



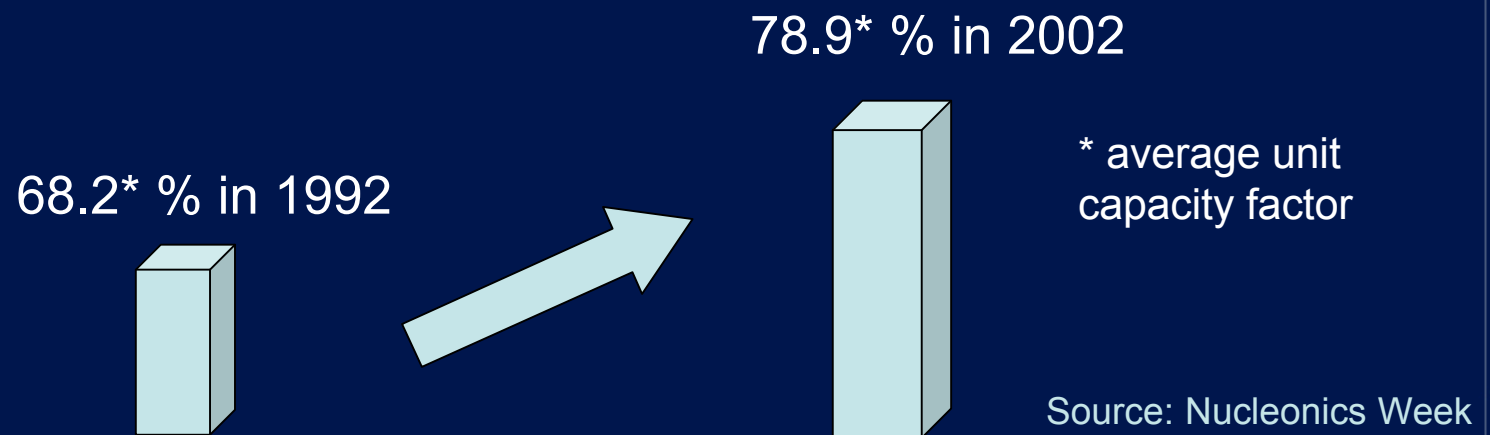
# Near Term Perspectives of Nuclear Power in Korea

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Tai-Sun Kim  
Senior Vice President  
Korea Hydro & Nuclear Power Company

# 1. Introduction

- Today, nuclear power marks more than 11000 RY of experiences
- As experiences accumulate, the performance of nuclear power has improved remarkably



Worldwide Nuclear Power Reliability Improvement

## □ Nuclear Power Around the Pacific Rim

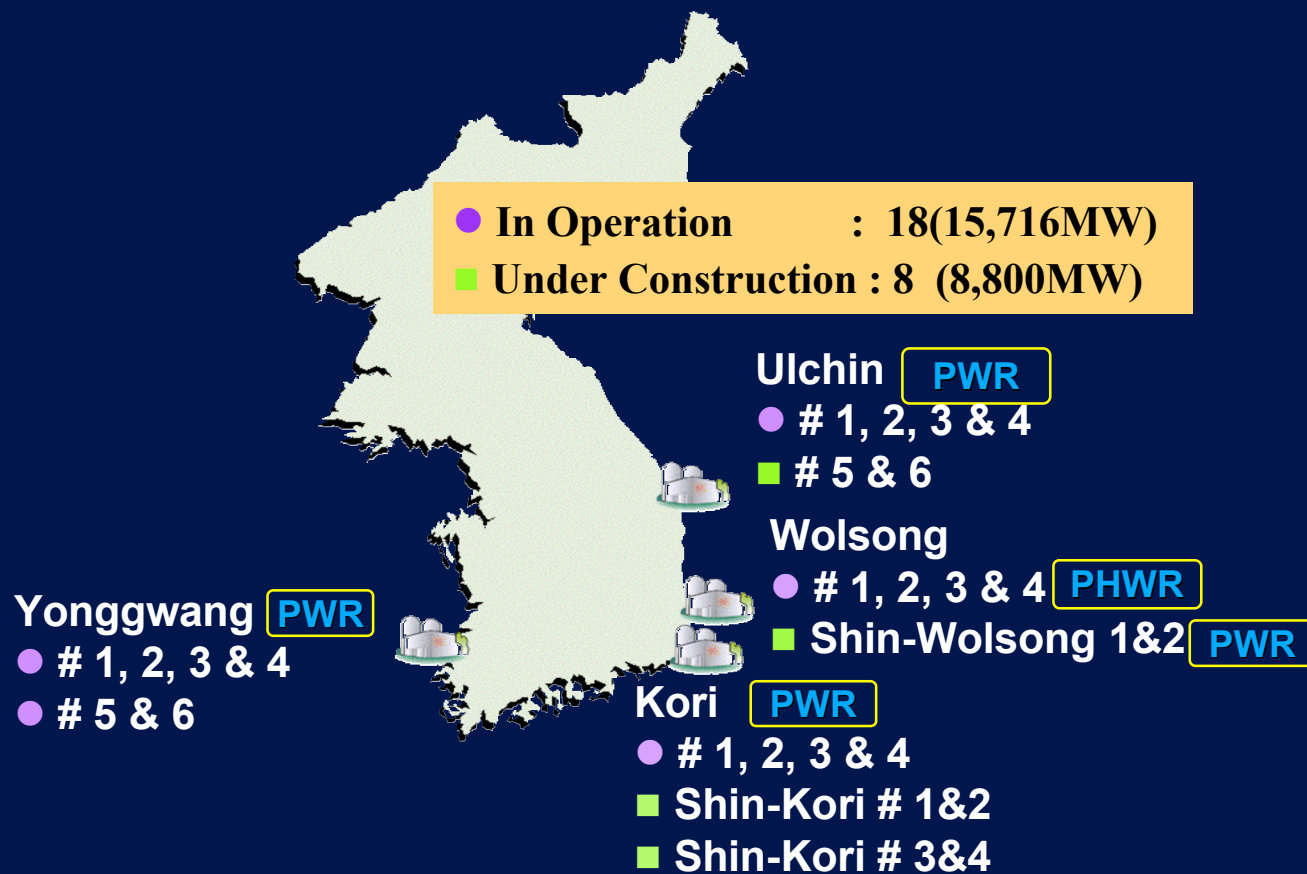
- Nuclear power is considered as an important energy source in many Pacific basin countries.
- However, there appears a wide spectrum of the status in nuclear power.
  - Outstanding improvement in U.S
  - Some setback in Japan and Canada
  - Active development in China
  - Positive movement in south-east basin countries
  - Steady progress in Korea but with growing challenges

## Nuclear Power at a Crossroad

- Nuclear power is being revisited worldwide.
  - Nuclear power has proved its competitiveness and safety.
  - A new construction project was launched and nuclear phase-out policy is reconsidered in Europe.
  - International programs for next generation reactor development is moving forward.
  - In some countries where nuclear power has been well accepted, however, challenges and new issues are growing.

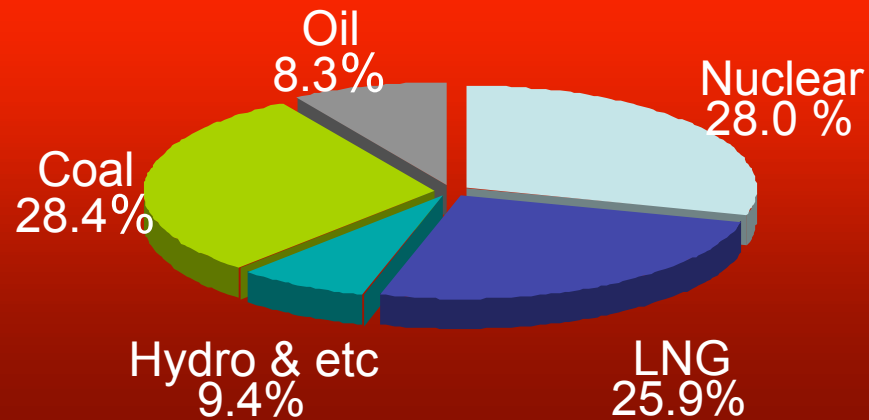
## 2. Status of Nuclear Power in Korea

- Nuclear Power Map of Korea

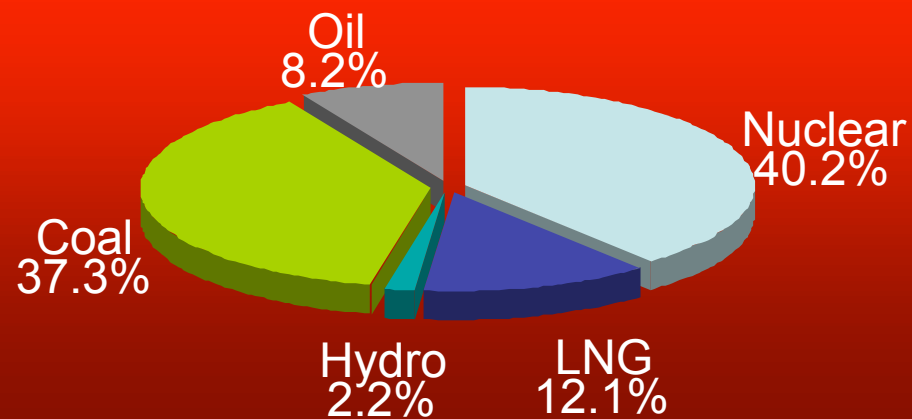


# Shares of Nuclear Power in 2003

## Shares of Installed Capacity



## Shares of Power Generation



## Operation Status : 18 units (15,716 MW)

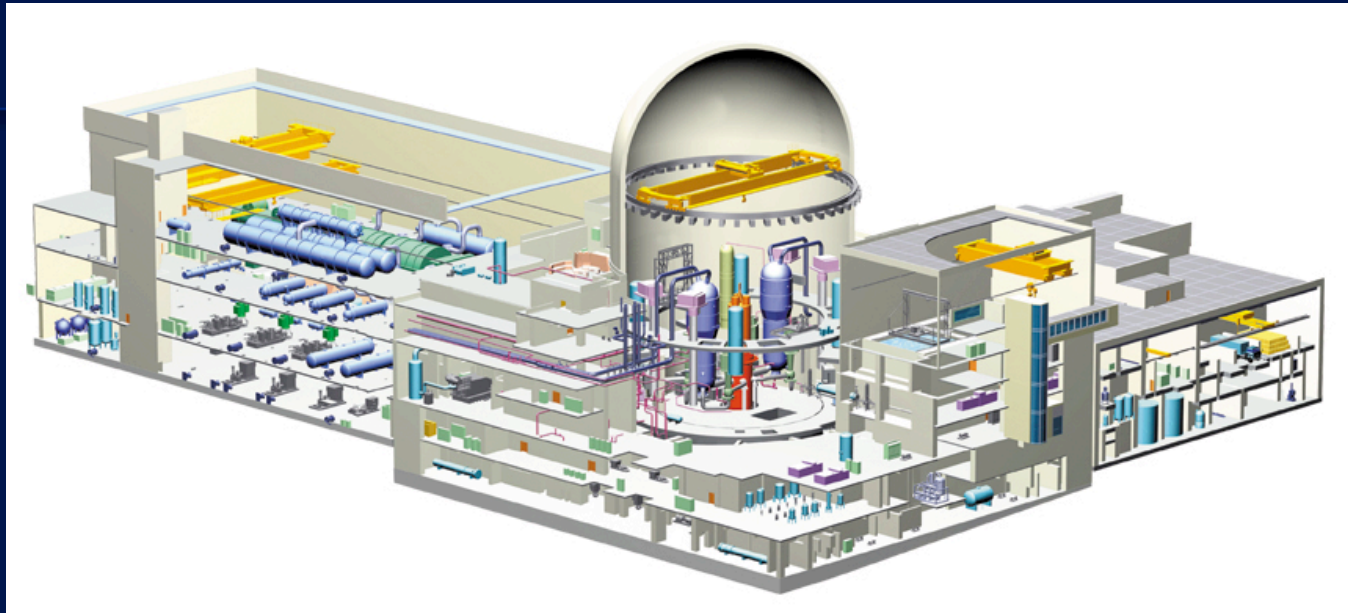
- Nuclear power of Korea has grown to be the 6<sup>th</sup> both in power generation and capacity size in the world.
  - 15.7 GW of capacity and 130 TWH of generation in 2003
- Operational performance is at the top notch.
  - Record high of average capacity factor in 2003 : 94.2 %
  - 12 units over 90 % and all 18 units over 80%
- Keeping outstanding performance records is a best way to respond to controversies on nuclear power.

## Construction Status: 8 Units (8,800MW)

Project		Reactor Type	Capacity (MW)	Plant Type	Commercial Operation
Ulchin	#5	PWR	1000	KSNP	June 2004
	#6	PWR	1000	KSNP	June 2005
Shin-Kori	#1	PWR	1000	KSNP	Dec. 2009
	#2	PWR	1000	KSNP	Oct. 2010
	#3	PWR	1400	APR1400	June 2011
	#4	PWR	1400	APR1400	April 2012
Shin-Wolsong	#1	PWR	1000	KSNP	Sep. 2010
	#2	PWR	1000	KSNP	July 2011



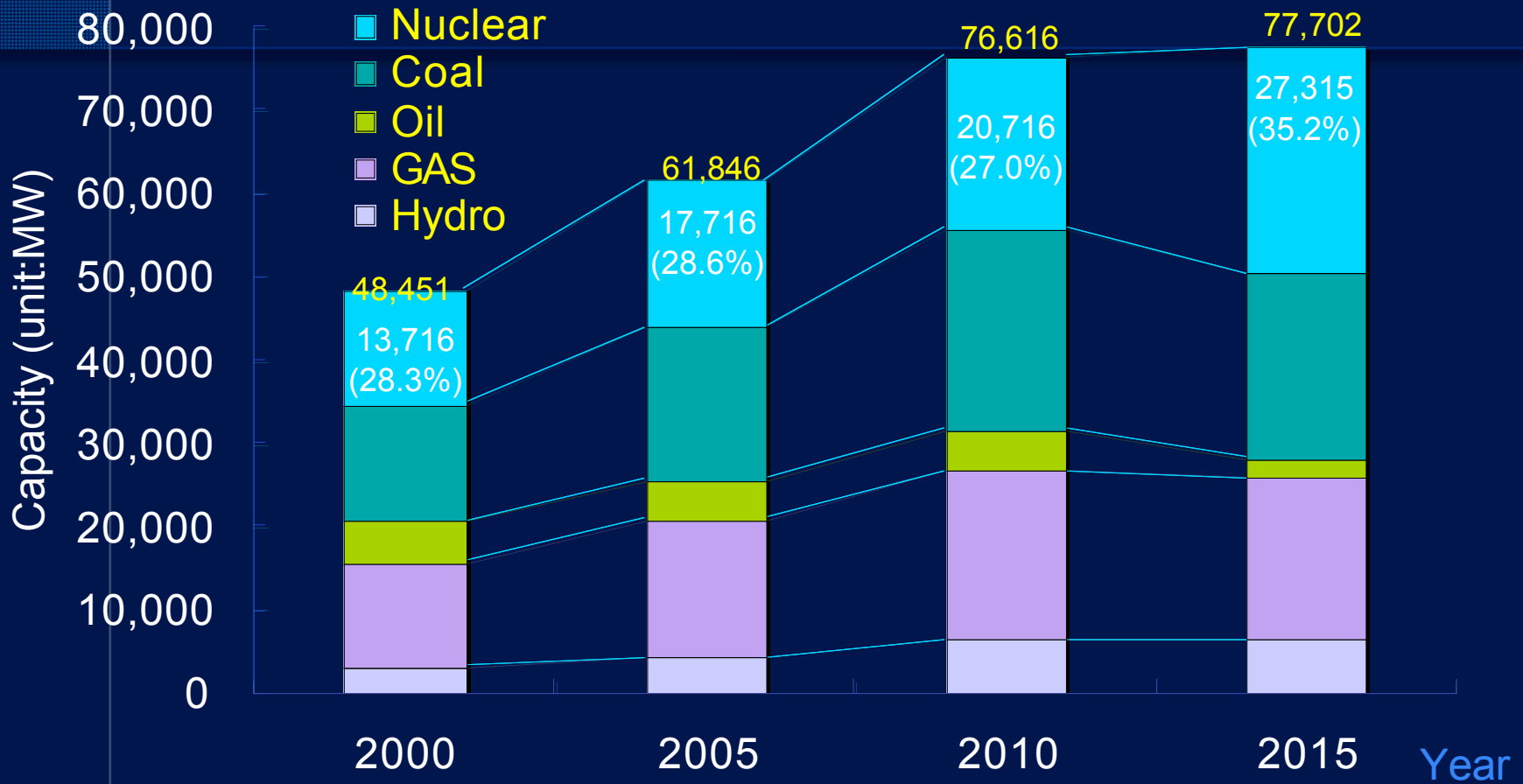
## APR 1400



- Advanced Power Reactor 1400
  - 1400 MWe Evolutionary PWR with safer and more competitive features
  - Developed since 1992 with the state-of-the-art technology
  - Standard design ready and the construction project in progress targeting the commercial operation at the Shin-Kori site in 2011

- New projects to build PWR types of Evolutionary ALWR are co-currently carried out in Asia and Europe.
  - APR1400 in Korea : Shin-Kori 3&4 by KHNP
  - APWR in Japan : Tsuruga 3 & 4 by JAPC
  - EPR in Finland : Olkiluoto 3 by TVO
- Since these are the first project for the first kind of nuclear power plants, sharing Information and experience will benefit the projects.

# Power Development Forecast by 2015



- Two more APR1400s are in plan and licensing renewal for old units are considered.

### 3. Near Term Issues and Prospects of Nuclear Power in Korea

- Nuclear Power has grown steadily during the past 25 years.
  - Supplying high-quality and reliable power at affordable prices
  - Securing stability and diversity in energy supply.
- However, the business environment on nuclear power are getting more difficult.
  - As economic development progresses, the public becomes more sensitive on the safety and environment issues.
  - Not-IN-My-Back-Yard syndrome prevails.

## Establishing the Radwaste Repository

- The construction of a radwaste repository is a pressing issue of the nuclear power industry in Korea.
  - Last year, a candidate site was selected, but the final designation was halted.
  - The process for selection was resumed and targets the final decision by the end of year.
  - The local public's opinion is the top priority in the selection process.
- The international support to our effort for the repository establishment was very valuable and most appreciated, and we hope it will continue.

## Dealing with the Power Market Deregulation

- Deregulation of electric power market is undergoing



- Competition demands nuclear power to maintain higher reliability without safety concern.
  - Excellence in operation without fault are the only key to satisfy both safety and economics.
  - Power up-rating and extending operation licenses are of the top priority to reinforce the competitiveness.
  - APR1400 is expected to fortify the competitiveness of nuclear power

## Near Term Prospects of Nuclear Power in Korea

- Maintaining nuclear power in the energy portfolio has been an underlying consideration in Korea.
- Though there could be some variation in the near term, nuclear power in Korea is expected to take an important role in the future as well.
- However, challenges for nuclear industry to overcome are growing as well.

## 4. Pre-requisites and Technology Needs for the Advancement of Nuclear Power

### Improving Public Acceptance

- The public acceptance cannot be overemphasized.
- Cooperation with local community is a key for nuclear power.
- Communication with anti-nuclear groups gets more difficult.
- Delivering correct information and building trust with the public are the impending task of all nuclear community.



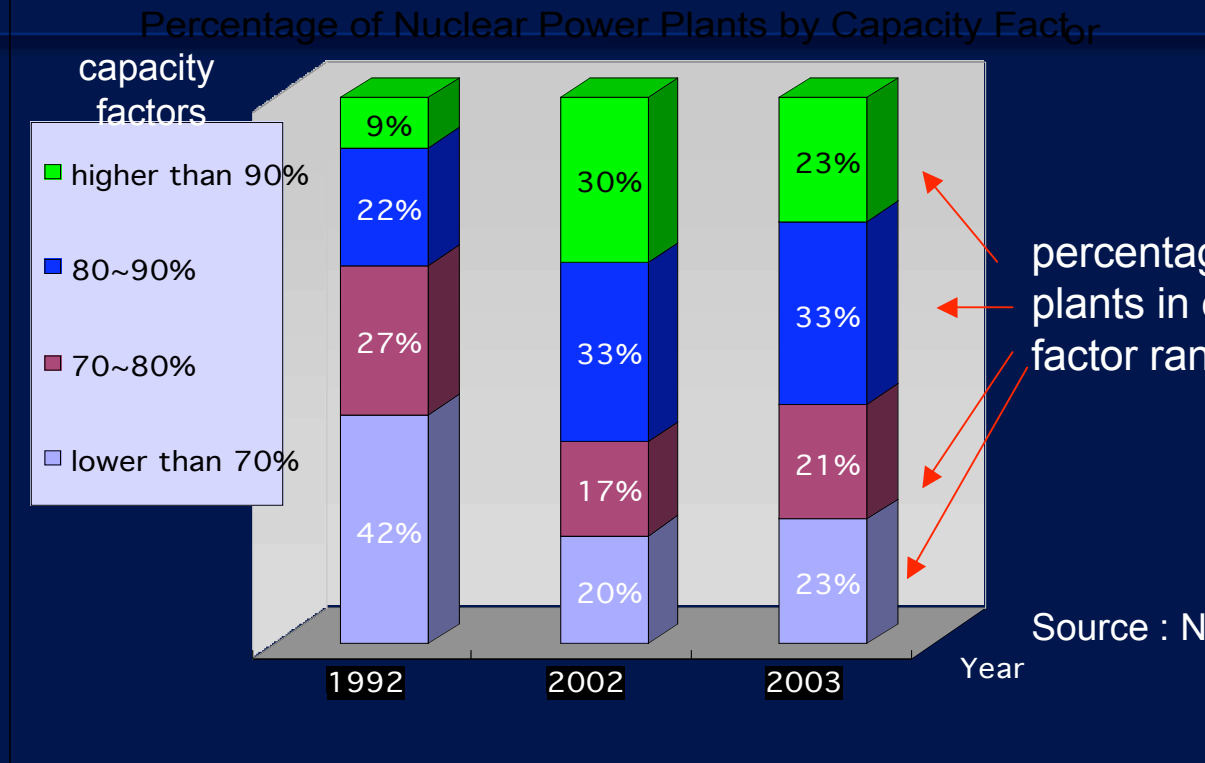
## Attracting Excellent Manpower

- People are the key in any industry and organization.
  - Excellence of personnel is essential to assure the competitiveness of nuclear power.
  - Safety and performance also depend on the qualification of individuals.
- Overcoming the declining image of nuclear power and attracting the young generation is a pre-requisite for the advancement of nuclear power.

## Technology Needs for the Future of Nuclear Power

- Breakthroughs in technology are necessary.
  - To clear up the lingering controversies of safety and high level radwaste.
  - To expand the peaceful use of nuclear power for new energy systems.
- Development of new generation reactors is essential for the success of the nuclear power industry.
  - Korea is also actively participating in the international R&D programs.

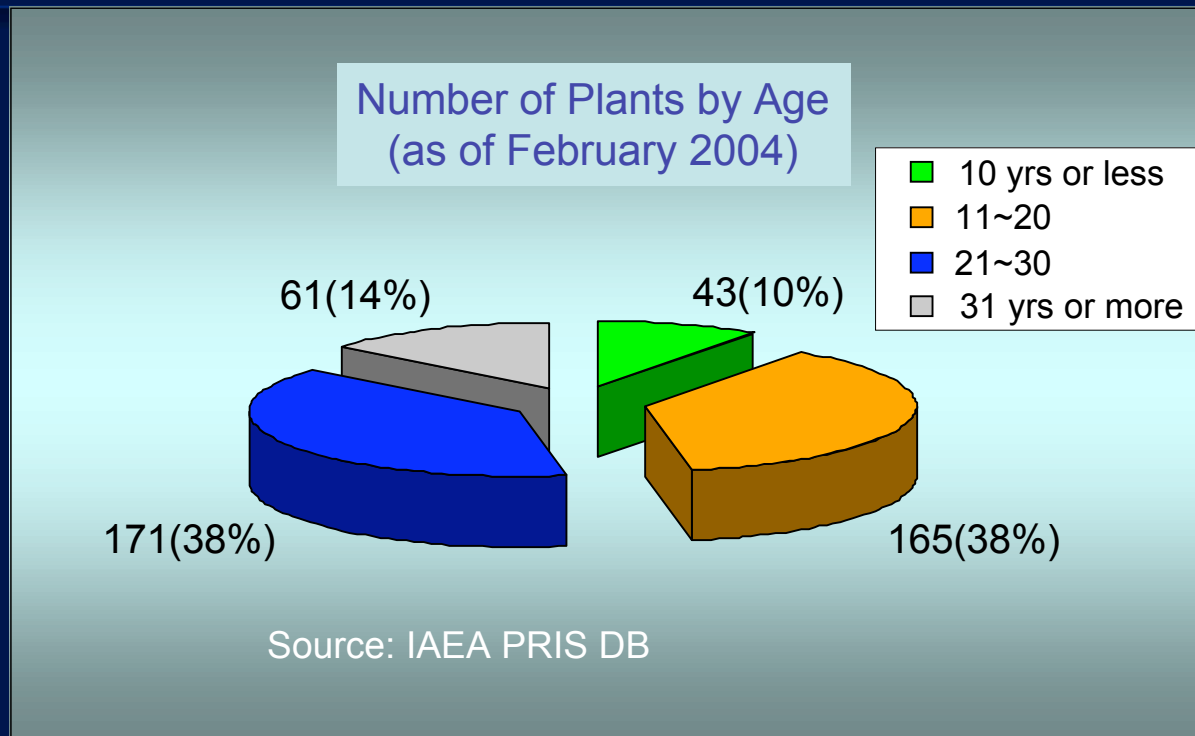
# Technology Needs for the Present Excellence of Nuclear Power



## Performance of nuclear power in details

- The overall planned outage time of nuclear power plants would be increased in coming years due to the increased inspection and refurbishment.

- The world nuclear power plants are 23 years old in average



- From the plant operators' view, coping with ageing is a prior concern to preserve outstanding performance in the near term.
  - Advanced inspection and evaluation technologies need to be developed.

## 5. Concluding Remarks

- Energy is one of central agenda in the new century.
- Nuclear power is inevitable at least in the near term.
- This is the moment of a turning point where opportunities and challenges co-exist for the future of nuclear power.
  - The world nuclear community should double the public outreach efforts.
  - New technology breakthroughs are ever more necessary.

Thank you all !

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