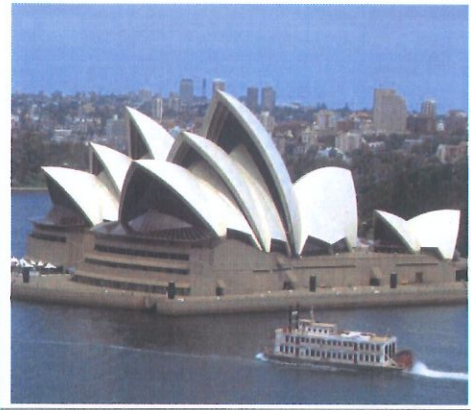


# Taipower's Uranium Demand and Procurement



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## Outline

1. Nuclear Power Projects
2. Uranium Demand and Procurement
3. Enhancing Australian Uranium Supply
4. Conclusion



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# Taipower's Nuclear Power Station



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## Overview of Taipower's Nuclear Power Station

Plant Name	Reactor Type	Installed Capacity (MWe)	Commercial Operation	Core Assembly and Weight
Chinshan	BWR-4	636x2	1978 & 1979	408 bundles (72tU)
Kuosheng	BWR-6	985x2	1981 & 1983	624 bundles (111tU)
Maanshan	PWR	951x2	1984 & 1985	157 bundles (66tU)
Lungmen	ABWR	1,350x2	scheduled for 2014 & 2016	872 bundles (159tU)

Total Installed Capacity: 7,844 MWe + 55.64 MWe (MUR) =>7,900 MWe



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## Outlook of Taipower's Nuclear Power Under New Energy Policy

- Lungmen power station will be brought into operation after completion of safety review.
- Six currently operating units will be operating till the end of the 40-year design lives, which are:
  - Chinshan: 2018 and 2019
  - Kuosheng: 2021 and 2023
  - Maanshan: 2024 and 2025
- No more new build of nuclear power units.



## Taipower's Uranium Demand

Year	Annual Requirement (million lbs U3O8)
2011	2.60
2012	2.85
2013	3.14
2014	3.37
2015	3.25
2016	2.96
2017	2.60
2018	2.39
2019	2.16
2020	1.68

Assuming units at Chinshan, Kuosheng and Maanshan plants will be shutdown after 40-year operation and two units at Lungmen plant will be brought online in 2014 and 2016, respectively.



# Taipower's Uranium Procurement Strategy

- Taipower adopts 3 basic policies for securing uranium supply
  - Diversification (supply limit):
    - Supplying group or region in long term contract (LTC) : 60% of annual procurement from LTC
  - Inventory Policy:
    - 3 years (U3O8 + UF6)
  - Relying on Term contracts :
    - LTC (>3years) :  $\geq 50\%$  of total annual demand
    - mid term contract (MTC) and spot purchase: the balance
- All procurements are conducted through international tenders per the requirements of R.O.C. Government Procurement Act.



## Current Status of Australian Suppliers' Sales to Taiwan

Contract Year	BHP Billiton Olympic Dam Corporation (1,000 Lb U3O8)	Energy Resources of Australia Ltd (1,000 Lb U3O8)	Paladin Energy Ltd (1,000 Lb U3O8)	Australian Supply vs Taipower Annual Demand
2006	190			7%
2007	210	525		28%
2008	210+250	525		42%
2009	210	525	500	52%
2010	210	525	200+500	56%
2011		525	500+330	44%
2012			500+300	22%
2013			500+300	22%
2014			500+300	24%
2015			500+300	24%
2016			500	15%
2017			500	15%
2018			500	15%
2019			500	15%
2020			500	15%



## Sources of Taipower's Uranium

Unit : 1,000 lbs U3O8

Year Country	2006		2007		2008		2009		2010	
	Australia	190	5.6%	735	26.8%	985	24.1%	880	25.5%	940
Kazakhstan	142	4.2%	58	2.1%	716	17.5%	-	-	200	5.2%
Canada	1,381	41.0%	525	19.1%	525	12.9%	405	11.8%	605	15.7%
U.S.A.	193	5.7%	588	21.4%	400	9.8%	-	-	-	-
South Africa	437	13.0%	-	-	50	1.2%	-	-	-	-
Namibia	475	14.1%	579	21.1%	755	18.5%	1,360	39.5%	1,330	34.6%
Russia	-	-	-	-	650	15.9%	200	5.8%	-	-
Uzbekistan	148	4.4%	260	9.5%	-	-	300	8.7%	500	13.0%
Others	400	11.9%	-	-	4	0.1%	300	8.7%	270	7.0%
Total	3,366	100.0%	2,745	100.0%	4,085	100.0%	3,445	100.0%	3,845	100.0%



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## Prospect of Australian Uranium Supply

- **Important role in the nuclear industry: the largest uranium resources in the world (23%, RAR) and the third uranium production country (11%, 2010).**
- **High political and economic stability**
- **Aggressive uranium expansion programs:**
  - BHP-B's Olympic Dam mine after full expansion will quadruple annual uranium production to 42 million lbs over 11 years;
  - BHP-B remains committed to developing the Yeelirrie deposit and is continuing to progress the project with a focus on developments in technologies to improve the project's environmental and economic outcomes.
  - Development of Ranger 3 Deeps deposit (75 million lbs) could extend ERA's production until at least 2020;
  - New mines (eg Four Mile and Honeymoon) may begin production in the near term.
  - Expansion of its overseas uranium products (e.g. Paladin's Langer Heinrich & Kayelekera mines in Africa) being a paradigm to new mining companies.



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## Conclusion

- Taiwan is one of the few countries thoroughly review their nuclear energy policy in response to the Fukushima accident. Although the nuclear generation is expected to decline, it will still be maintained in certain portion of the total generation mix.
- Taipower will need certain amount of uranium to keep the operation of the nuclear reactors in the future. Therefore, the Australian suppliers are welcome to continue participating in Taipower's uranium procurement tenders.

