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# Smart Grid in Korea

**Yeoungjin Chae**  
**Korea Power Exchange**

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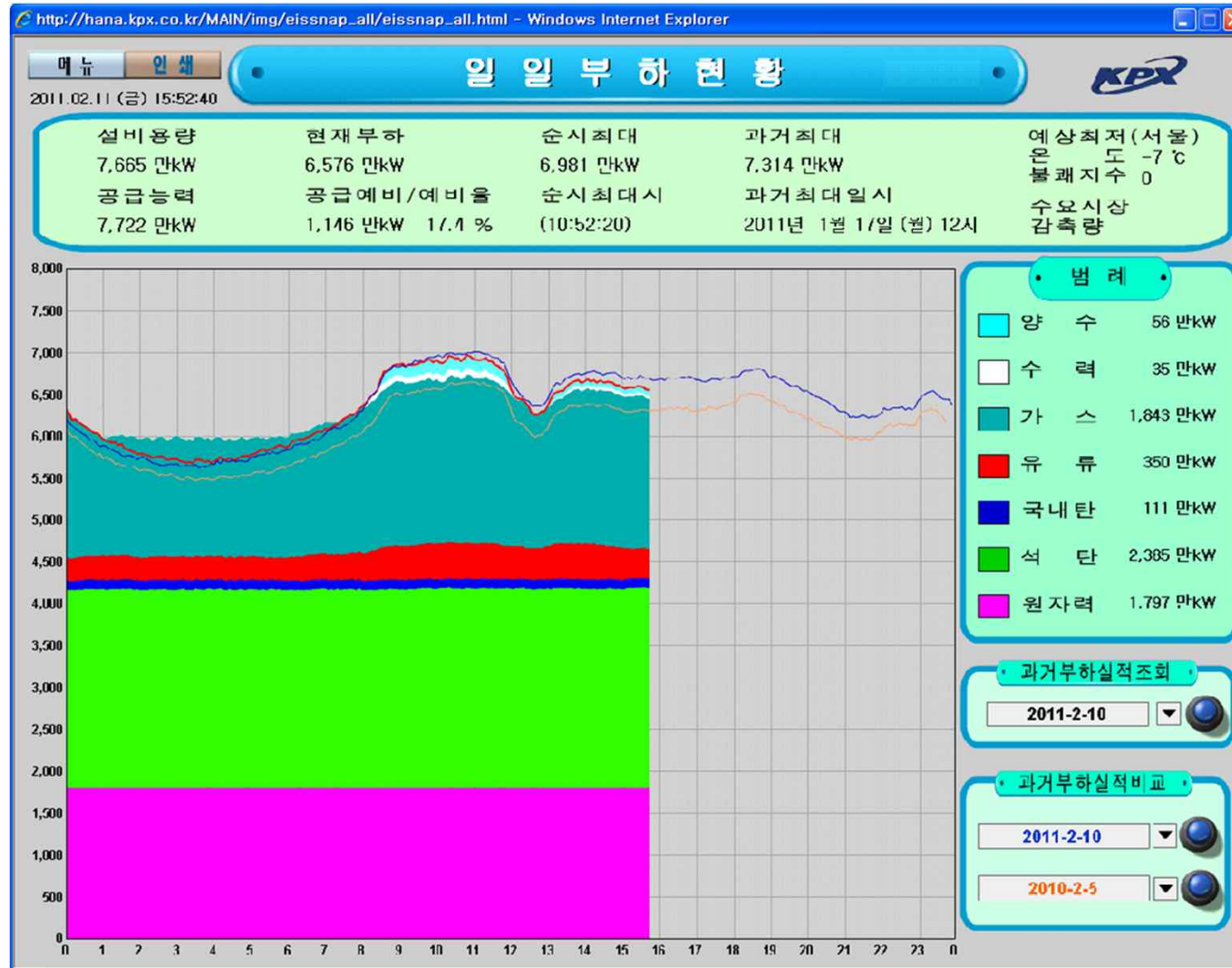
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# Who We Are

# KPX introduction

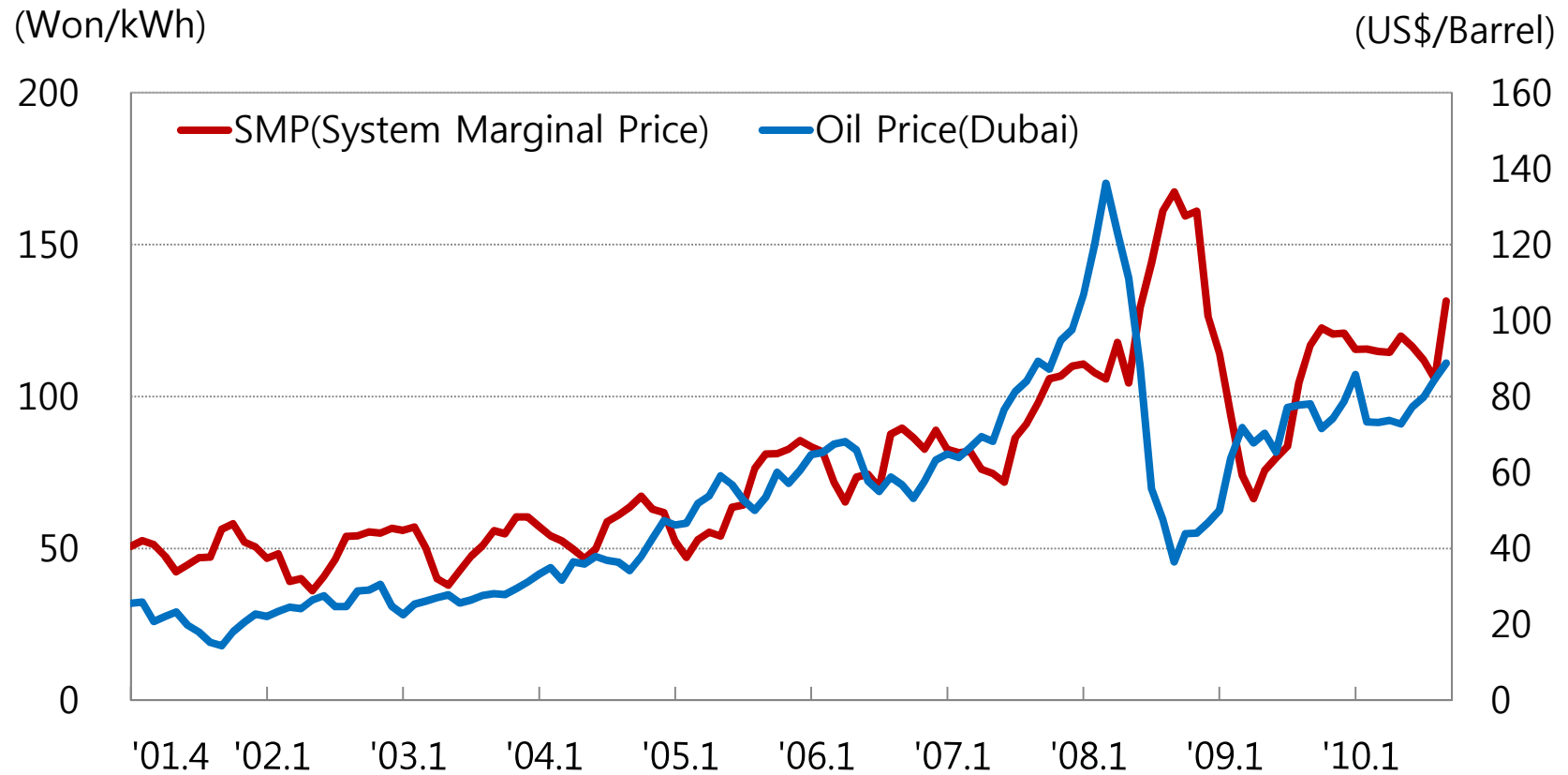
- **Establishment : APR, 2001**
  - With the commencement of Electricity Industry Restructuring(2000)
- **Non-profit & Independent**
- **Mission**
  - Power System Operation
  - Electricity Market Operation
  - Long-term Power Planning

# System operation



# Market operation

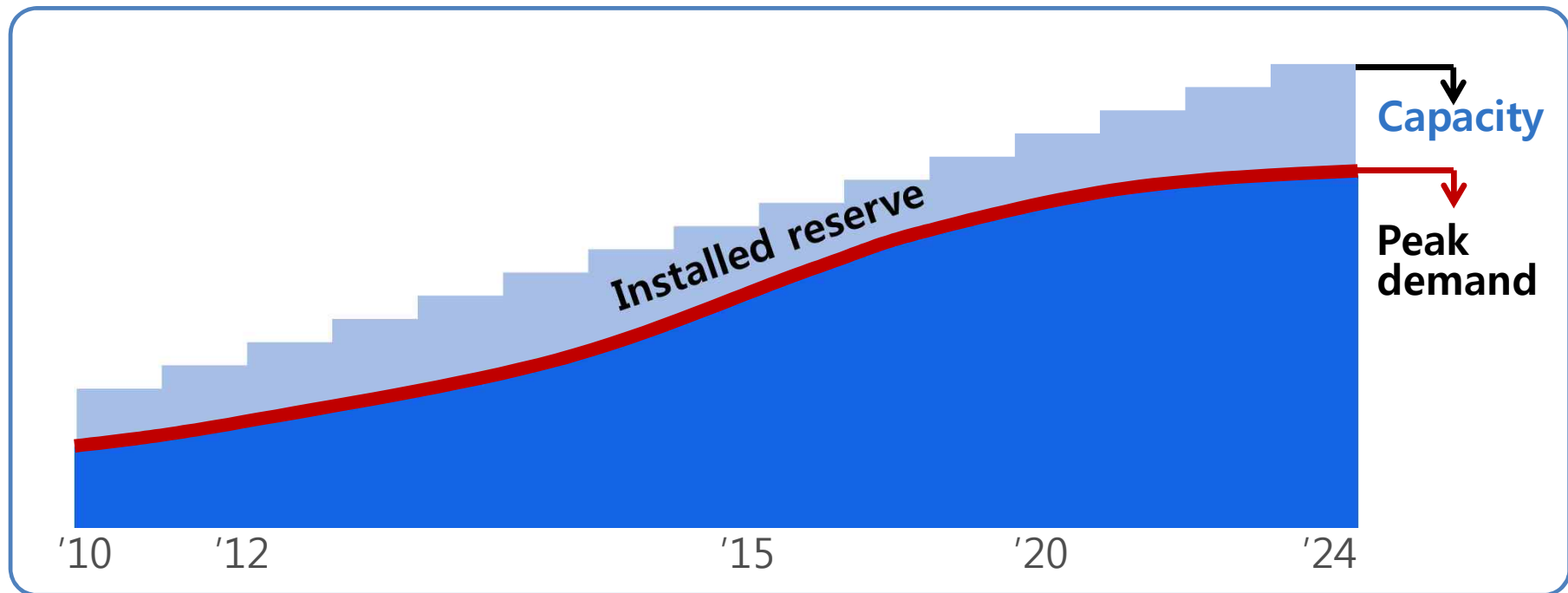
- **SMP Trend**



# Power Planing

“Long-term electricity facility expansion plan  
For Meeting the increase of future demand”

“Establish long-term generation and transmission  
Expansion plan in every 2yr (15yr-horizon)”



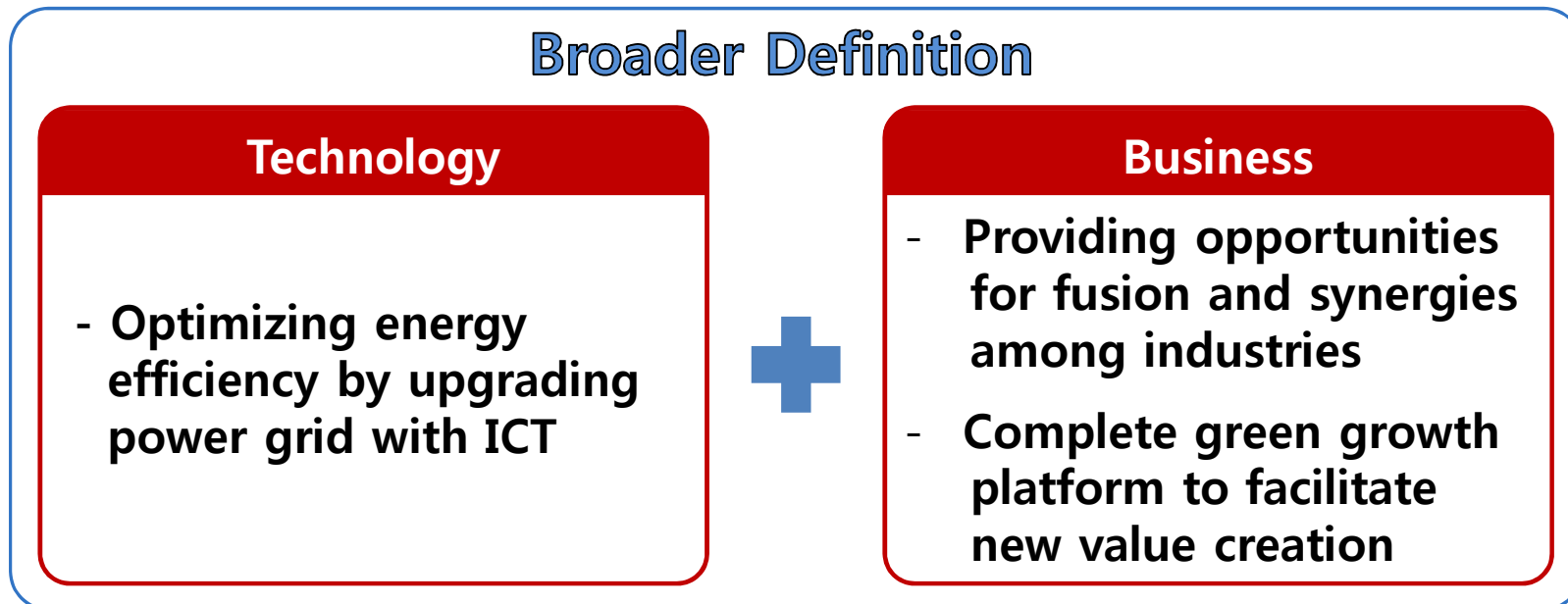
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# Smart Grid in Korea



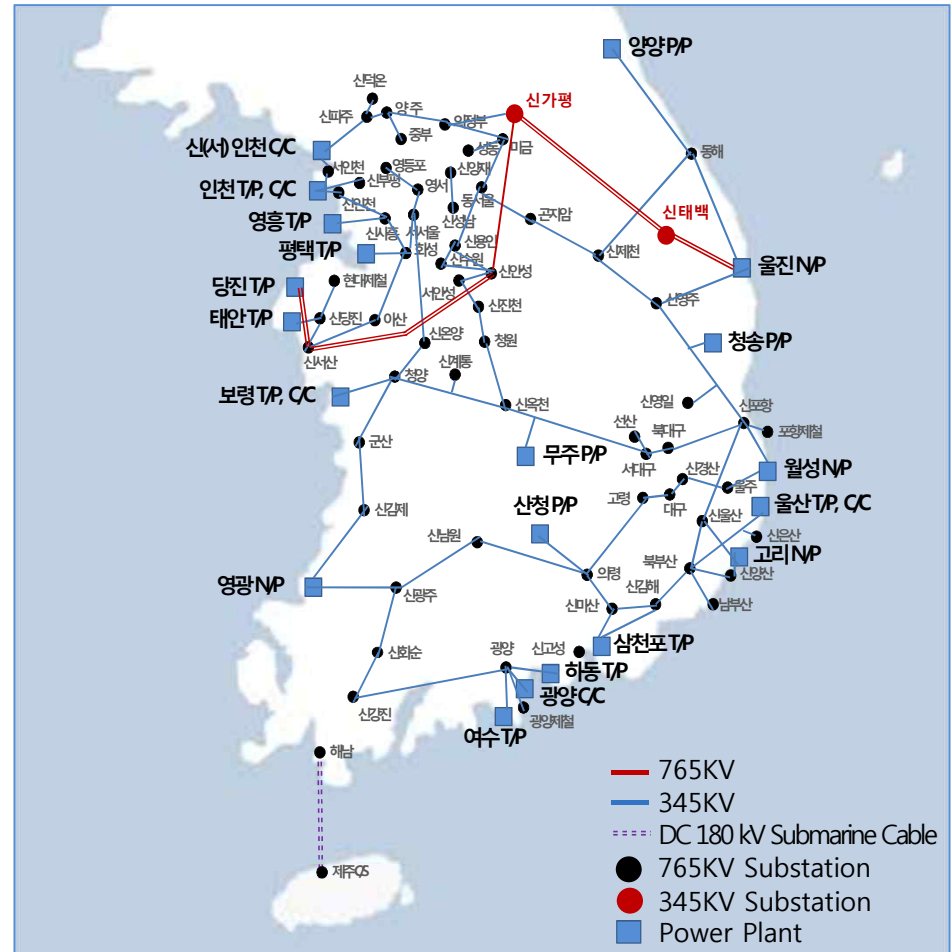
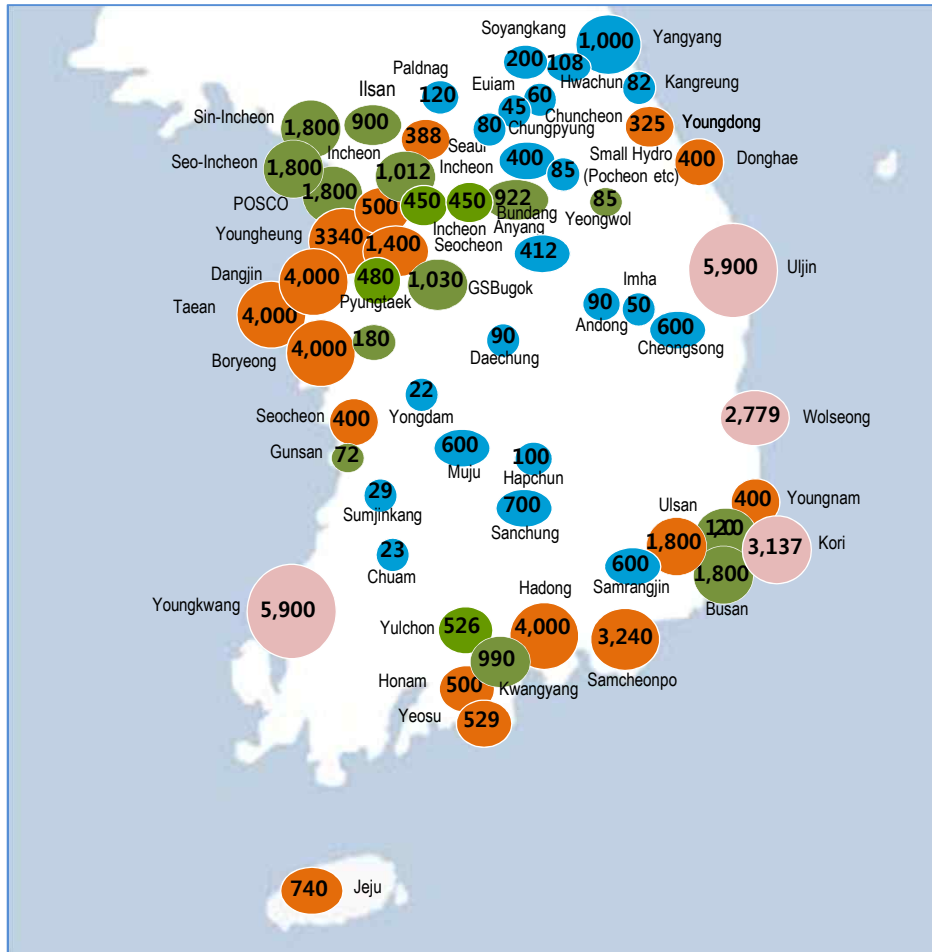
# Concept

- Not just limited to build intelligent grid,
- But also expands into new value creation from the national business perspective.



## Smart Grid in Korea

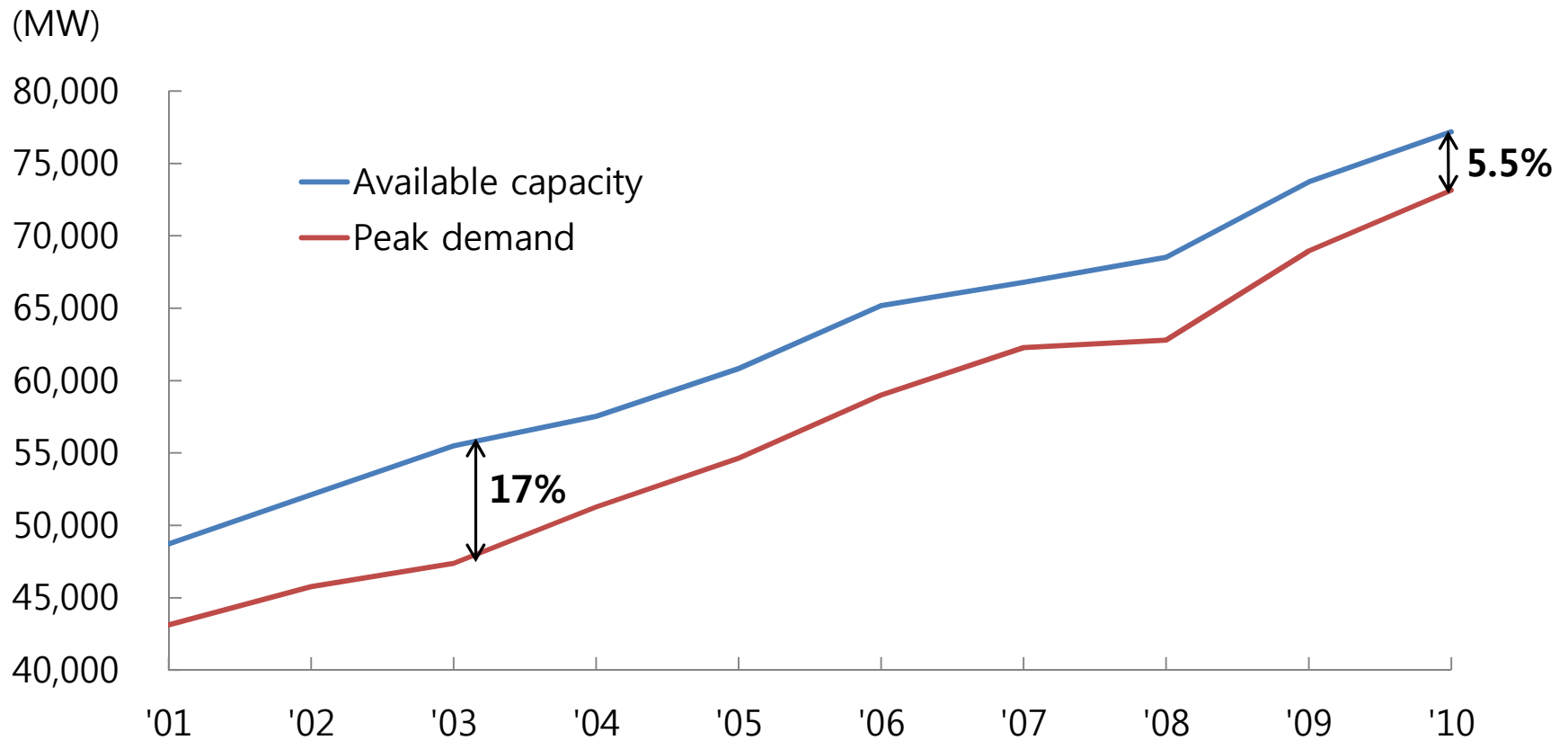
# Why Smart Grid?



# Why Smart Grid?

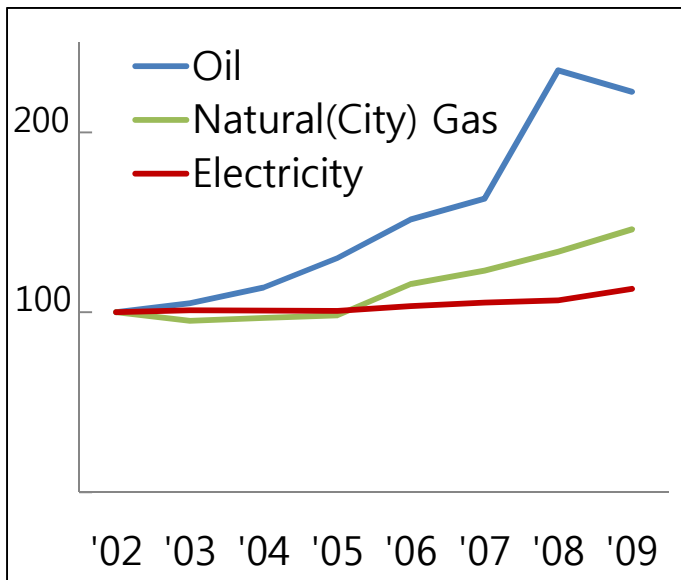


# Why Smart Grid?

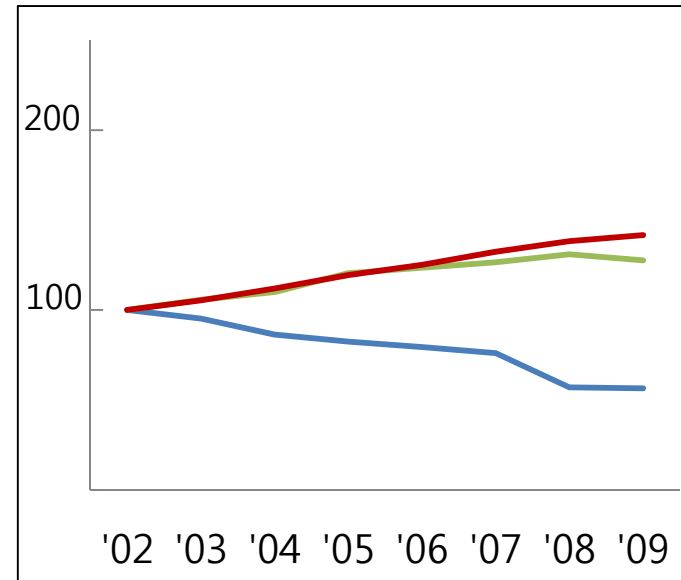


# Why Smart Grid?

- **Energy Prices and Consumption Trend('02-'09)**



**Energy Price Trend**



**Consumption Trend**

Oil 123%	↑↑↑
Natural Gas 46%	↑↑
Electricity 13%	↑

Oil 43%	↓↓↓
Natural Gas 28%	↑
Electricity 42%	↑↑

# Why Smart Grid?

“Using bottled water for the laundry”



Electric heater



Electric cook-top

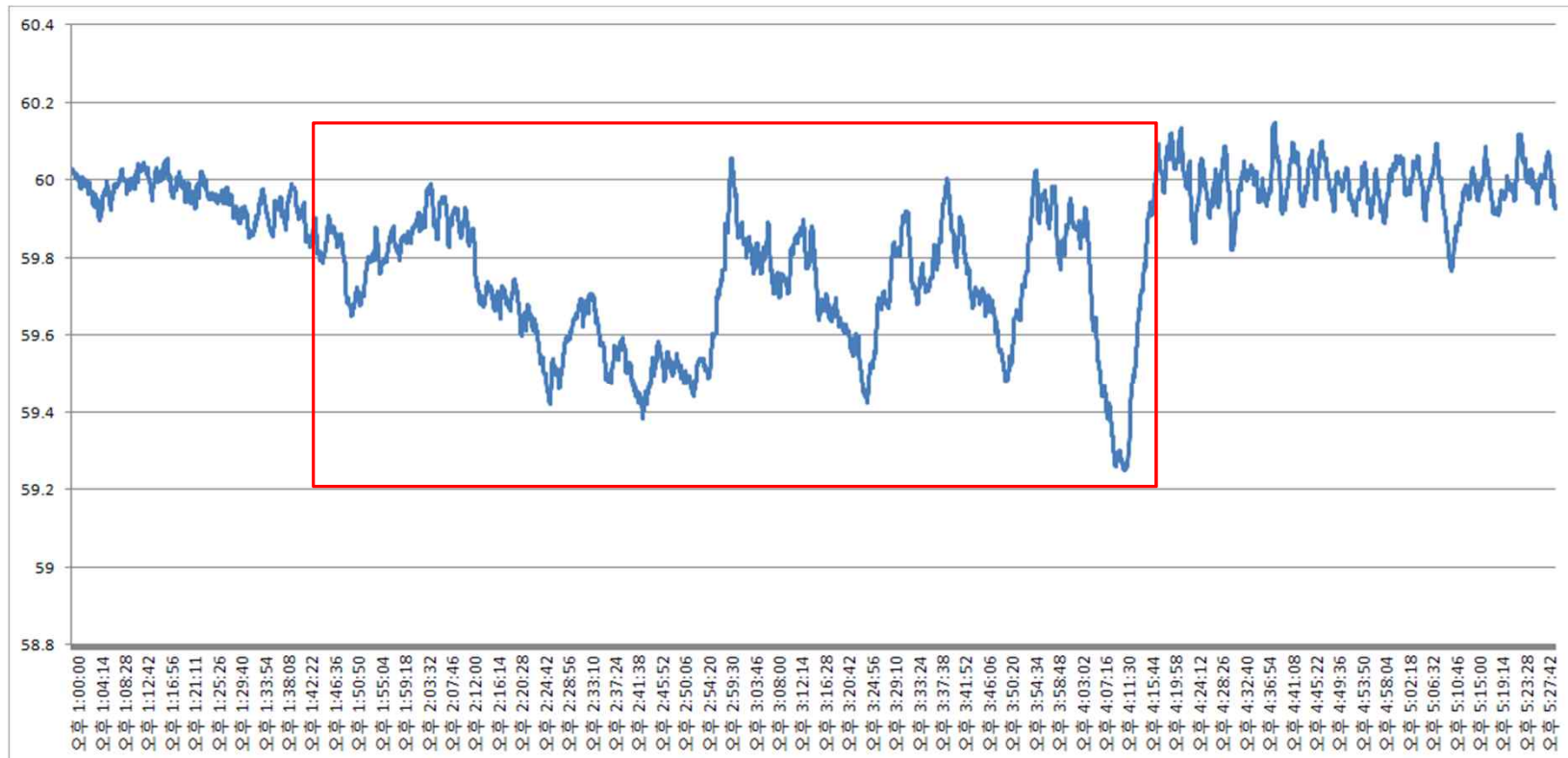


Electric fan heater

- Penetration rate of electrical appliances

	1997	2002	2004	2006	2009
Electric mat	0.22	0.30	0.31	0.40	0.55
Electric cook-top	-	-	-	-	0.10

# Why Smart Grid?



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# Key Developments



# Key Developments

- **National Smart Grid Roadmap('10.1)**
- **Jeju Test-bed('09.12~)**
- **Smart Grid Act**
- **ISGAN**

# National Smart Grid Roadmap

vision

Low Carbon, Green Growth Economy Based On Smart Grid

Key Objectives

SG Pilot City

Phase I (~2012)

Completion of Consumer Smart Grid

Phase II (~2020)

Completion of National Smart Grid

Phase III (~2030)

5 Domains

Smart Power Grid

- Open Power Platform
- Fault Forecasting Self-Heal

Smart Consumer

- Smart AMI
- Auto HEMS

Smart Transportation

- National EV Charging Infrastructure
- V2G & ICT Service

Smart Renewable











- Maximum Renewable Expansion
- Net-Zero Home & Building

Smart Power Market

- Various Tariff Including RTP, CPP, etc.
- Smart Energy Trade

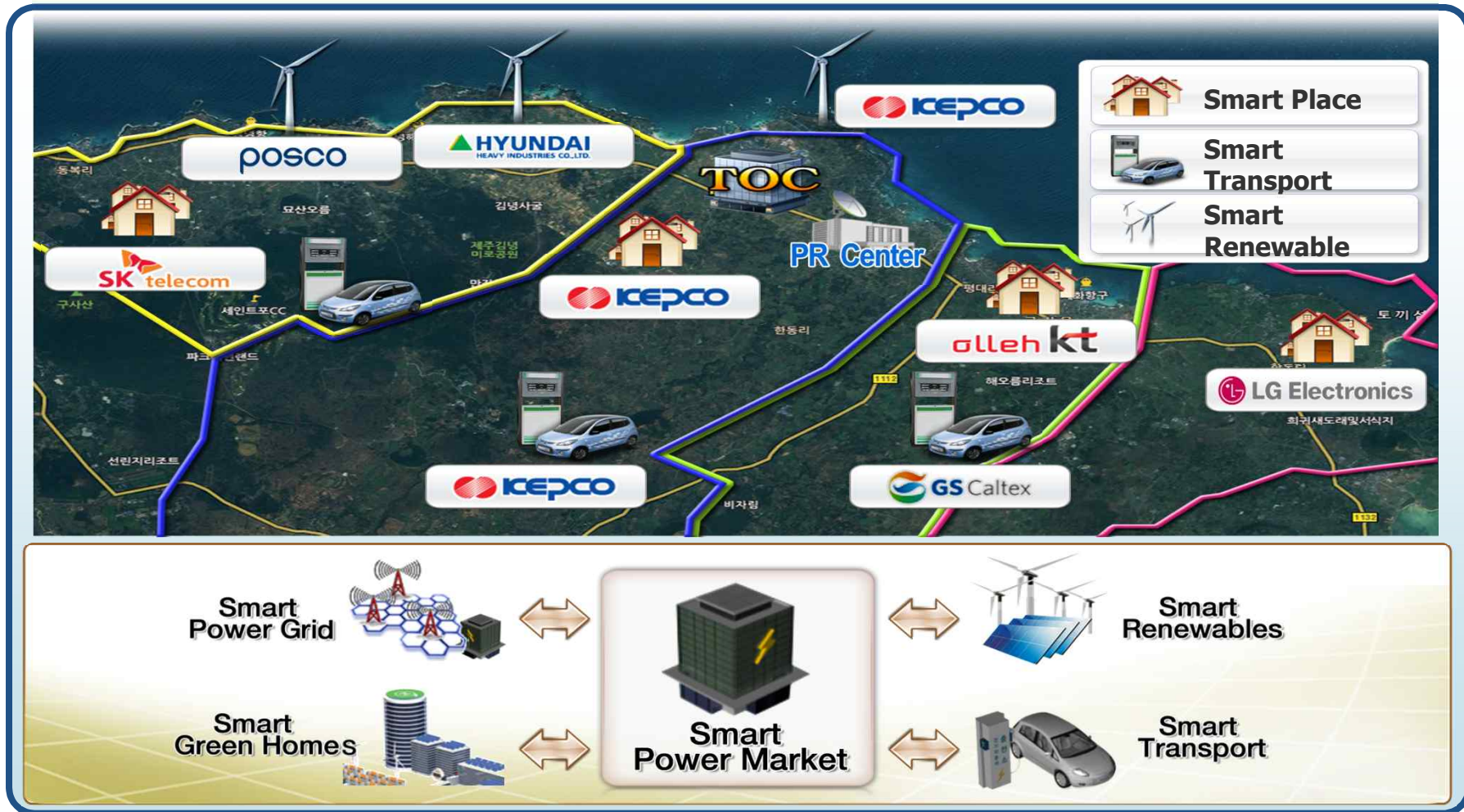
# Jeju test-bed

(Million dollar)

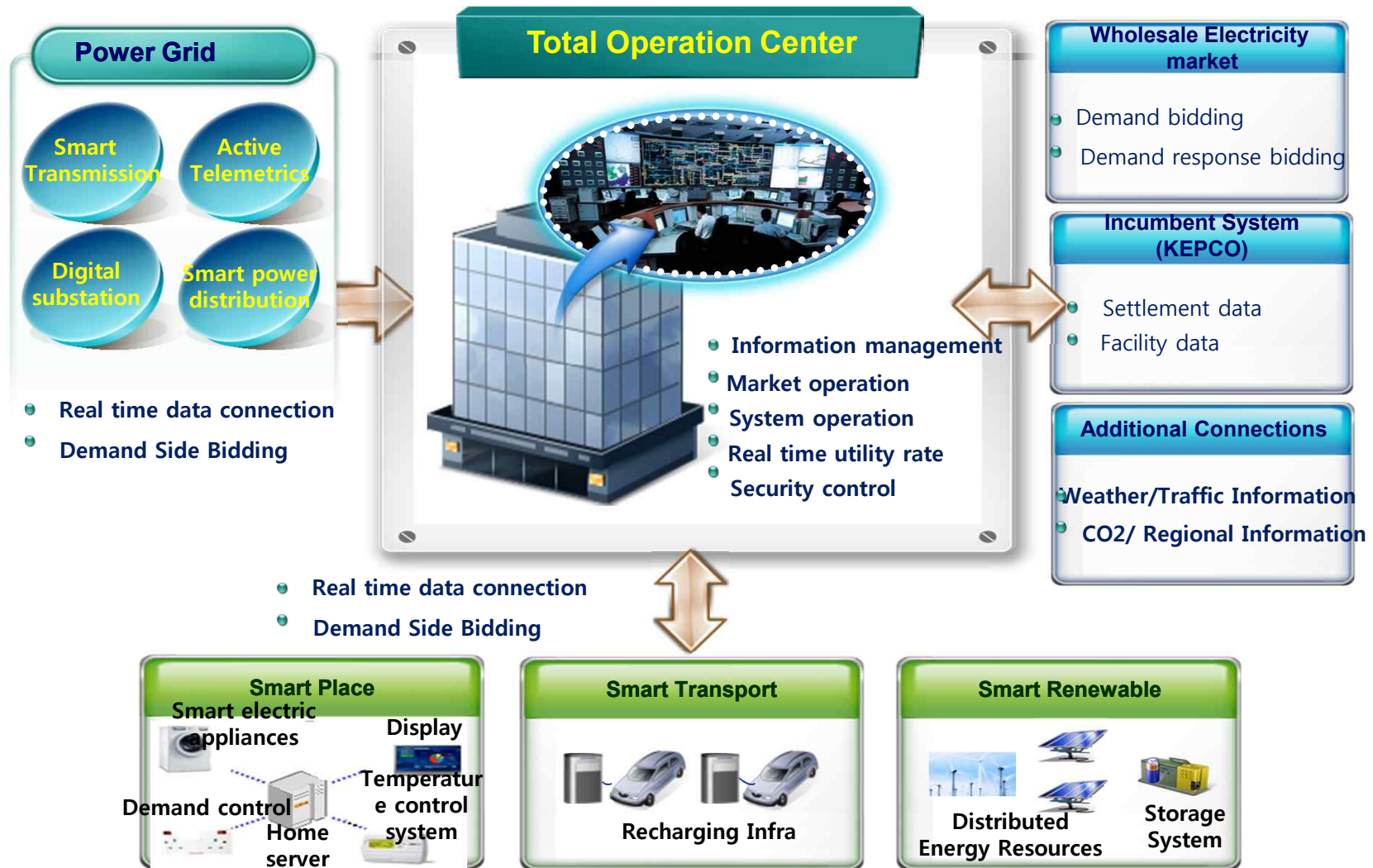
Sector	Leads	Participating Companies	Investment	
			Govt.	Private
Smart Place	 SK telecom	Samsung electronics, Korea Cable TV, Jeju broadcast etc (29)	5	25
	 olleh kt	Samsung SDS, Samsung Trade, Rootech etc (14)	4.7	30
	 LG Electronics	LG U+, GS pure cell, GS construction etc (15)	4.7	17.5
	 KEPCO	Samsung electronics, Taihan Electric, Nuri Telecom etc (38)	-	10
Smart Transport	 KEPCO	Samsung SDI, Lotte data communication, P&E Solution etc (22)	4.5	14
	 SK energy	SK Network, Iljin Electrics, Ientech etc (13)	4.5	13
	 GS Caltex	LG CNS, ABB Korea, NexCon Take etc (7)	4	8
Smart Renewable	 KEPCO	KOSPO, Hyosung, LSIS etc (16)	4.7	15.3
	 HYUNDAI HEAVY INDUSTRIES CO., LTD.	Maxcom, Icellkorea etc (6)	4.7	7
	 POSCO ICT	LG Chem, Woojin Industrial System etc(6)	-	9

※ ( ) : No. of participating companies

# Jeju Test-Bed



# Jeju Test-Bed



# Smart Grid Act

## ▶ Background

## ▶ Key Articles

- National Implementation Plan
- New SG Service Provider
- Investment Support
- Expansion of Smart Grid City
- R&D, International Cooperation
- Information, Cyber Security
- Interoperability
- Standard, Verification



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# Review and Current Issues



# Review on the past progress (1)

- **Public Awareness on SG**
  - SG Roadmap & SG Act
- **Private Investment from Various Industries**
  - Jeju Test-bed & Korea Smart Grid Week
- **Global Leadership**
  - ISGAN, MEF Roadmap, Korea-Illinois SG Initiative



**“National Consensus Building on Smart Grid  
as the Key Infrastructure for Green Economy”**

## Review on the past progress (2)

However, business uncertainty still remains large



- **Expanding Jeju Test-bed business**
  - Area Expansion, Test-bed Rule Making, Interoperability Improvement, Visitor Center
- **Opening More Opportunities for SG Business**
  - Introduction of Economic DR, Pilot Dynamic Tariff for Residential Customer, CES Business Expansion
- **Expanding SG Infrastructure Foundation**
  - Smart Meter/IHD, AMI Policy, EV Charging Standard, EV Safety Improvement, Smart BEMS(K-MEG)

# Current Status

- **Phase II of Jeju Test-bed started in June**
- **New test area includes other parts of Jeju**
- **More dynamic pilot tariff will be introduced**
- **Pilot DR programs will begin next year**

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# Conclusion

# Implication

- **Price-responsive demand is the first and most important step of the successful smart grid.**
- **Smart Grid should follow the customers, not vice versa.**

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# Thank You for Your Listening