Uranium Supply Strategy of China

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1. Nuclear Power Status

- 20 Nuclear power reactors are in operation. The total capacity is 17.94GW. 28 of nuclear power reactors are under construction. The total capacity of Nuclear power will reach 40GW by the end of 2015. The target of nuclear power of China is to have 58GW in operation and 30GW under construction by the end of 2020.

- In October 2012, the State Council approved the nuclear safety planning in which strengthened safety of nuclear power. The administrator of National Energy Administration said early this year that some NPP units will be approved in suitable time this year. Construction of coastal nuclear power projects will be steadily proceeded. In land NPP sites will be well protected.
- Premier Li Keqiang said in his annual government report(2014.3) that a number of NPPs will be approved and started to be constructed this year.

Nuclear Power Plants in Operation

Index	Name of Nuclear Power Plant		Reactor	Capacity MWe	Construction	Operation
1	Qingshan I		PWR	310	1985-3-21	1991-4-1
2	Daya Bay	No. 1	PWR	984	1987-8-7	1994-2-1
		No. 2	PWR	984	1988-4-7	1994-5-6
3	Qingshan II	No. 1	PWR	650	1996-6-2	2002-4-15
			PWR	650	2006-4-28	2010-10-5
		No. 2	PWR	650	1997-4-1	2004-5-3
			PWR	650	2007-1-29	2011-11-25
4	Ling'ao I	No. 1	PWR	990	1997-5-15	2002-5-28
		No. 2	PWR	990	1997-11-28	2003-1-8
	Ling'ao II	No. 3	PWR	1080	2006-6-15	2010-8-7
		No. 4	PWR	1080	2006-6-15	2011
5	Qingshan III	No. 1	HWR	700	1998-6-8	2002-12-31
		No. 2	HWR	700	1998-9-25	2003-7-24
6	Tianwan	No. 1	PWR	1060	1999-10-20	2007-5-17
		No. 2	PWR	1060	2000-9-20	2007-8-16
7	Hongyanhe	No.1	PWR	1080	2007-8-18	2013-2-17
		No.2	PWR	1080	2008-3-28	2013-11-23
8	Ningde	No.1	PWR	1080	2008-2-18	2013-4-18
		No. 2	CPR PWR	1080	2008-11-3	2014-5-4
9	Yangjiang	No. 1	CPR PWR	1080	2008-12-16	2014-3-26
Total Installed Capacity of 20 Units, MWe				17938		

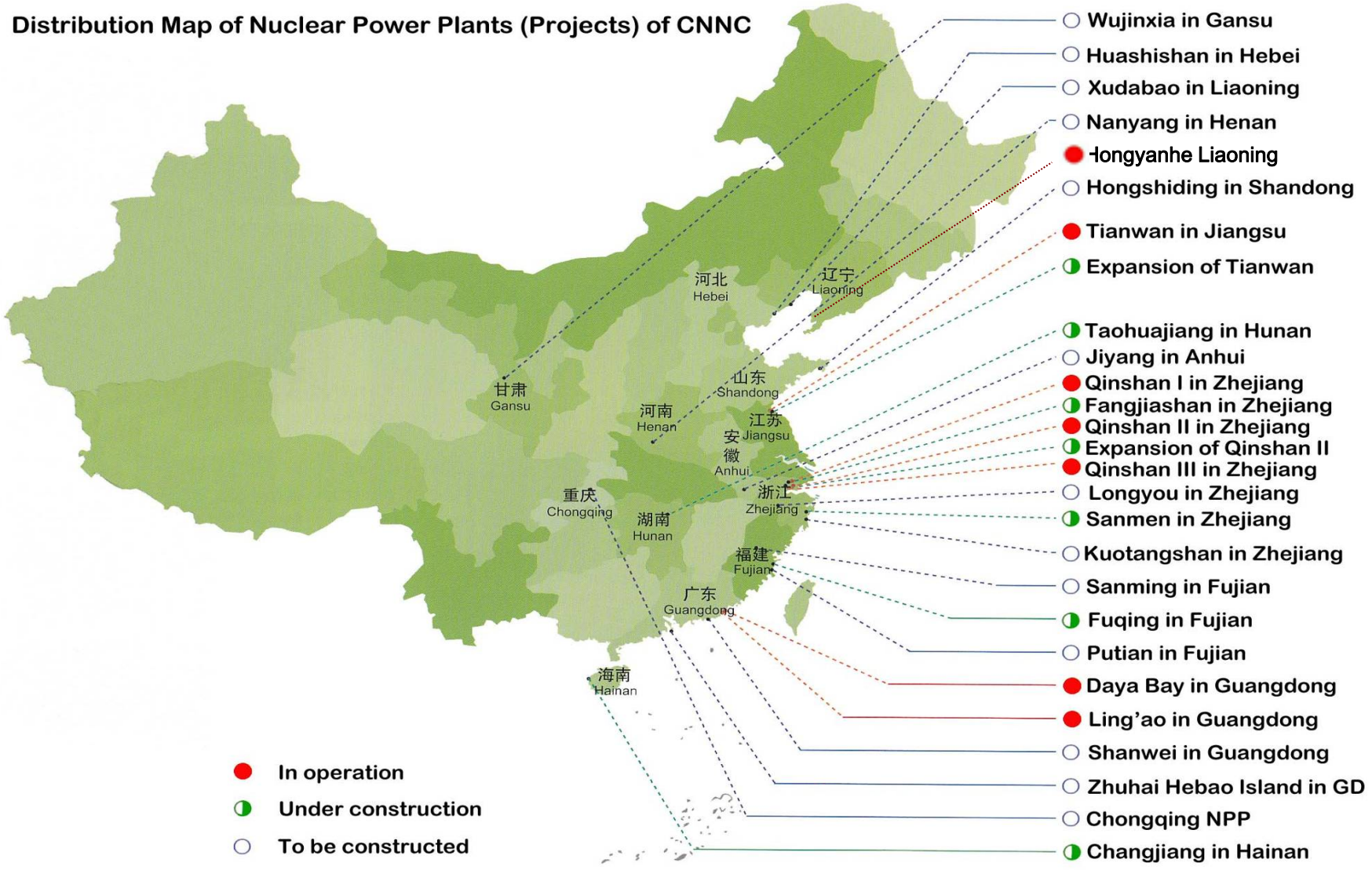
NPPs under Construction

Index	Province	Name of Nuclear Power Plant		Reactor	Construction	Capacity, MWe
1	Fujian	Fuqing	No. 1	PWR II	2008-11-21	1080
2	Zhejiang	Fangjiashan	No. 1	PWR II	2008-12-26	1080
3	Liaoning	Hongyianhe	No. 3	CPR PWR	2009-3-7	1080
4	Zhejiang	Sanmen	No. 1	AP1000 PWR	2009-4-19	1250
5	Guangdong	Yangjiang	No. 2	CPR PWR	2009-6-5	1080
6	Fujian	Fuqing	No. 2	PWR II	2009-6-17	1080
7	Zhejiang	Fangjiashan	No. 2	PWR II	2009-7-17	1080
8	Liaoning	Hongyianhe	No. 4	CPR PWR	2009-8-15	1080
9	Zhejiang	Sanmen	No. 2	AP1000 PWR	2009-12-15	1250
10	Guangdong	Taishan	No. 1	EPR PWR	2009-12-21	1700
11	Shandong	Haiyang	No. 1	AP1000 PWR	2009-12-28	1250
12	Fujian	Ningde	No. 3	CPR PWR	2010-1-8	1080
13	Guangdong	Taishan	No. 2	EPR PWR	2010-4-15	1700
14	Hainan	Changjiang	No. 1	PWR II	2010-4-25	650

NPPs under Construction

Index	Province	Name of Nuclear Power Plant		Reactor	Construction	Capacity, MWe
15	Shandong	Haiyang	No. 2	AP1000 PWR	2010-6-20	1250
16	Guangxi	Fangchenggang	No. 1	CPR PWR	2010-7-30	1080
17	Fujian	Ningde	No. 4	CPR PWR	2010-9-29	1080
18	Guangdong	Yangjiang	No. 3	CPR PWR	2010-11-15	1080
19	Hainan	Changjiang	No. 2	PWR II	2010-11-21	650
20	Guangxi	Fangchenggang	No. 2	CPR PWR	2010-12-28	1080
21	Fujian	Fuqing	No. 3	PWR II	2010-12-31	1080
22	Fujian	Fuqing	No.4	PWR II	2012-10	1080
23	Guangdong	Yangjiang	No.4	CPR PWR	2012-11-17	1080
24	Shandong	Rongcheng	No.1	HTGR	2012-12-21	200
25	Jiangsu	Tianwan	No.3	PWR	2012-12-27	1120
26	Jlangsu	Tianwan	No.4	PWR	2013-9-27	1120
27	Guangdong	Yangjiang	No.5	CPR PWR	2013-9-18	1080
28	Guangdong	Yangjiang	No.6	CPR PWR	2013-12-23	1080
Total Units		28		Total Installed Capacity, MWe		30500

Distribution Map of Nuclear Power Plants (Projects) of CNNC



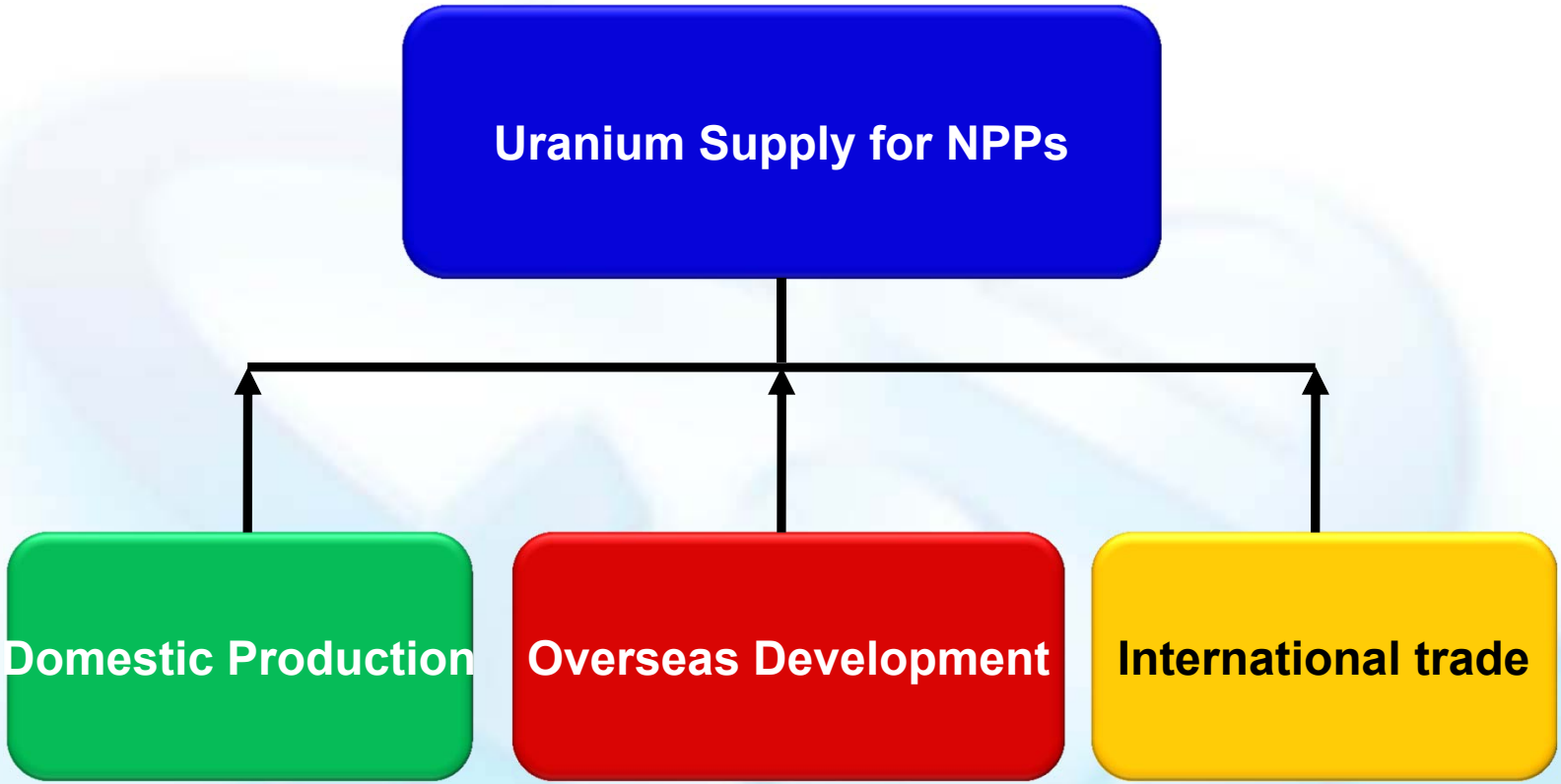
2.Uranium Demand & Supply

Uranium Demand of China & CNNC

		2015	2020	2025	2030
Nuclear Power Development Plan (GW)	China	40	58	100	130
	CNNC	18	26	45	59
Uranium Demand（t U）	China	7400	11000	18500	24000
	CNNC	3300	4800	8300	11000

Uranium Supply Strategy

- Based on the requirement from NPPs, uranium will be supplied through the following three channels.



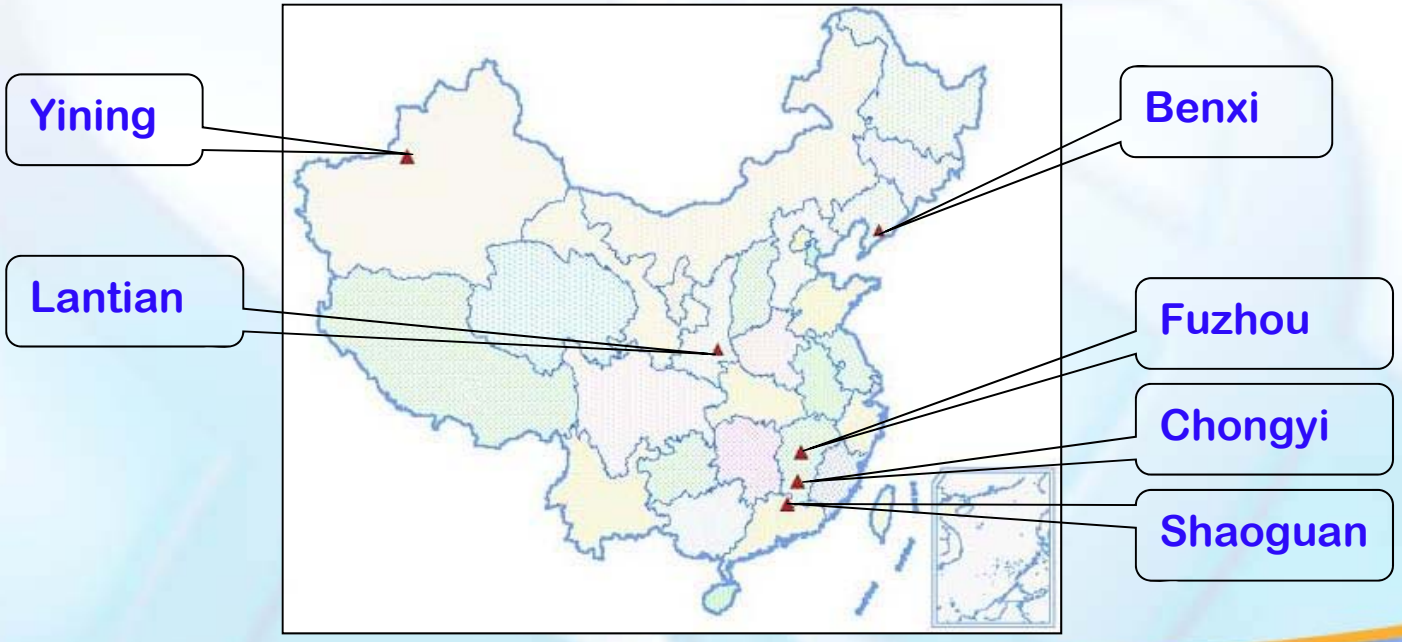
Uranium Exploration & Development Capability

Uranium Exploration & Development in China

- Department of Geology & Mining, CNNC, founded in 2011; focus on uranium exploration & production; as the sole platform of Uranium exploration, mining and metallurgy in China
- With about 40 subsidiaries, including exploration teams, uranium mines, purification factory, research institutes and engineering design company; over 16,000 staff
- For exploration, starting in the early 1950's; Discovered hundreds of uranium deposits, with identified uranium resources over 0.3 million tU, and 2 million tU potential
- Exploration & Drilling capability over 1 million meters per year

Domestic U Production

- The domestic uranium mining of the whole country is carried out by CNNC through its subsidiary, China Nuclear Uranium Corporation.
- Six production centres, Fuzhou and Chongyi in Jiangxi of East China, Lantian in Shaanxi of Central China, Benxi in Liaoning of Northeast China, Shaoguan in Guangdong of South China and Yining in Xinjiang of Northwest China.



Location of the uranium production centres

Domestic production

- With the intensive exploration in Northern China focused on sandstone type of uranium deposit, some significant deposits are discovered in recent years, like Daying. Exploration around existing mines are also made progress.
- Prefeasibility and feasibility study to develop these deposits are also doing accordingly.
- With increased resources, expansion of old production centers are also possible, like Fuzhou mine, Benxi mine.

Domestic production

- After Fukushima accident, uranium price keeps going down and remain in a lower level. Domestic development focused on sandstone type of deposits in Xinjiang and Inner Mongolian regions. As a number of such deposits are discovered in these regions. It made the low cost production possible.
- For the existing mine, to increase the production capacity and prolong the mine life is likely with the newly discovered resources near the existing orebody.

The nominal capacity of the existed production centers are 1800tU/a, and with potential expansion to 2900tU/a.

Overseas development

Since early 2004,CNNC has been looking for uranium development opportunities outside of china, then CGNPC also started to look for uranium assets from 2006.

- CNNC acquired Azelik project in 2006 and started construction in 2008 and first barrel of product was produced in 2010. Production reached 300tU/a, capacity is 700tU.
- CGNPC acquired Irkol and Semizbay projects in 2008, the two projects combined into Semizbay-U LLP. The total capacity of Semzibay-U is 1450tU/a.
- CGNPC acquired 100% Husab project from Kalahari Minerals and Extract Resources in 2012 , the construction of the mine started in Oct,2012. It expected to start operation by the end of 2015, and reached the designed capacity of 5700tU/a by the end of 2017.

Overseas development

- In 2008 and 2009, CNNC acquired Namibia, Mongolian project.
- In 2009, CGNPC acquired majority shares of Energy Metals limited.

  All these projects are under different stages of exploration and development.
- In Jan 2014, CNNC acquired 25% of LH project from Paladin(not yet completed), annual contributed production is 500tU.

- With the low uranium price, it slow down the development of the existed uranium projects, like Mongolian project and Namibia project of CNNC, also Australian project of CGNPC. It also affects the present production centers both domestic and overseas.

- We are still looking for more projects are fit to the future need of NPPs in China

Uranium Trade

- CNEIC, fully subsidiary of CNNC, has been doing uranium trade on behalf of CNNC for many years and signed some contracts with uranium production entities.
- CGNPC uranium corp, a newly uranium trader, doing uranium trade on behalf of CGNPC.

The uranium trade are well supplemented to the domestic and overseas production to meet the requirement of NPPs.

3. Conclusion

- With the rapid development of Nuclear power in the next few years, uranium demand will increase accordingly.
- Overseas uranium development will be the major channel to meet the future requirement of NPP demand in China.

Thanks for your attention!