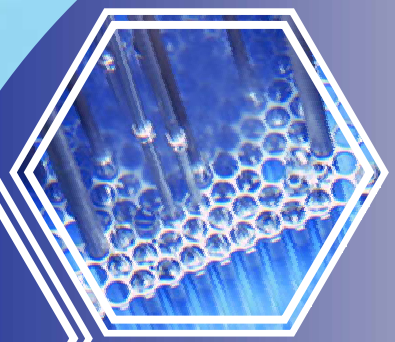

Nuclear Energy in Korea: Past, Present and Next Decades

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- Energy Situation in Korea
- Advantages of Nuclear Energy
- Nuclear Power in Korea
- Issues and Tasks
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40th Anniversary for KNS

- 1st KNS meeting in 1969
- Joined IAEA in 1956
- KAERI: established in 1959
- Education Program started in 1958
  - Dep't Nuclear Eng. Hanyang Univ. in 1958
  - Dep't Nuclear Eng. Seoul Nat'l Univ. in 1959

Introduction

- Important role of nuclear energy in Korea
- Successful & effective establishment of nuclear industry and technology
- Relatively well prepared for the nuclear renaissance
- Several issues to be resolved before harnessing the outcomes of the past wise efforts

Energy Situation in Korea (1)

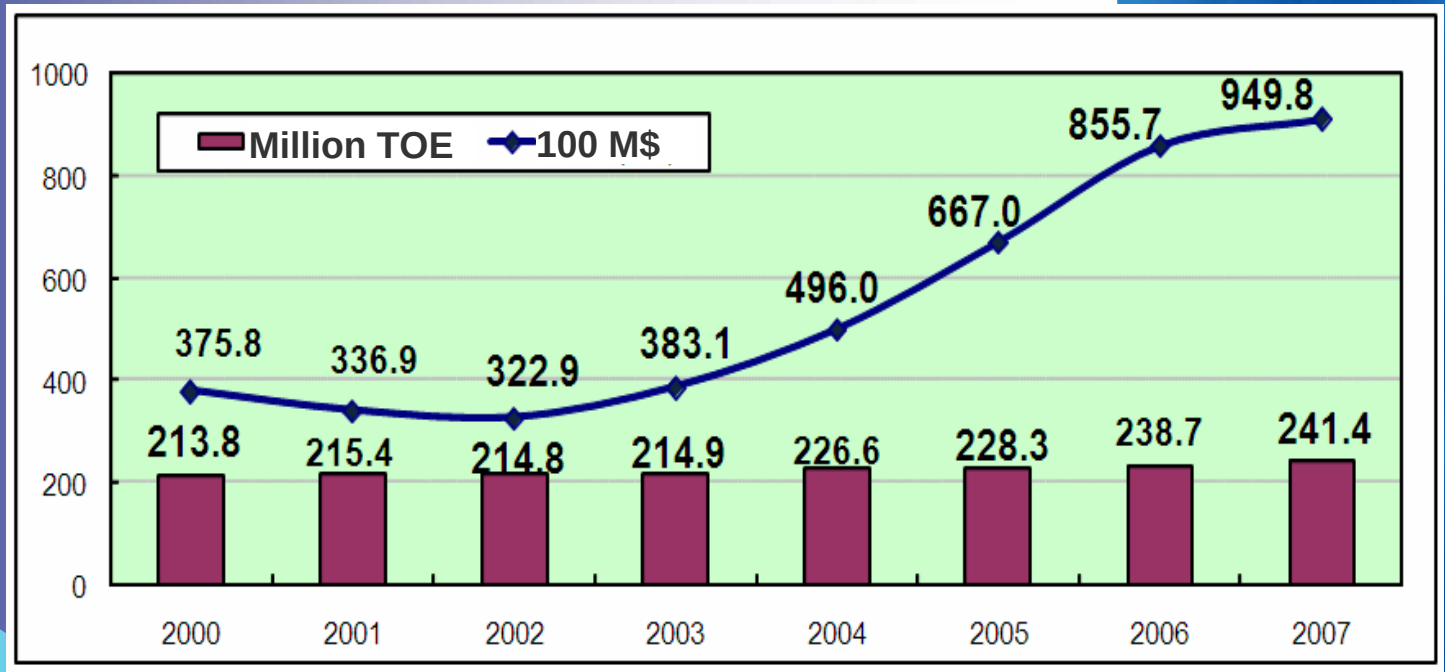
- **High increase rate of energy consumption**
  - **7.5% annual increase in 1990s**
  - **~3% annual increase in 2000s**
- **Decreasing share of oil and coal in primary energy consumption**

Resources	1980	1990	2007
Oil ↓	61.1%	53.8%	43.4%
Coal ↓	30.1%	26.2%	25.3%
LNG ↑	0%	3.2%	13.8%
Nuclear ↑	2.0%	14.2%	14.9%

- **Limited renewable energy sources**

Energy Situation in Korea (2)

- **Continuous increase in energy imports**
  - **Import ~97% of primary energy resources**
  - **World's major energy consumer: No. 10 in total energy consumption; No. 7 in oil consumption; No. 4 in crude oil imports; No. 2 in LNG and coal imports**



Energy Situation in Korea (3)

- Highly unstable energy prices: high oil prices since 2003
- Increased importance of energy security
- Difficulty in developing overseas energy resources
- Need to decrease greenhouse gas emissions

Energy Situation in Korea (4)

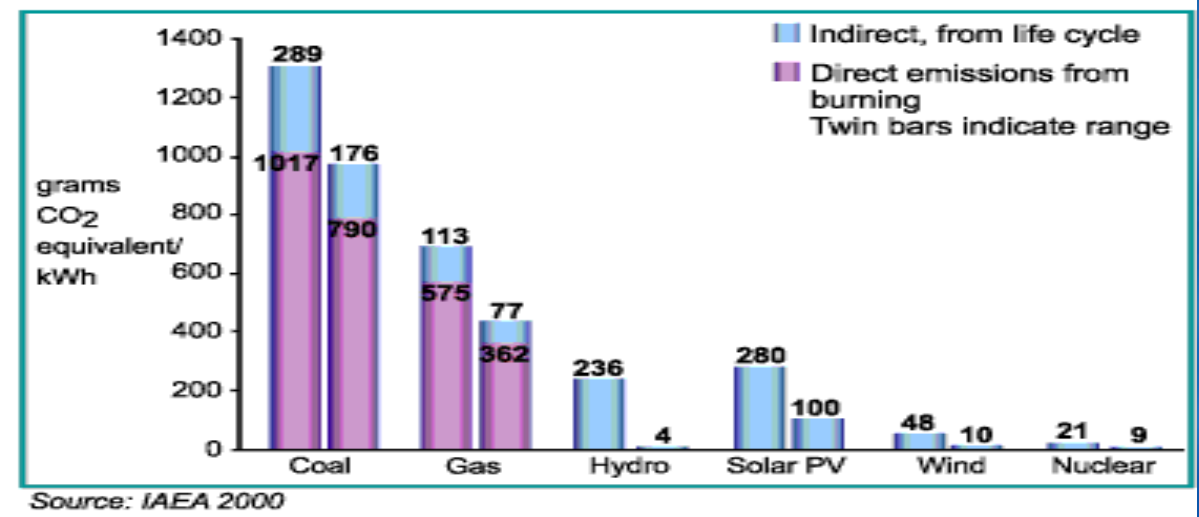
Directions to Resolve Energy Problems

- Reduce the dependency on foreign energy supply
- Transform to the low energy consumption society
- Expand the development and utilization of new and renewable energy sources
- Strengthen the capability to cope with the UNFCCC

➔ Low-Carbon Green Energy Technology

Advantages of Nuclear Energy (1)

- **Most practical low-carbon energy that can mitigate the climate change issue**



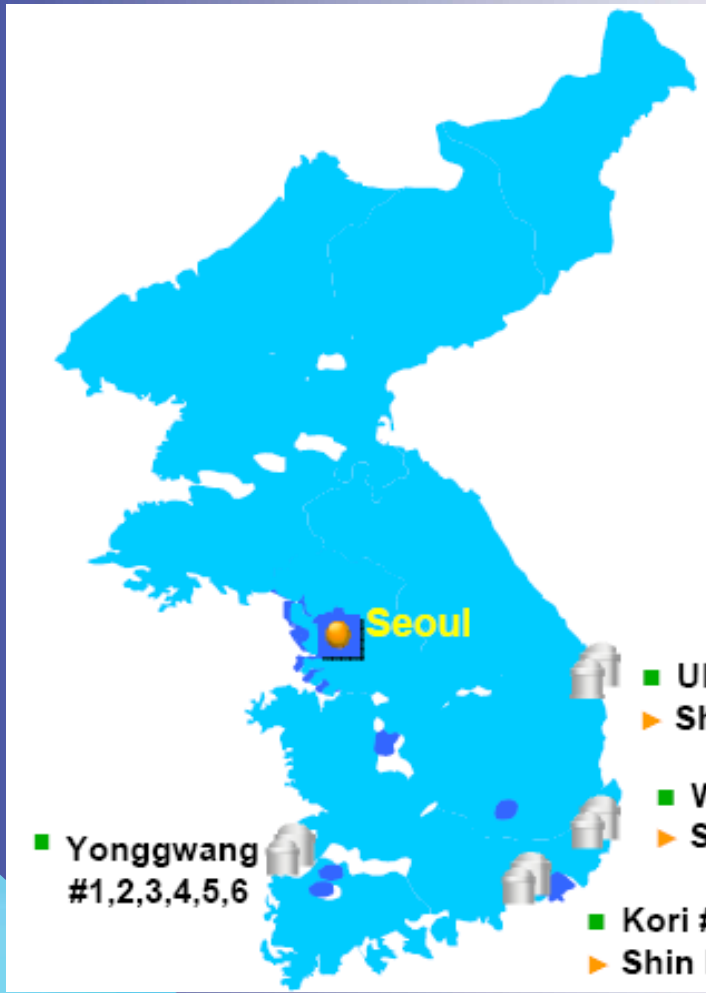
- **Clean energy that does not emit air- or land-pollution materials**
- **High-density energy that enables and effective use of land**

Advantages of Nuclear Energy (2)

- Technology-based semi-domestic energy source that contributes to the national & regional economy
- Large-scale energy source that has been commercially verified
- Lowest electricity generation cost that is the major contributor to the low electricity price in Korea
- Contribution of nuclear industry to the national economy (domestic construction, exports, etc.)

Status of Nuclear Power in Korea (1)

- **NPPs in Operation & Under Construction**

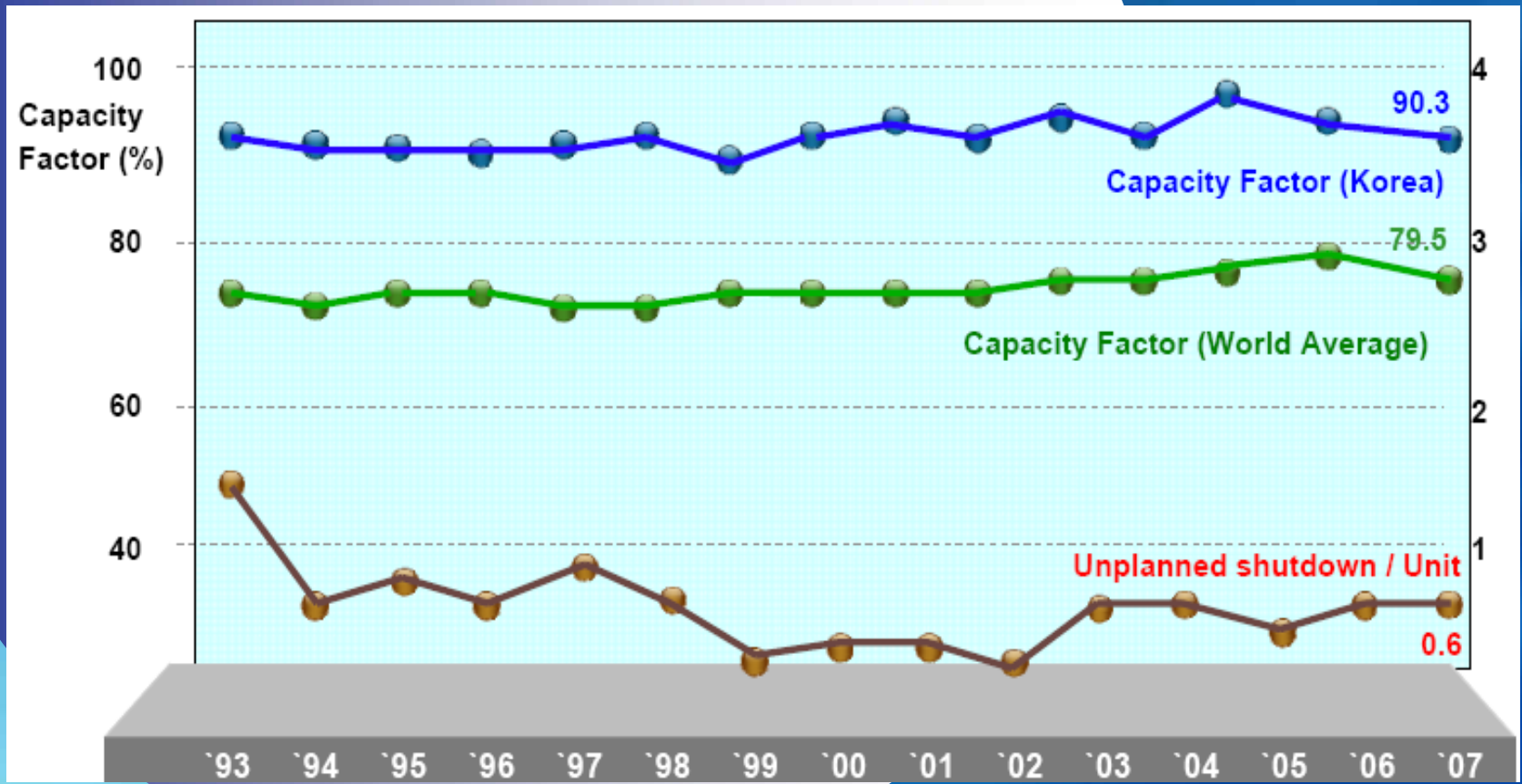


(As of Dec. 31, 2007, Units: MW)

Site	In Operation	Under Const.	Total
Kori	4 (3,137)	4 (4,800)	8 (7,937)
Wolsong	4 (2,779)	2 (2,000)	6 (4,779)
Yonggwang	6 (5,900)	-	6 (5,900)
Ulchin	6 (5,900)	2 (2,800)	8 (8,700)
Total	20 (17,716)	8 (9,600)	28 (27,316)

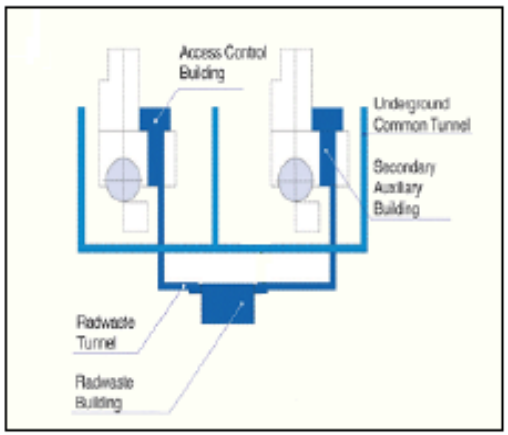
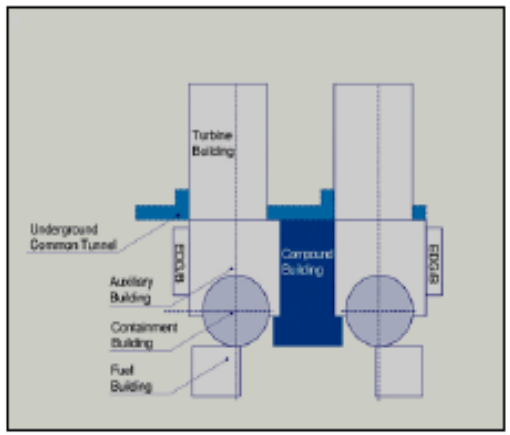
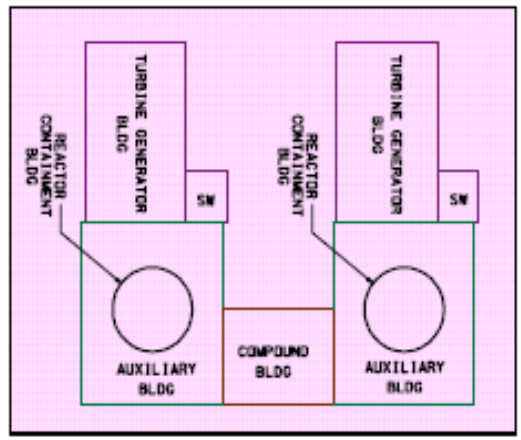
Status of Nuclear Power in Korea (2)

- **Excellence in NPP Operation**



Status of Nuclear Power in Korea (3)

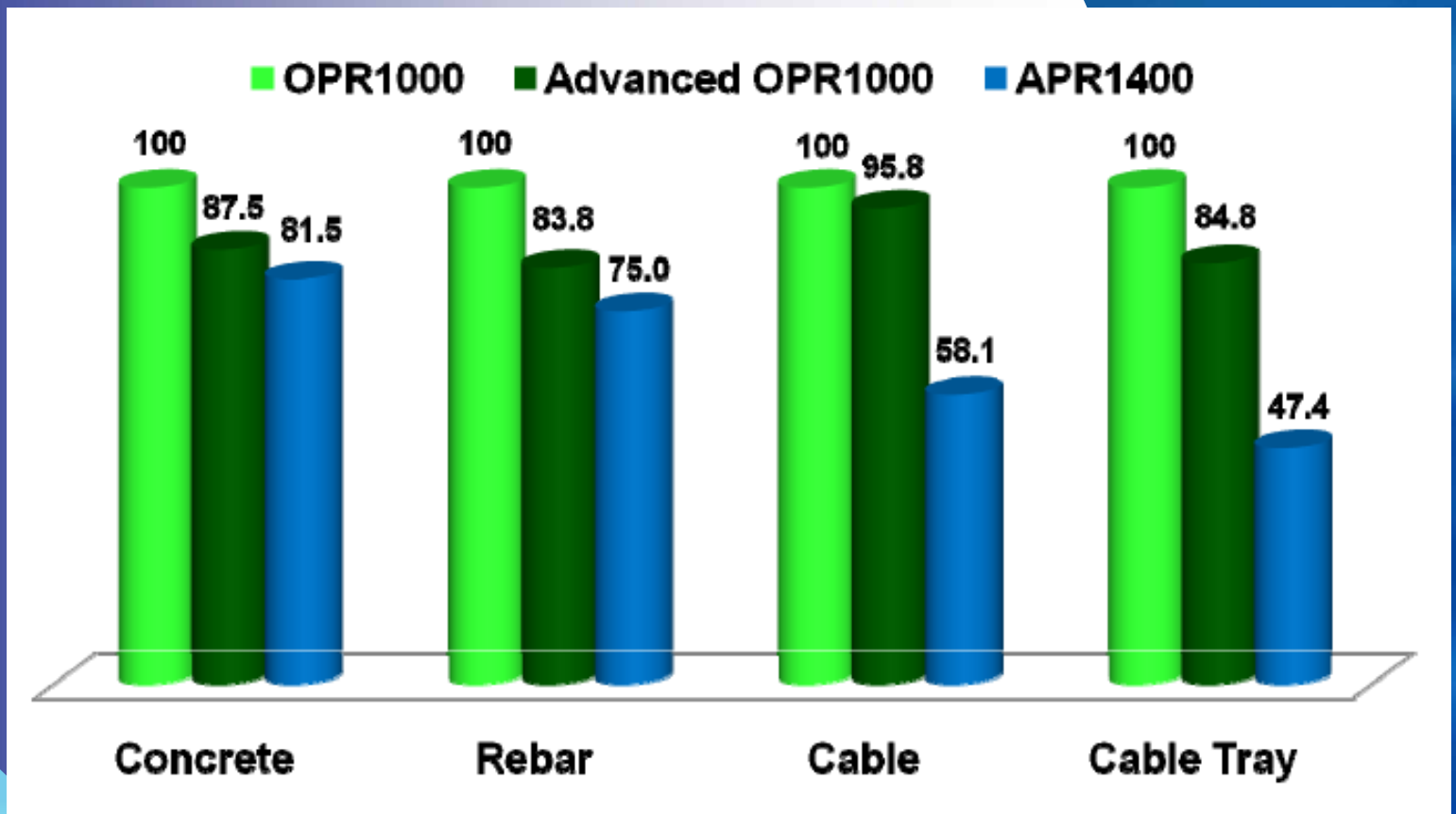
- **Competitive NPP designs**

OPR1000	Improved OPR1000	APR1400
		
• UCN #3,4 • YGN #5,6 • UCN #5,6	• SKN #1,2 • SWN #1,2	• SKN #3,4 • SUN #1,2

(note: not scaled)

Status of Nuclear Power in Korea (4)

- **Competitive NPP designs**

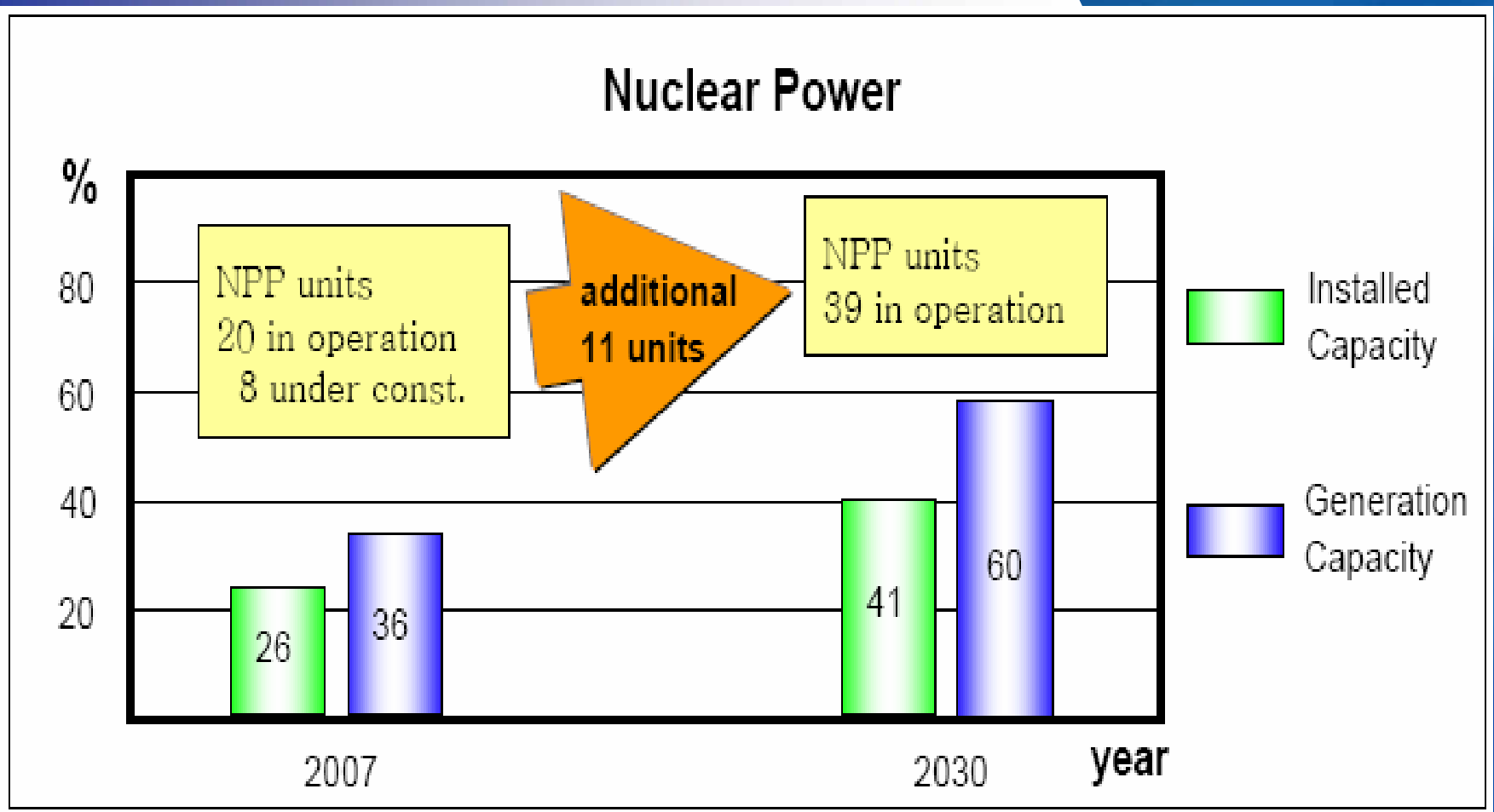


Status of Nuclear Power in Korea (5)

- Strong infrastructure for design, manufacturing & construction of new NPPs

Status of Nuclear Power in Korea (6)

- **National Long-Term Energy Policy (Aug. 2008)**



Issues and Tasks (1)

- **Enhancing Nuclear Safety & Public Acceptance**
  - **Achieve the lowest probability of accident through development of nuclear safety technology, education/training for NPP operators, etc.**
  - **Enhance public acceptance through transparent nuclear policy and NPP operation**
- **Safe Management of Radioactive Wastes**
  - **Safe operation of the low/intermediate-level radwaste repository that is under construction**
  - **Early establishment of government policy for interim storage of spent fuels**
- **Securing New Sites for NPP Construction**
  - **At least 2 new sites required**

Issues and Tasks (2)

- **Financial Resources for NPP Construction**
  - Rationalization of electricity rate
  - Investigation of private financing for NPP construction
- **Technology Development & International Cooperation**
  - Advanced reactor technology for construction home and abroad
  - New reactor development for hydrogen production
  - Strengthening international cooperation and leadership

Issues and Tasks (3)

- **Securing the nuclear fuel materials**
  - **Establishment of the long-term strategy for stable fuel supply**
  - **Active participation in international fuel supply systems**
- **Establishment and Implementation of Long-term Vision of Nuclear Energy**
  - **Long-term policy on nuclear energy utilization**
  - **Strategic policy for strengthening the nuclear industry**

Conclusions

- Nuclear energy in Korea: a success story
- National Energy Plan of Korea: ~60% Share of Nuclear Power in Electricity Generation
- Several challenges in harnessing nuclear renaissance: strong and systematic efforts needed
- International cooperation: an important factor for continued success in the future

Thank You !