

2010 AEC-NRC Bilateral Technical Meeting

Overview of 2009 NPP Operation Performance in Taiwan

**Nuclear Generation Department
Taiwan Power Company**

May 3 , 2010



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Nuclear Power Plants in Taiwan

GE BWR-4 636 MWe x 2
Commercial Operation Date :
1 Dec. 1978
2 July 1979



Chinshan

Kuosheng



GE BWR-6 985 MWe x 2
Commercial Operation Date :
1 Dec. 1981
#2 Mar. 1983

Lungmen



GE ABWR 1350 MWe x2
(Under Construction)

**In 2009
Nuclear Installed Capacity
5,144 MWe**

Maanshan

Westinghouse PWR 951 MWe x 2
Commercial Operation Date :
1 July 1984
#2 May 1985

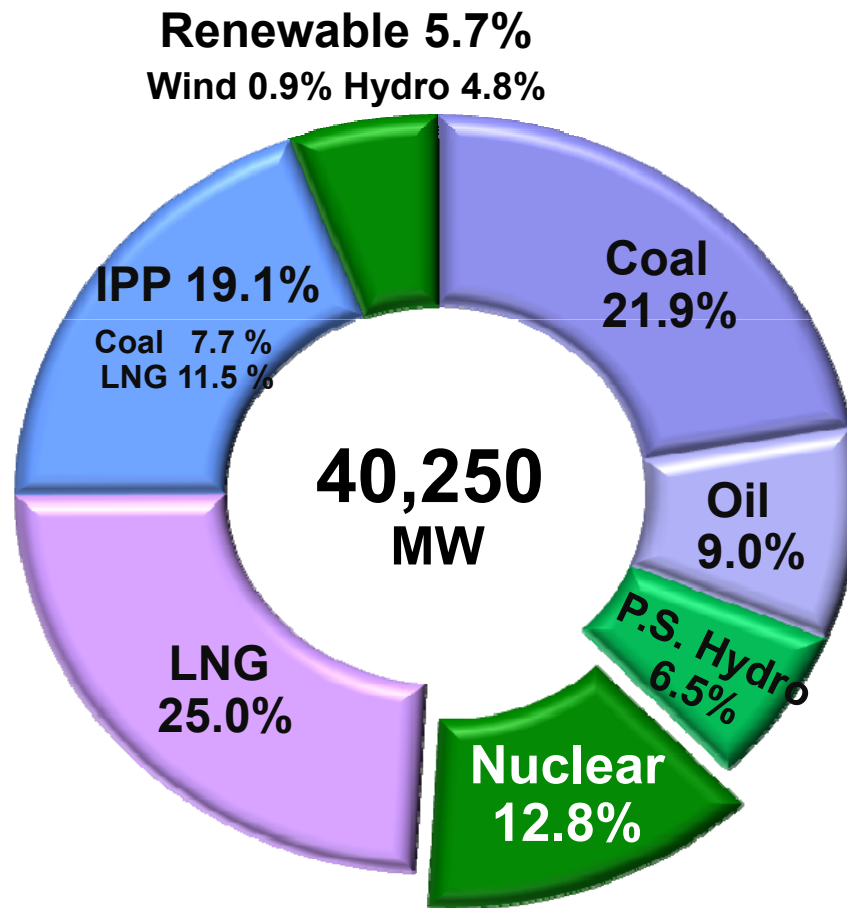


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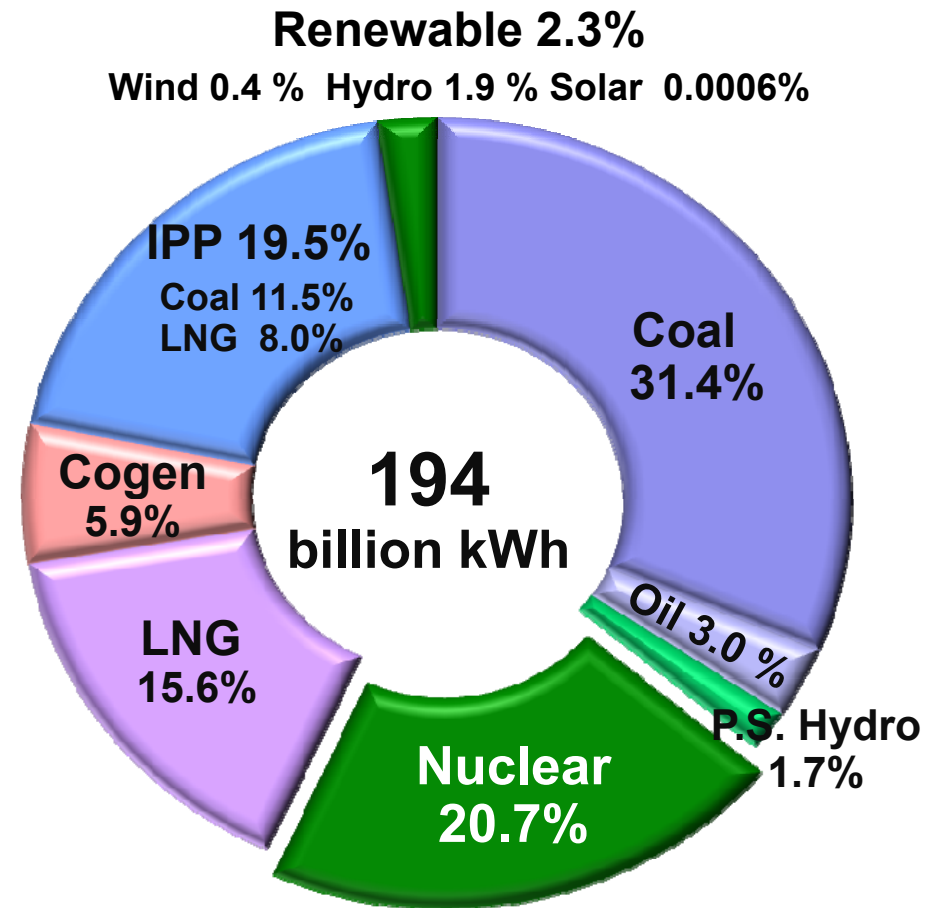


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Taiwan Power System



**Installed Capacity
In 2009**



**Electricity Generation
In 2009**



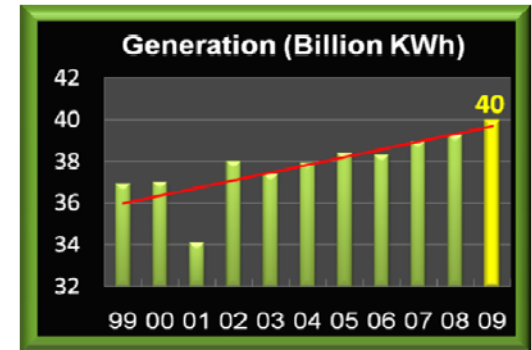
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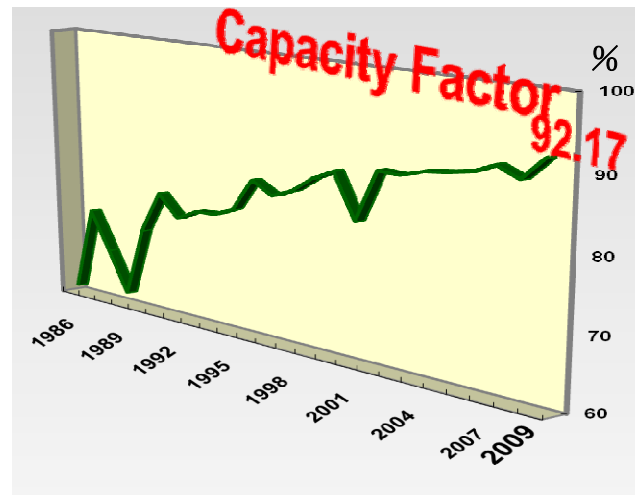
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Nuclear Performance in 2009

➤ Net Electricity Generation :
39.98 billion kWh (record high)



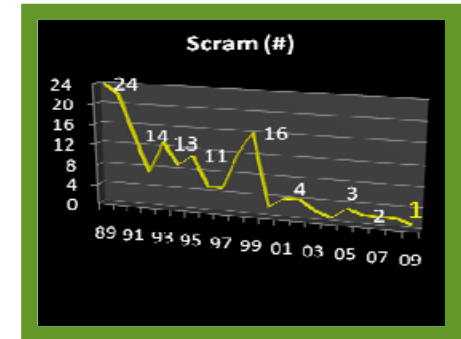
➤ Capacity Factor : 92.17% (record high)



Nuclear Performance in 2009

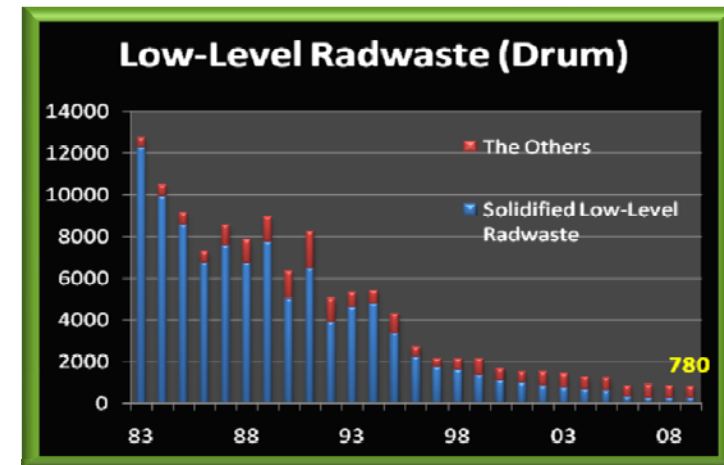
➤ Automatic Reactor Scram

- ✓ 0.17/unit
- ✓ record low
- ✓ one scram in total for all six units

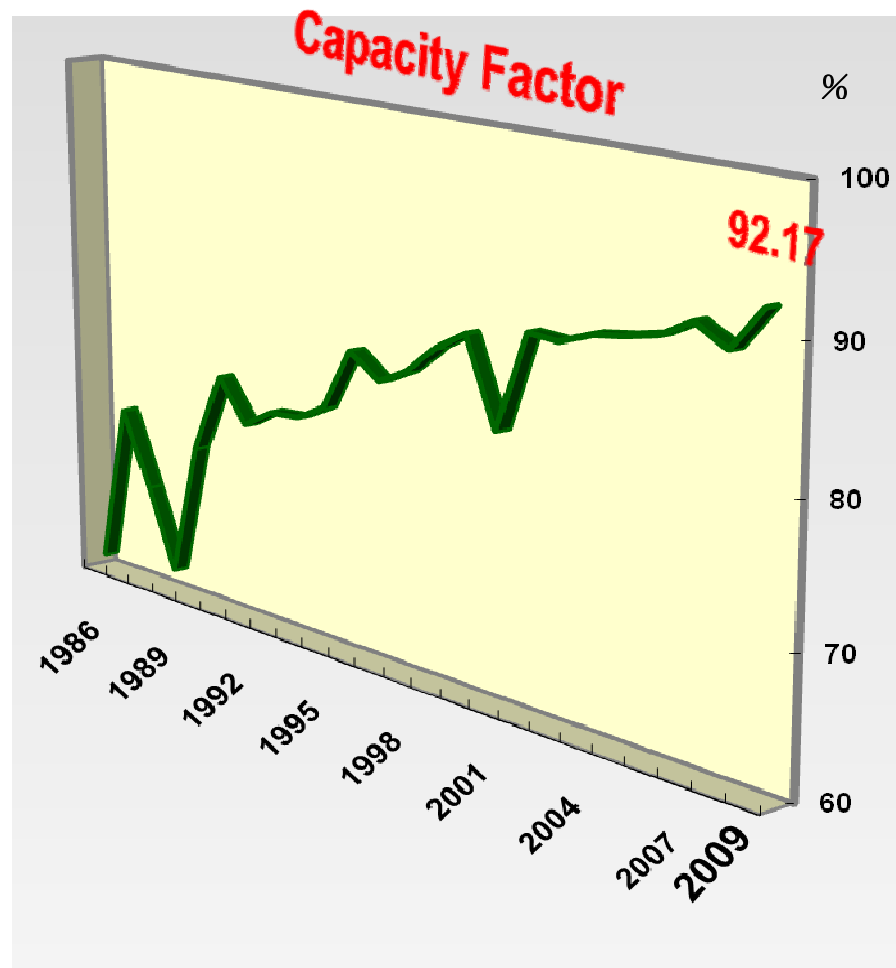


➤ Low-Level Radwaste

- ✓ 780 equivalent drums
- ✓ record low



Key Contributors to Capacity Factor Improvement



- Improved Equipment Reliability
- Shortened Refueling Outages
- Power Uprate
- Equipment Renovation



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Key Contributors to Capacity Factor Improvement

- **Improve Equipment Reliability :**
 - **Maintenance Effectiveness Improvement Program**
 - ✓ Enhancement of Predictive Maintenance Program
 - ✓ Skill certification Requirements for Contractors
 - ✓ Periodic Maintenance
- **Breaker-to-Breaker Run :**
 - Maanshan unit 1 : 512, 11/27/2007 ~ 4/23/2009
 - Maanshan unit 2 : 542, 5/19/2008 ~ 11/12/2009
(Company's Longest Continuous Operation Record)



Key Contributors to Capacity Factor Improvement

- **Shorten Outage Duration :**
 - Pre-Outage Planning and Preparation
 - On-Line Maintenance
 - Equipment / tool upgrade
 - ✓ 360° work platform on cavity
 - ✓ Refueling bridge upgrade to increase fuel shuffle speed
- **Maanshan unit 2 EOC-18 Outage :**
28 days 11 hours and 32 minutes (Company's Best Record)



Key Contributors to Capacity Factor Improvement

- **Power Uprate :**

Measurement Uncertainty Recapture : 55.64 MWe

- **Chinshan unit 1,2 (09/08, Total 11.3 MWe)**
- **Kuosheng unit 1,2 (07/07, Total 20 MWe)**
- **Maanshan unit 1,2 (09/08 , Total 24.3 MWe)**

- **Equipment Renovation**

- **Kuosheng Unit 1 : (07, 34 MWe)**
- **low pressure turbine rotor replacement**



Prospects

SPU : Stretch Power Uprate

Chinshan NPP

- ▶ 2012
- ▶ 24 MWe

SPU

Kuosheng NPP

- ▶ 2014
- ▶ 36 MWe

Maanshan NPP

- ▶ 2016
- ▶ 36 MWe

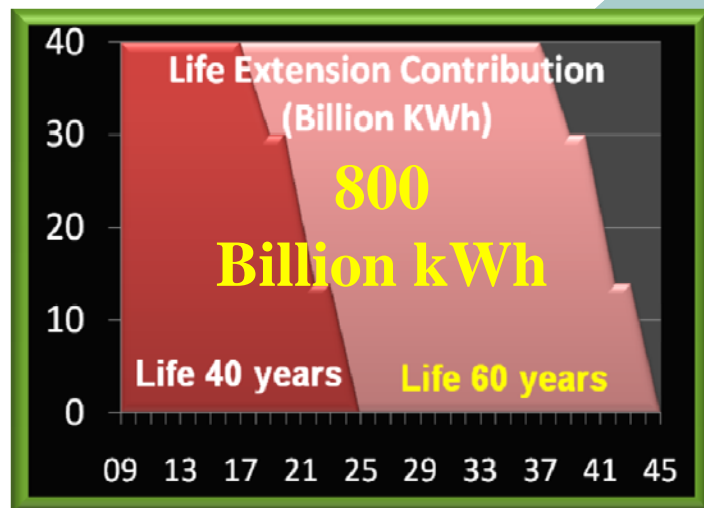


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Prospects



License Renewal

Chinshan NPP

▶ 2018 → 2038

▶ 2019 → 2039

Maanshan NPP

▶ 2024 → 2044

▶ 2025 → 2045

Kuosheng NPP

▶ 2021 → 2041


▶ 2023 → 2043



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Thanks for Your Attention
Welcome to Taiwan