

Korea's NRE Status, Priority and Future Strategy

August. 2011

Sang Keun YU (Gavin)
New & Renewable Energy Policy Dept.
New and Renewable Energy Center
Korea Energy Management Corporation(KEMCO)

Coverage

- I Korea's Energy Status
- II Achievements and Assessments
- III NRE Vision and Future Strategies
- IV National NRE Programmes



I Korea's Energy Status

Energy Situation

Energy Consumption

10th biggest energy consumer in the world (227 Mtoe)

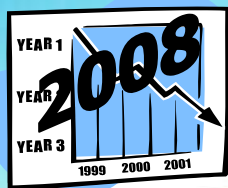
Crude Oil Import

5th biggest importer, 85.9 billion USD (accounting for 61% of all energy import)

- 96% of Energy is imported

CO2 Emission

10th biggest Emitter in the world, 489Mtoe



▶ 'Low carbon, Green growth' national new vision initiated (Aug. 2008)

- 11% of NRE share in TPES by 2030, NRE Industrialization, Export Promotion etc.

NRE in Korea

NRE Resources

- RE – Transform natural resources such as sunlight, water and biomass into usable energy sources
- 8 sources : PV, Solar Thermal, Wind, Waste, Bio(LFG, Bio-Fuels), Hydro, Geothermal, Marine
- New Energy : conventional fossil fuels processed and used as cleaner energy sources
- 3 sources : Fuel-cell, Hydrogen, Coal Liquefaction or Gasification
- NRE Share in TPES(%) : `04: 2.08 / `05: 2.13 / `06: 2.24 / `07: 2.37 / `08: 2.43 / `09: 2.5

Status of NRE Actual Deployment in 2009 (Unit: %)

Solar Thermal	PV	Wind	Bio	Hydro	Geo thermal	Fuel Cell	Waste
0.5	2	2.42	9.5	9.97	0.36	0.32	74.89

Share of NRE Deployment

(Unit: Thou, TOE, %)

	Solar Thermal	PV (Photo-voltaics)	Wind	Bio	Hydro	Geo-thermal	marine	Waste	Total	Primary Energy (MTOE)	Share
2015	63 (0.5)	313 (2.7)	1,084 (9.2)	2,210 (18.8)	1,071 (9.1)	280 (2.4)	393 (3.3)	6,316 (53.8)	11,731	270	4.33%
2020	342 (2.0)	552 (3.2)	2,035 (11.6)	4,211 (24.0)	1,165 (6.6)	544 (3.1)	907 (5.2)	7,764 (44.3)	17,520	287	6.08%
2030	1,882 (5.7)	1,364 (4.1)	4,155 (12.6)	10,357 (31.4)	1,447 (4.4)	1,261 (3.8)	1,540 (4.7)	11,021 (33.4)	33,027	300	11.00%
Annual Increase (%)	20.2	15.3	18.1	14.6	1.9	25.5	49.6	4	7.8	0.9	

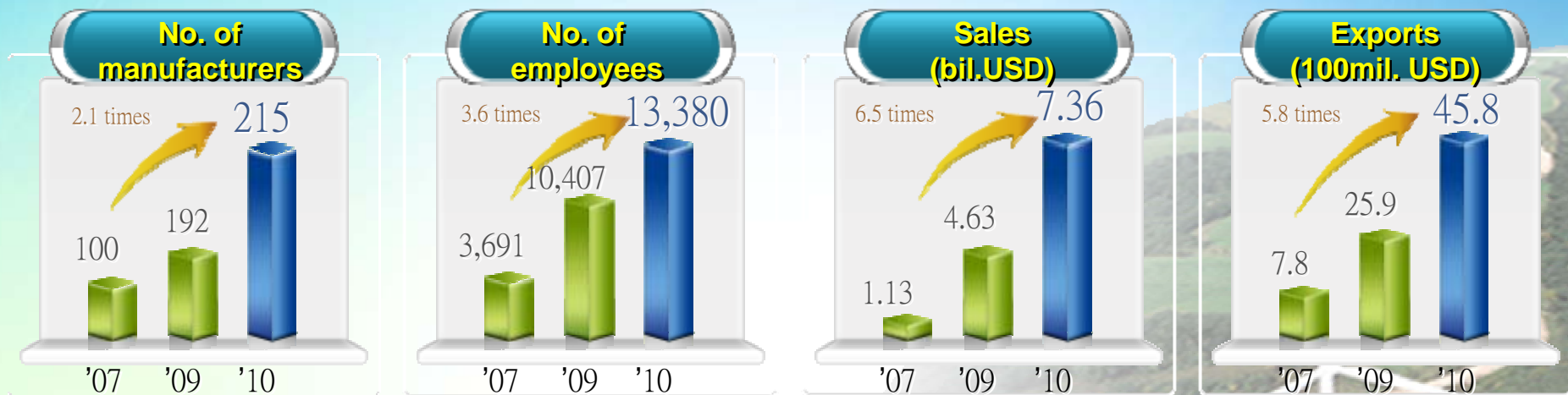


Achievements and Assessments

Achievements



○ Regarded as the main source of SMEs' growth & Jb Creation & a new profitable area of large conglomerates

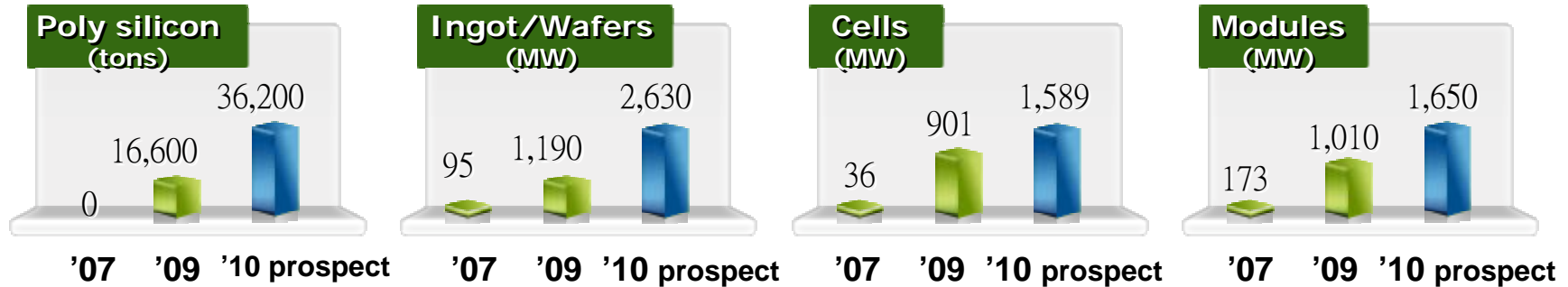


PV

Existing industrial ecosystem

Foster the **Second semiconductor industry** based on the mutual development of large and Small companies and job creation

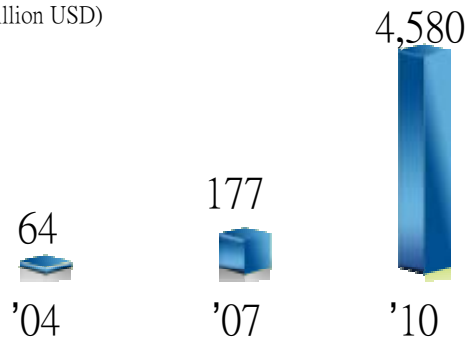
New era of GW scale power production by an integrated production system from Poly silicon to system



Increasing exports in all areas such as materials and modules including Equipment exports and turnkey orders

Exports

(unit: Million USD)



Equipment Export

- Jusung Engineering (130mil.USD to China), Toptech(14.5mil.USD to China)

Contract of PV plant orders

- Samsung C&T Corp.(500MW Canada, 130MW US)
- SDN(45MW Bulgaria)
- Hyundai heavy Industries Co.(175MW US)

Wind

Model sector for SME-LE to co-prosper

A high potential of becoming the Leading group combined with key industries

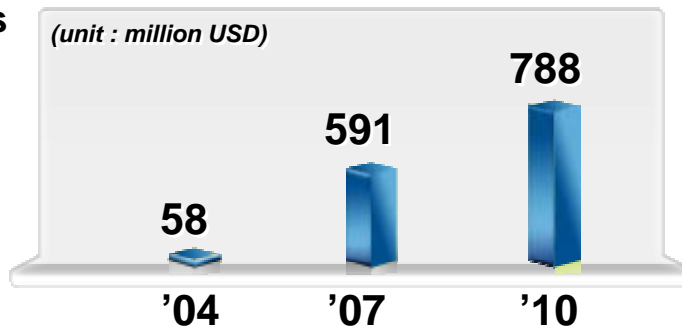
Growing up as the 2nd shipbuilding industry

Industrial structure building with collaboration between SMEs for components & large enterprises for finished goods

Category		Major companies
Parts	Blade	KM, Deck, Doha Industry, GwangdongFRP, HwashinFRP
	Tower	DongkukS&C, Unison, CS wind, Speco, Win&P
	Component	Taewoong, Pyungsan, YonghyunBM, Hyunjin Materials, Unison, Mysco
System		Doosan, Hyundai, Hyosung, STX, Samsung heavy industries, DSME

Trends towards increasing exports of wind power system as well as tower & machined parts

Exports



Contracts of wind power orders

- Hyundai heavy industries (Pakistan, 1.65MW 30systems)
- STX(The Netherlands, 2MW 25systems)
- Unison(Sri Lanka 750KW 13systems)



National NRE Programs

Subsidy Programs

General Subsidy Programs (1994~)

- ▶ Government subsidizes part of the installation costs of the NRE facilities to enhance NRE deployment and to relieve the end user's cost burden (factories, individual Buildings, Schools)



1 Million Green Homes Program (2009~)

- ▶ In order to help build investment favorable environment in residential area, Government has been expanding existing 100,000 solar roof program to diversify and optimize RE use in residential area. This aims to disseminate 1 million green homes by 2020



Local NRE Deployment Program (1996~)

- ▶ Local governments carry out local-fit eco-friendly NRE deployment program for public buildings and social service facilities, Remote Area's residents etc



Loan & Tax Deduction (1980~)

- ▶ Low interest loan is available
- ▶ Corporation tax deduction : 10% of total investment



Deployment Support Programs

Mandatory Use for Public Buildings (2004 ~)

- ▶ The new construction, expansion and remodeling for public buildings having floor area which exceeds 3,000 square meters or larger, more than 5% of their total construction expenses to be invested in installation of NRE systems



Revision of Obligation Program for Public Buildings (2012 ~)

- ▶ Mandatory Use and Design with NRE of more than 10% of total energy load for new, renovated and expanded public buildings larger than 1,000 square meters

Deployment Support Programs

FIT (Feed in Tariff, 2005 ~)

- ▶ In case of power generated from NRE, the government set standard price for each renewable energy source and supports difference between the standard price and SMP(system marginal price) to help secure NRE's economic feasibility
- ▶ Standard price will be adjusted annually reflecting the change of the NRE market and economic feasibility of NRE



RPS (Renewable Portfolio Standards, 2012)

- ▶ Introduce RPS in 2012 that is to obligate utility companies to produce electricity from renewable energy to certain ratio in their total power production
Companies that have power plants with capacity of more than 500MW
(Currently, establishing management regulation)

* Mandatory NRE ratio : ('12) 2% → ('22) 10%





NRE vision and Future Strategies

Vision 2015

The target to be the world's top 5 nation in NRE market

International market share : PV 15%, Wind 15%



Invest 33 bil.USD (private 28, government 5) by 2015

Implementing Strategies and Tasks

Promoting Strategic
R&D
& Commercialization

1. Localize Innovative technologies for global market

▪ 12.5bil USD invested in key technologies

- PV Cell (Silicon thin film, CIGS thin film, Dye-sensitized, Organic)
- Wind (Large scale offshore complex design, demonstration, operation)
- Fuel-cell (Next generation tech – SOFC etc)
- Bio (Next generation bio-fuel production tech), IGCC tech for export)

2. Build test-beds for technology and product promotion

- 6 test-beds for equipment, inspection, analysis in PV, wind, fuel-cell(2011)

3. Establish a cluster to support SMEs and their technologies

Market Creation to
stimulate
industrialization

1. Promote Top 10 Green Projects (Greenize nationwide)

- **Green Post** (PV, Solarthermal, Geothermal), **Green Port** (Offshore wind, PV), **Green School** (PV, Solarthermal, Geothermal), **Green Island** (PV, Bio, Geothermal), **Green Logistics** (PV, Solarthermal, Geothermal), **Green Industrial Complex** (Fuelcell, Bio, Waste), **Green Highway** (PV, Solarthermal, Geothermal), **Green Army** (Solarthermal, Geothermal, Bio), **Green Factory** (Solarthermal, Fuelcell, Waste), **Green Power** (PV, Wind, Bio)

2. Introduce Innovative Institutions to create market

- RPS(2012~), RFS(2013), Community ownership PV & wind project

Implementing Strategies and Tasks

Facilitating export-oriented industrialization

1. "Top-3 Wind Roadmap" (Oct, 2010)

- **Technology development** → Demonstration → Overseas market penetration
 - ① **Complete large scale offshore wind generator (above 5MW, 2012)**
 - ② **Build 100MW capacity offshore wind demonstration complex (5MW x 20, 2013)**
 - ③ **Extend the complex up to 900MW(2015), 1,500MW(2017), 7,700MW(2019~)**

➔ **World's top 3 wind power nation**

2. Total Support System for overseas market penetration

- **Project Support (Market Study, Project Development, Feasibility Study)**
- **Infra Support (Market Pioneer, Overseas Certificate, Road-show, Exhibition)**
- **Information, Fund (Export Gateway, ODA Fund)**

3. Nurturing top 50 global manufacturers of world NRE market

- **Support SMEs with high potential and innovative tech (focused on wind, PV)**
- **Total Support (R&D + Demonstration + Production + Certification + Export)**
- **Enhanced Incentives (Global Star Companies : R&D, Finance)**

Infrastructure building for private sector growth

1. Financial Support and Tax Incentives

- **NRE credit guarantee fund (83mil USD) → Loan to SMEs (1.3bil USD)**
- **Enlarge tax deduction to global standard(30-50% of corporate income, etc)**
- **Capacity building for NRE specialized workforce (researcher, technician, university student, national certification)**

1. Reform Regulations

- **Direct Grid Connection (Under 20MW)**
- **Fast track approval for NRE project developer**
- **Ease environment impact evaluation for NRE facilities**

Thank you very much

Email: yusk@kemco.or.kr

