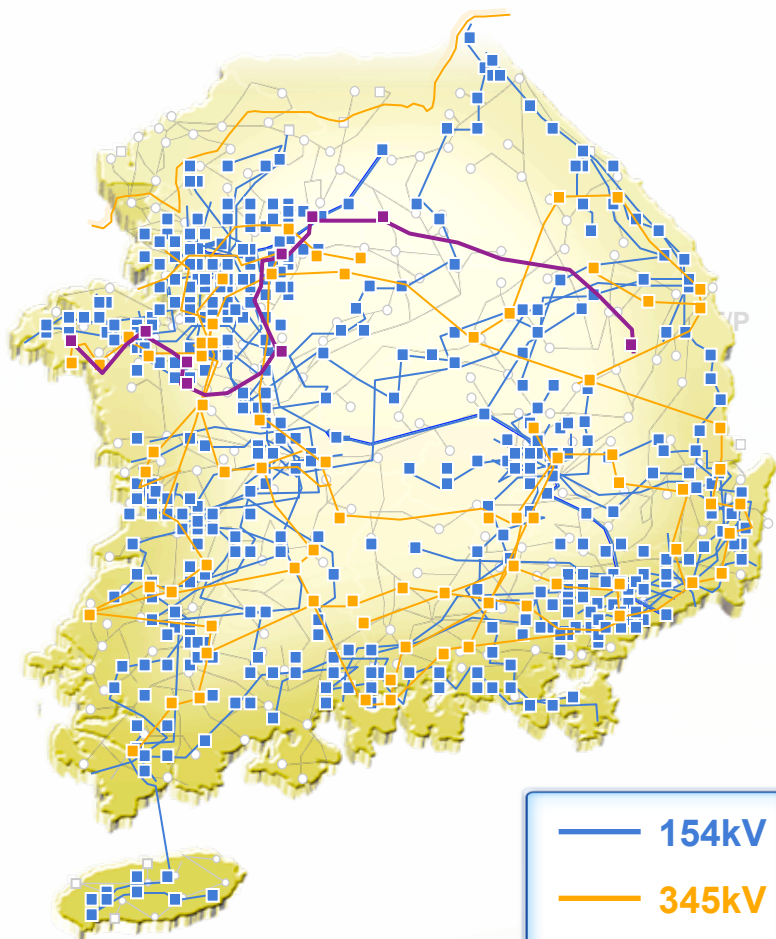


- Area: 99,720km² (115th in the world)
- Population: 48 million (26th in the world)
- GDP : U\$929.1 billion (14th in the world[2007])
- Trade : U\$950 billion (10th in the world)
- Key Industries and Global Ranking



Korea Electricity Industry

Power System in 2008



— 154kV
— 345kV
— 765kV

● Installed Capacity 72,491MW (12th in the world)

- Output : 422,355MWh
- Peak Demand : 62,794MW (2008)
- Trading Volume : 24.3 billion dollars

● Transmission lines: 29,929 c-km

● Industry structure

- Generation market share : KEPCO affiliates (88%), IPPs(12%)
- T&D, Retail Owner : KEPCO
- ISO/RTO : Korea Power Exchange

● Power Quality

- Black-out Hours : 17 minutes/home/year
- T&D Loss : 4%



Why Smart Grid?



(National dimension)–Climate change and Energy Solution

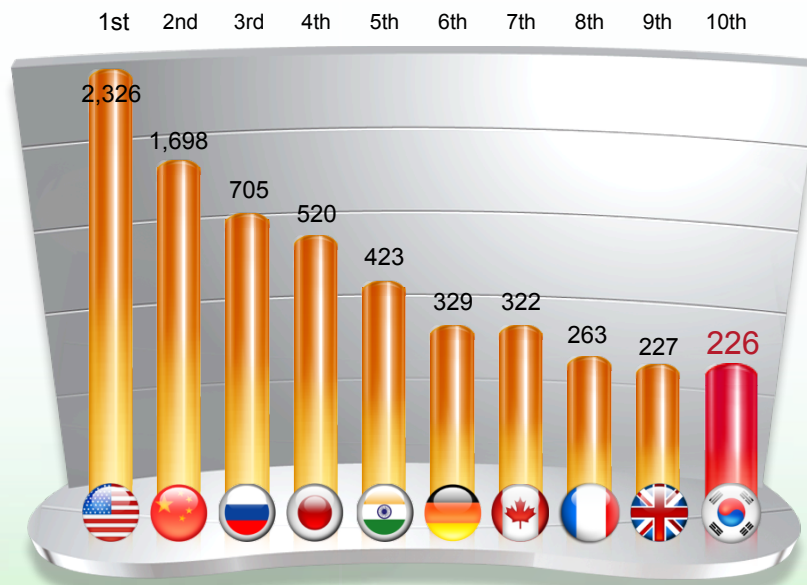
As-Is

- One of 10 largest energy consumption countries
- Foreign Energy Dependency (97%), (2008: U\$141.5 billion)

Objectives

- Secure energy security and improve trade balance through reducing dependency on fossil fuel
- Implement measures on UNFCCC (UN Framework Convention on Climate Change) through increasing the efficiency in using electric energy

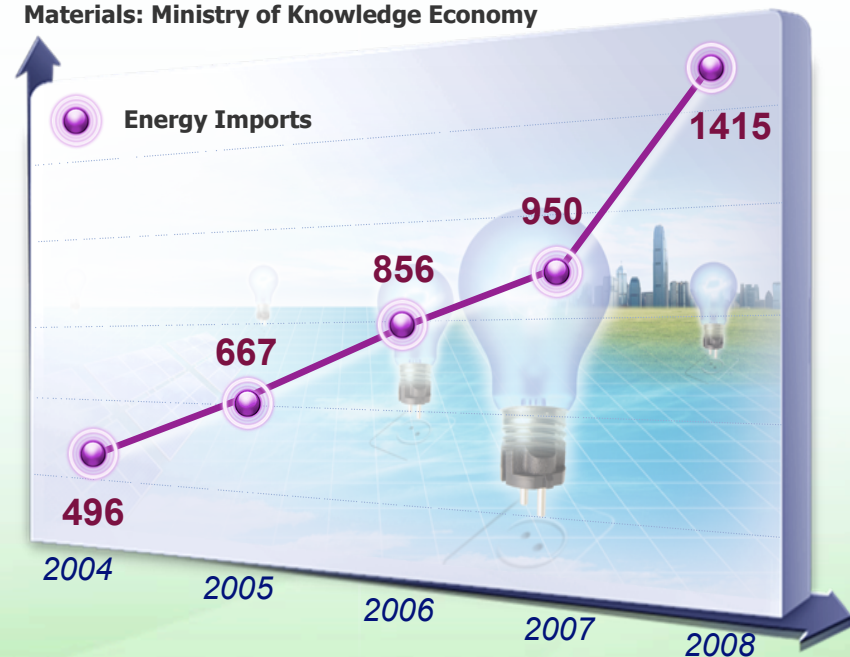
Global Energy Usage



Source) 1. Consumption of Energy and Oil 2006:
BP Statistical Review of Energy(BP,'07.6)

Energy Imports

Unit: one hundred million dollars
Materials: Ministry of Knowledge Economy



(Industrial dimension)–New Growth Engine Solution

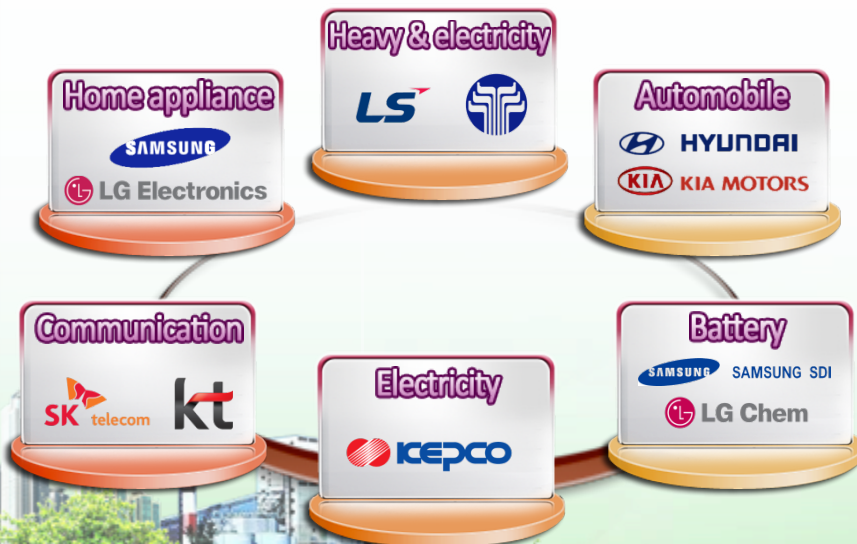
As-Is

- A strong country in the field of information & communication
(World-first CDMA commercialization, distribution ratio of broad band Internet: ~80.6%)
- Even development of Smart Grid related industries
 - Samsung Electronics, LG Electronics, Hyundai Motors, SKT, KEPCO, etc.

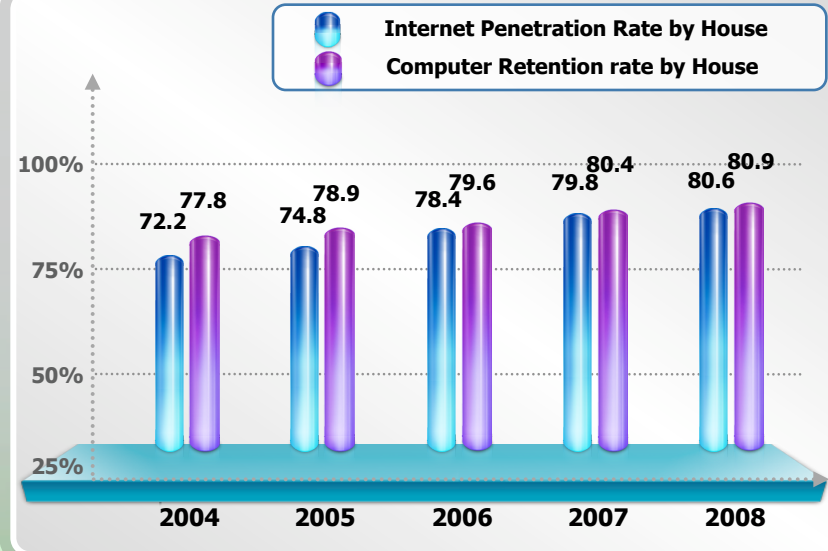
Objectives

- Develop next-generation growth drivers matching with the paradigm in the age of green growth
- Generate new green jobs

Fusion of Industries



Graph of IT industry growth rate (Super speed Internet distribution rate...)



(Individual dimension) – low carbon/green living

As-Is

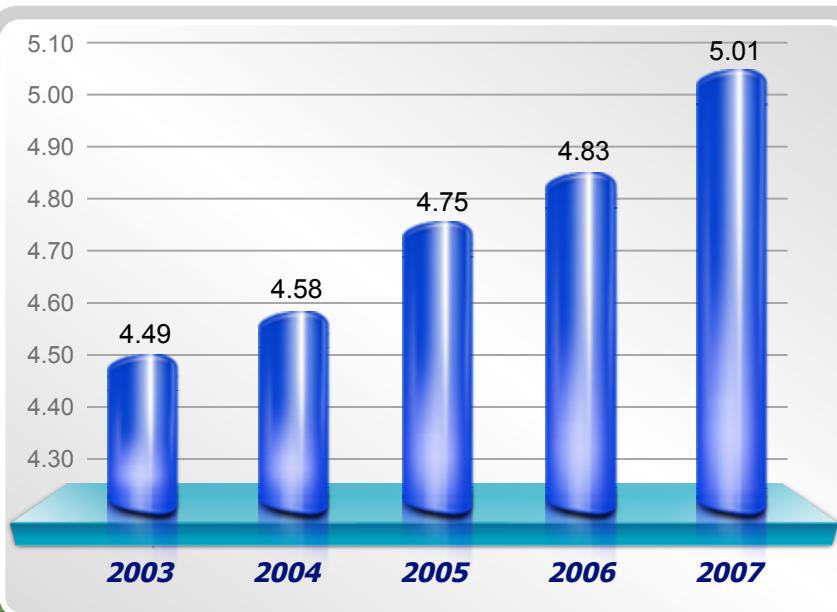
- Continuous growth of per capita energy consumption (Year 2.7%)
- Ever increasing numbers of registered cars (Year 2.8%)

Objectives

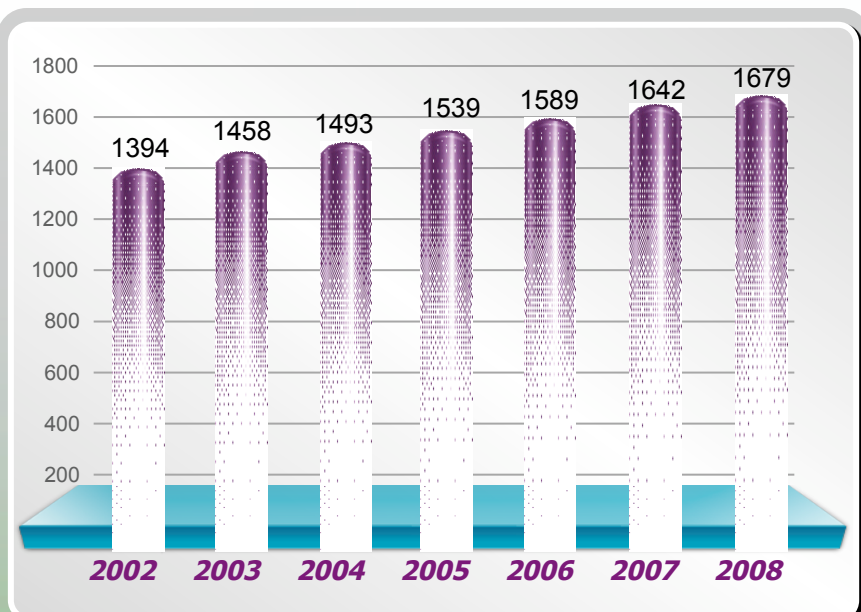
- Optimize energy usage by dynamic pricing
- Build national charging infrastructure



Energy Consumption per Capita (TOE)



Number of Cars per Year (10thousands)





Vision & Implementation

Vision and Goal

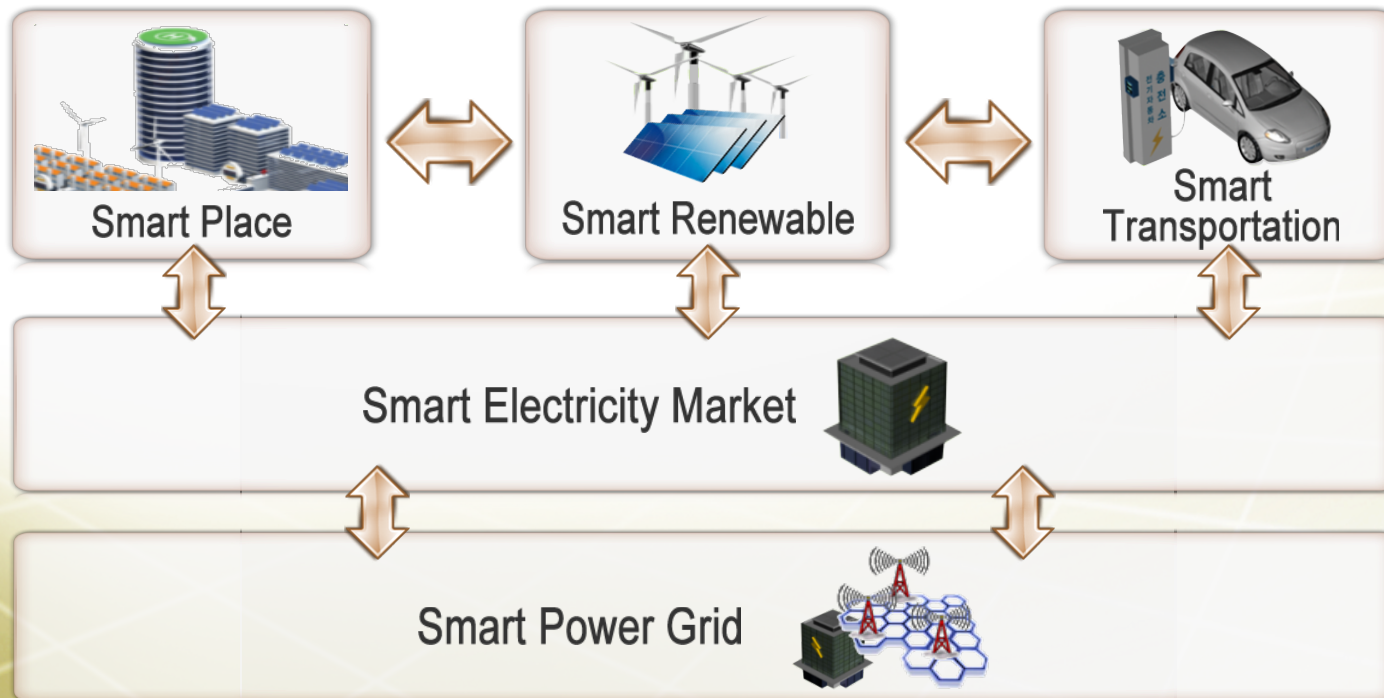
Vision

Low Carbon Green Growth Korea

Goal

Complete nation-wide Smart Grid by 2030

Smart Grid Platform



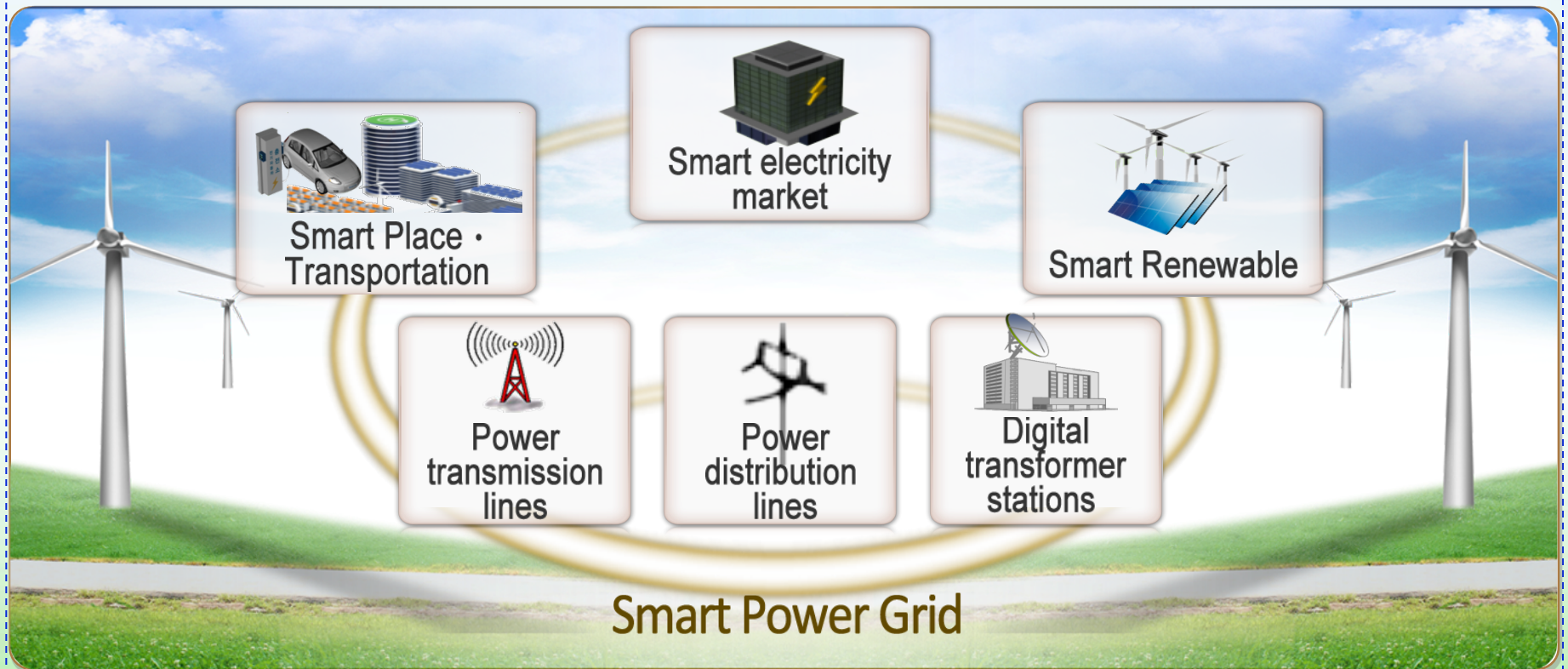
Smart Power Grid

Short-term Goal (2012)

- Key operation technologies
- Distribution automation
- Key communication network

Long-term Goal (2020)

- WAMS
- Self-healing
- DER accommodation
- Advanced Communication network



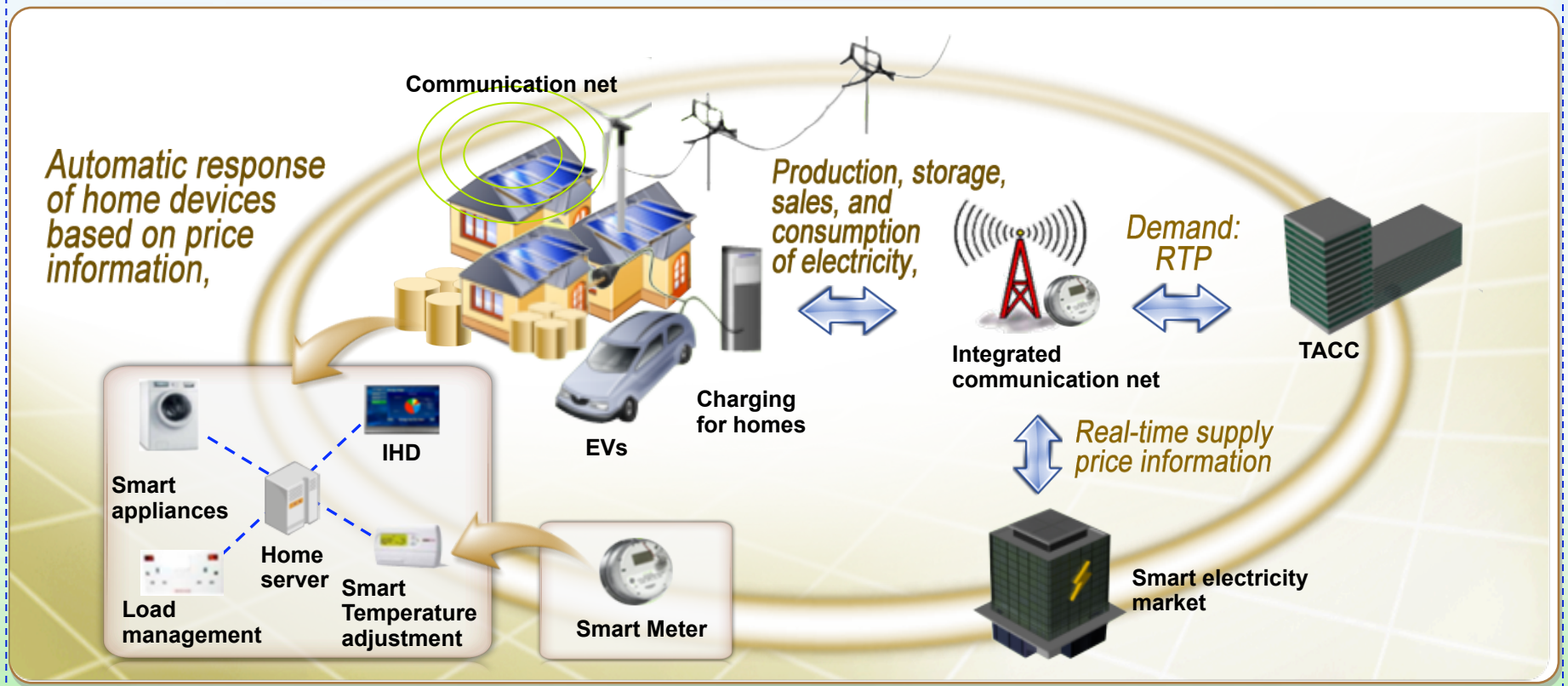
Smart Place

Short-term Goal (2012)

- Real-time information exchange based on AMI
- Dynamic Pricing (CPP, RTP)

Long-term Goal (2020)

- Full-fledged consumer participation
- Automated retail transaction based on advanced AMI



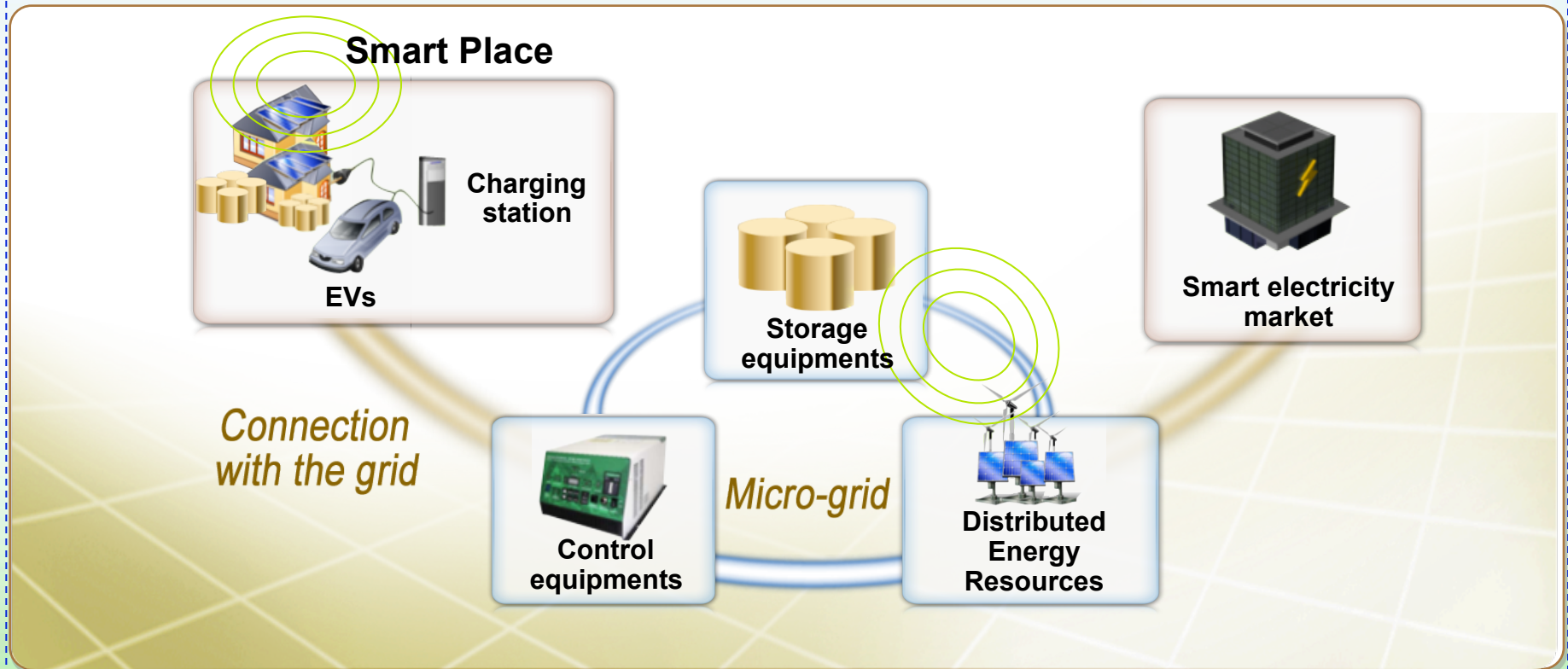
Smart Renewable

Short-term Goal (2012)

- Flawless integration of micro-grid
- Commercialization of storage products

Long-term Goal (2020)

- Full accommodation of DER and micro-grid
- Large-scale gridwise storage system



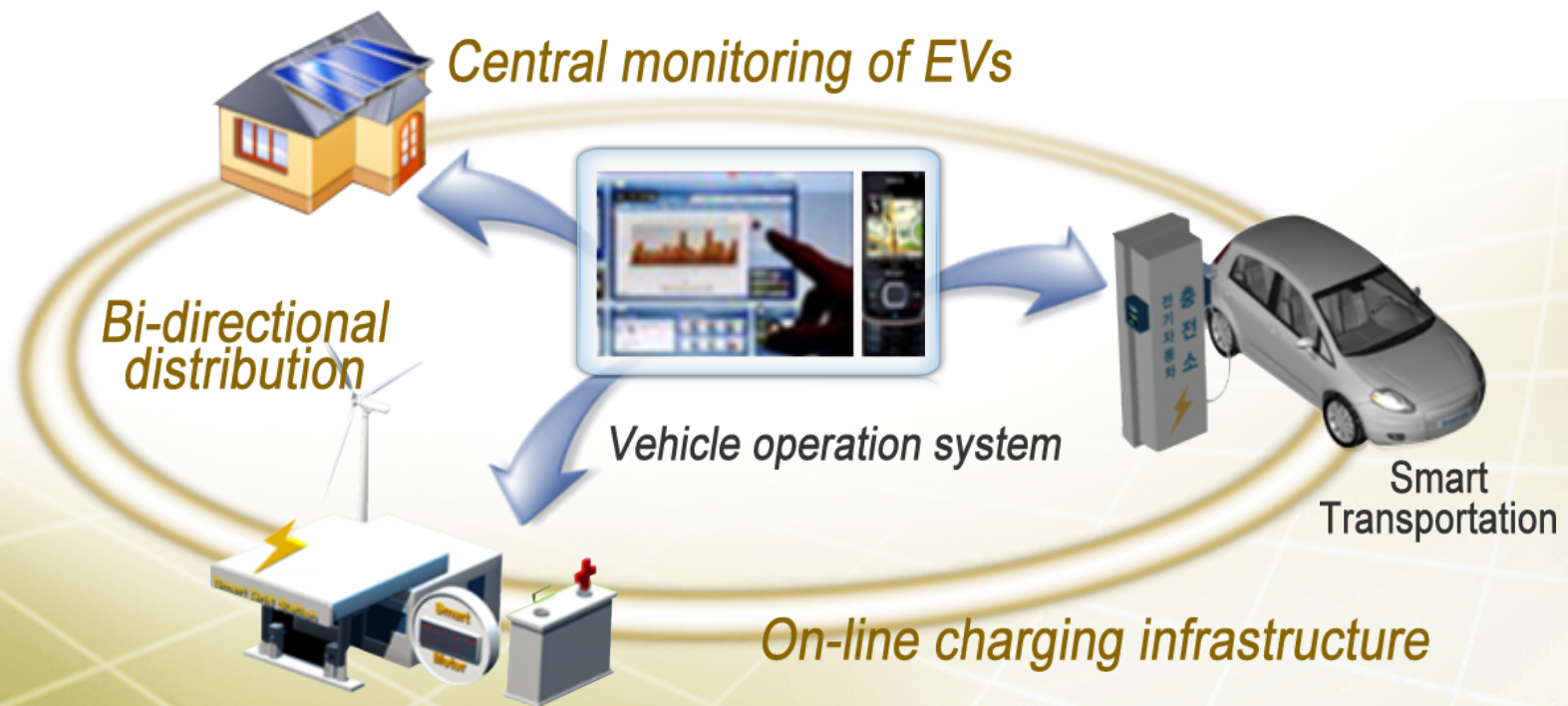
Smart Transportation

Short-term Goal (2012)

- EV charging infrastructure
- Best practice for EVs

Long-term Goal (2020)

- National charging infrastructure
- Consumer friendly charging system



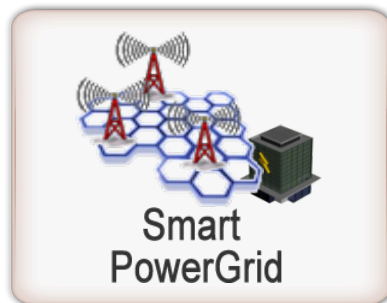
Smart Electricity Market

Short-term Goal (2012)

- RTP based on wholesale electricity market
- Consumer friendly dynamic pricing (CPP, RTP..)

Long-term Goal (2020)

- Mature retail market based on RTP
- Fusion of heterogeneous industries
- Fast-east Asia interconnection





Korea Demonstration Program

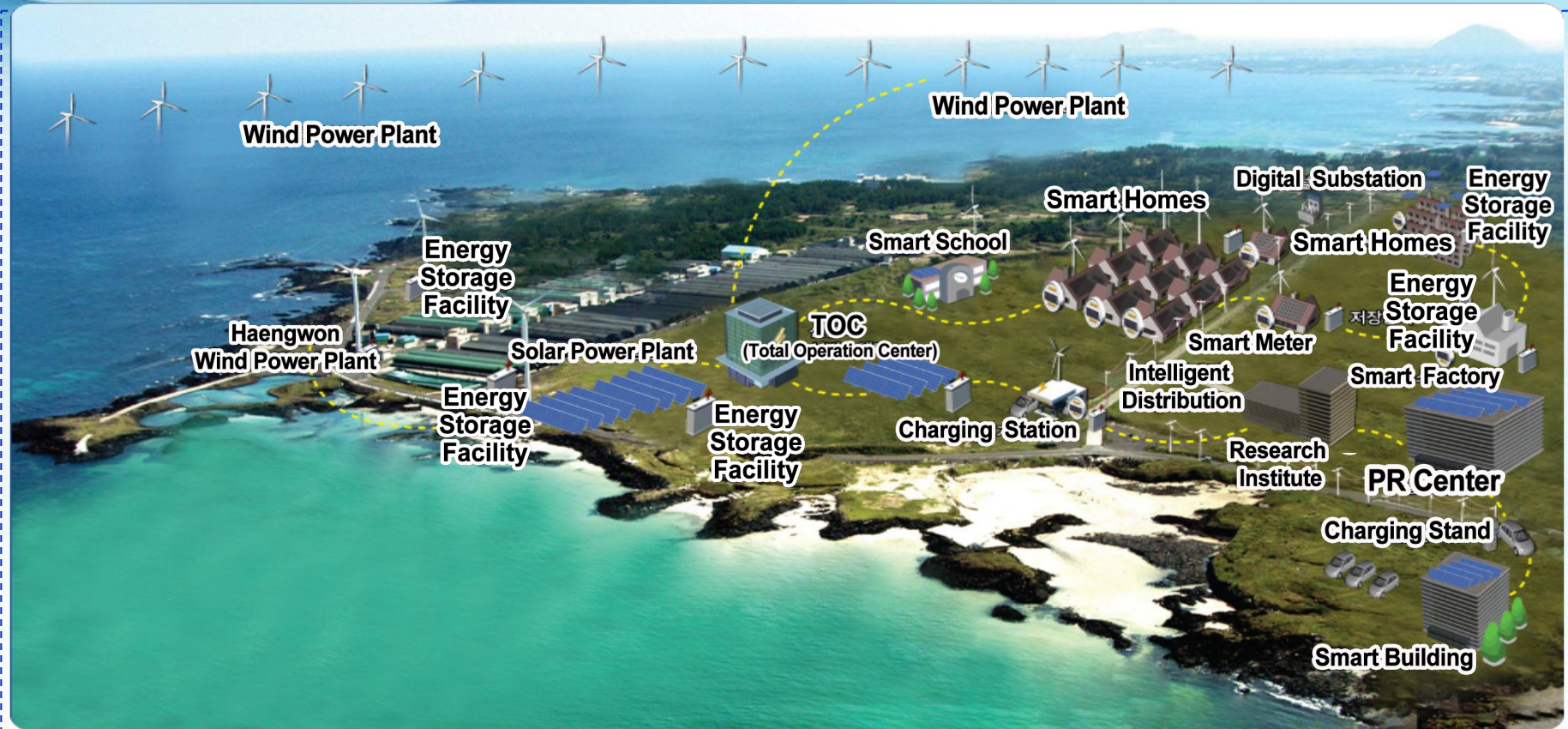
Jeju Smart Grid Test Bed



- Schedule: December 2009 to May 2013 (first 18 months to build infrastructure; next 24 months to test integrated operation of smart grid)
- Location: Gujwa-eup, Jeju Island (185 km²; 6,000 households)
- Budget: \$200 million (\$50 million public funds; \$150 million private investment)



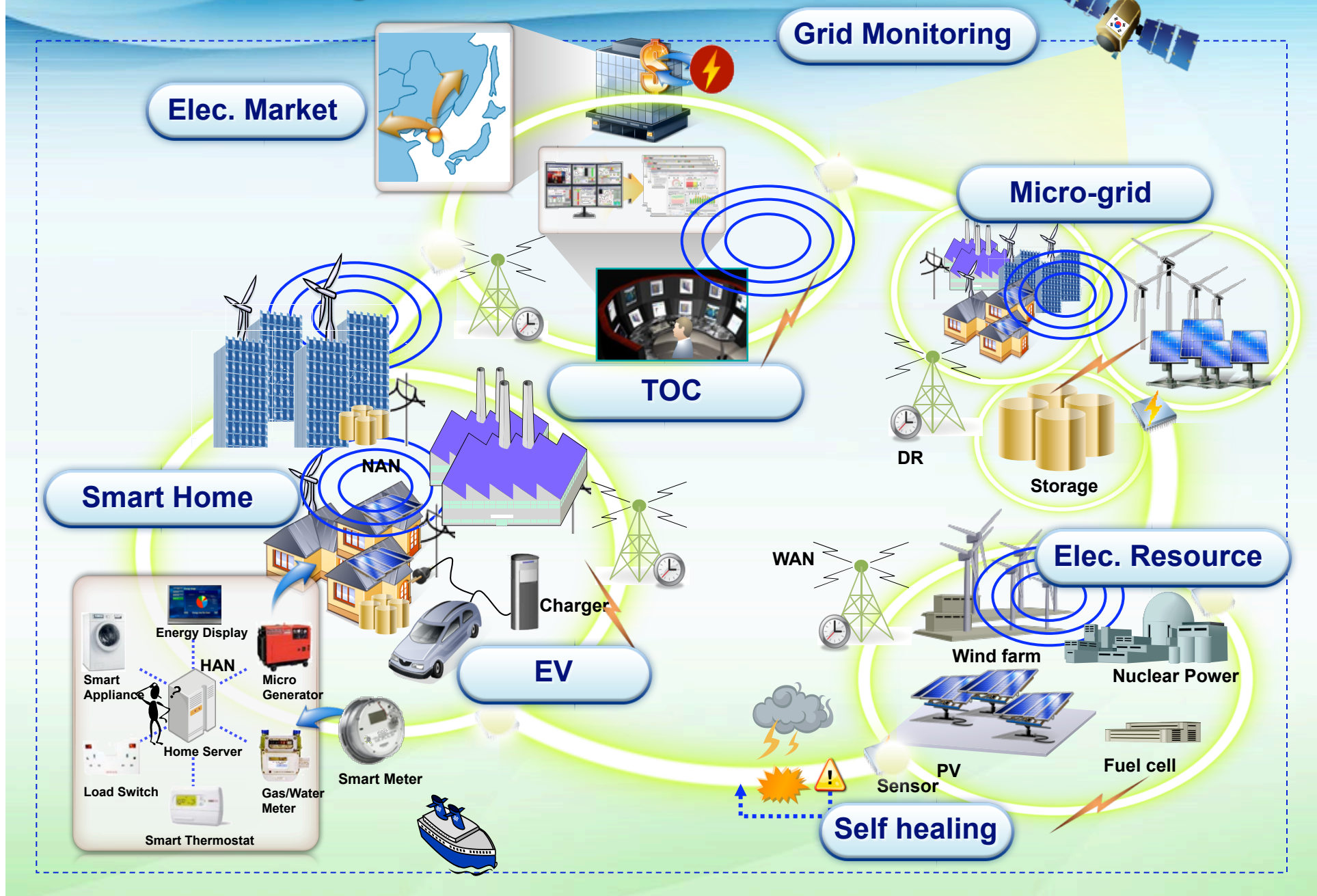
Jeju Smart Grid Test Bed



Features:

- Integrated test bed
- Close collaboration between public and private sectors
- Verification of different power market models
- Participants: Korea Electric Power Corporation (KEPCO) plus automakers, telecommunications companies and home appliance manufacturers
 - Includes major companies such as LG, SKT, KT and Samsung
- Open to foreign companies

Future of Jeju Smart Grid Test Bed





Thank you