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ФГ₩GØCGN

# Natural Energy Powering Nature

Address: Science Building, No. 1001 Shangbuzhong Road, Futian District, Shenzhen Postal code: 518028 Tel: 86-755-8367 1005 Fax: 86-755-8369 9900





# 2014







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# 2014

# CGN Guardian of Secure Energy

- <sup>01</sup> Clean Environment, Our Gift to the Children
- Safety,
  Our Commitment
  to Society and Public
- Innovation,
  Driving our Development
  Now and into the Future

The Story of CGN is Never-ending with Growth and Success

CGN Facilitating Development of Clean Energy Technologies

- <sup>13</sup> Planning Clean Energy with Forward-looking Mindset
- Developing Clean Energy with
  Strong Sense of Responsibility
- <sup>19</sup> Every Power Plant is a Family











Non-nuclear clean energy Above 20 billion kWh for the first time 27%

An enormous gap compared

with the global

average

of 2013







Safety, **Our** Commitment to Society and Public

 $\sqrt{}$ 

20 years of safe operation and energy supply powering rapid development of Shenzhen

1994.2.1

Unit 1 of Daya Bay NPP was put into commercial operation

Over 20 years, six units of GNPS, Ling Ao Nuclear Power Station (LNPS) Phase I and Phase II were put into operation in succession. Daya Bay Nuclear Power Base has succeeded in supporting the economic development and enabling a pleasant living environment for Guangdong and Hong Kong.

1994

2014

By April, 2014

Unit 1 of GNPS had operated safely for 4142 consecutive days, ranking the first among the 64 units of similar design in the world.

# base management.

# 8 units have maintained a record of safety and stability without unplanned reactor shutdowns\*.

\*Note: Unplanned reactor shutdown refers to the reactor shutdown (including manual and automatic) resulting from equipment failure or human error. The frequency of unplanned shutdown reflects the operational status of nuclear power units, the equipment maintenance conditions and the level of nuclear safety management. In 2013, there were 36 automatic and 34 manual shutdowns in the 104 units in the United States, and 34 automatic shutdowns in the 58 units of EDF.

## Six Units in Daya Bay Nuclear Power Base



Note: WANO indicators mean the key indicators compiled by WANO to assess NPP safety operation.

Since 1999, CGN has been participating in the annual safety performance challenge among units of the same type organized by EDF to contest with over 60 units of the same type from France, China, Germany, South Africa, etc, winning a total of 31 first awards.

## Ningde NPP Unit 1



# CGN had put two more units into operation in 2013, stepping into a new stage of multiple nuclear power



## Hongyanhe NPP Unit 1









## ACC1000: China's GEN-III nuclear power technology

# Advanced technology based on mature application Enhanced safety and Based on 30 years of experience and expertise better economy in nuclear power development in China Priority on safety measures in design With reference to other GEN-III technologies in the world In line with the ultimate target of "eliminating the possibility of large radioactive release in design" Full consideration to the global post-Fukushima feedback and implementation of the nuclear safety regulatory requirements Able to withstand the extreme conditions similar to those of Fukushima accident Integration of proven technologies of the nuclear power supply chain in China **Combination of active** and passive systems Combining the maturity of active safety systems as well as the advantages of passive safety systems One of the most competitive GEN-III nuclear power technologies worldwide



Natural Energy Powering Nature





- Double containment capable of withstanding the impact of a large commercial airplane

# Small Modular Reactor An Integrated High-security and Distributed Energy System

Small Modular reactor refers to an integrated, modular and multi-purpose small reactor independently developed by CGN, which provides clean energy for the society in a safe and efficient way, and is an ideal solution to small-scale grid, combined energy supply of water and steam in thermal power plants, and offshore distributed energy supply.



# STEP- Stride Toward Excellent Performance Developing Nuclear Fuel Assembly of an Indigenous Proprietary Brand





system will come into use by a 1000 MWe has built a NPP "nerve center" and China's first one to own proprietary nuclear-class DCS

# R&D Platform









Up to 2013

granted

CGN had applied for

1226 patents

595 had been

among which

By the end of 2013, CGN had undertaken 60 national projects including the key national nuclear power programs, the engineering demonstration projects and the strategic new industry projects entrusted by the National Energy Administration of China, the 973 Program projects, 863 Program projects and national key technology R&D projects entrusted by the Ministry of Science and Technology of China, and the key technological innovation and industrialization projects entrusted by the Ministry of Finance of China, among which 10 projects are newly added with a fund of 200 million Yuan allocated by the state appropriation.

# Patent Indicators

In 2013, CGN was honored with the "National Intellectual Property Pilot Enterprise", the only enterprise in the nuclear power industry; China Nuclear Power Engineering Co., Ltd won the "National Pilot Enterprise in Patent Operation", and its "Digital Rod Control and Monitoring System and its Method of Control" was granted as excellent patent in the fifteenth China Patent Award; Daya Bay Nuclear Power Operations and Management Co., Ltd was awarded "Shenzhen Patent Prize" for its invention of "Method and System for Emergency Power Supply for Nuclear Power Station".

# Investments in Scientific **Research Activities**



# **Research Projects**

# CGN Facilitating Development of Clean Energy Technologies





Installed Capacity in operation (10 MW)













r Mongolia	, and Inne	Northeast China, North China
Nuclear	Liaoning	Unit 1 & 2 of Hongyanhe NPP Phase I
Power		Unit 3 & 4 of Hongyanhe NPP Phase I
		Hongyanhe NPP Phase II
Wind Power	Inner Mongolia	Suyou Wind Farm, Hongji Wind Farm, Dorbet Wind Farm, uide Wind Farm and Xiwu Wind Farm, etc.
	Jilin	Da'an, Dagangzi
	Hebei	Chabei Wind Farm
	Henan	Youyu
	Shandong	Taipingshan, Tangwangshan
	Heilongjiang	Halahai, Anbang River
ntral China	Cei	
Nuclear Power	Hubei	Xianning Nuclear Power Project
Hydropower	Hubei	Baihe Hydropower Station
	Hunan	ower Station, Wuling Hydropower Station
Wind	Hubei	Dawu
Power		
East China	van Strait,	Western Taiv
East China Nuclear	<b>van Strait,</b> Fujian	Western Taiv  Unit 1 & 2 of Ningde NPP Phase I
East China Nuclear Power	<b>van Strait,</b> Fujian	Unit 1 & 2 of Ningde NPP Phase I Unit 3 & 4 of Ningde NPP Phase I
East China Nuclear Power	<b>van Strait,</b> Fujian Shanghai	• Unit 1 & 2 of Ningde NPP Phase I Unit 3 & 4 of Ningde NPP Phase I



Nuclear	Guangdong	GNPS
rowei		LNPS Phase I
		LNPS Phase II
		Yangjiang NPP Unit 1
		Yangjiang NPP Unit 2~6
		Taishan NPP Phase I
		Lufeng NPP
inium mine	Ura	Guangdong mining area
Vind Power	v	Taishan Shangchuan Island, Taishan Xiachuan Island
olar Energy	So	Shenzhen Airport Project
lydropower	ŀ	Hydropower Pumped Storage Projects in Guangzhou and Huizhou

# Nuclear Power "Going Global"

Initiator of CNEIDA (China Nuclear Energy Industry Development Alliance)
 Current rotating presidency of CNEIDA

- Overseas exploited uranium resource bases
- **7** overseas offices
- Main countries for nuclear power development
- Cooperating countries on clean energy

### United States

The Rooftop Photovoltaic Project in New Jersey

#### Romania

CGN has signed the Letter of Intent for Cooperation on the construction of uni 3 & 4 of Cernavoda NPP in Romania

#### South Africa

The strategic joint development program led by CGN has been finalized for South

# South America

North America

Europe

Africa

Asia

Oceania -



#### United Kingdom

CGN has participated in the constructior of UK HinkleyPointC Nuclear Power Project

#### Kazakhstan

CGN has established a joint venture with the National Atomic Company of Kazakhstan – Semizbai-U LLP

#### Uzbekistan

CGN has set up a joint venture on uranium exploitation and prospecting in Uzbekistan, the first foreign enterprise that obtains a sandstone type uranium mine block in Uzbekistan

#### South Korea

CGN owns Yulchon Power Plant in South Jeolla Province, Seosan Power Plant and Korean Fuel Cell Power Plant

#### Singapore

CGN has built an integrated solar-biomass power generation project

#### Australia

Morton's Lane Wind Farm, CGN's first overseas wind power + + + project, has been put into operation

> With the acquisition of EME, a listed uranium resources exploration company, CGN has obtained all qualifications necessary for trading natural uranium resources in Australia

#### Namibia

The world's third-largest uranium mine in Namibia-Husab Project is currently under construction, with an eventual annual output to rank the world second after putting into production in 2017.









Established in September, 1994 with a registered capital of RMB 10.2 billion, China General Nuclear Power Group (CGN), formerly China Guangdong Nuclear Power Group, is a central enterprise growing up in tandem with China's Reform and Opening-up drive, and the country's nuclear power program. CGN, as a colossal state-owned enterprise, comprises its core member, China General Nuclear Power Corporation, and over 30 subsidiaries, with a staff of 29,000.

# with a staff of 29,000 ۲¥۲

# 中广核 G CGN



### **Nuclear Power**

CGN Power Co., Ltd Guangdong Nuclear Power Investment Co., Ltd. Guangdong Nuclear Power Joint Venture Co., Ltd. Ling Ao Nuclear Power Co., Ltd. Lingdong Nuclear Power Co., Ltd. Yangjiang Nuclear Power Co., Ltd. Liaoning Hongyanhe Nuclear Power Co., Ltd. Fujian Ningde Nuclear Power Co., Ltd. Taishan Nuclear Power Joint Venture Co., Ltd. Guangxi Fangchenggang Nuclear Power Co., Ltd. Xianning Nuclear Power Co., Ltd. CGN Lufeng Nuclear Power Co., Ltd. Hubei Nuclear Power Co., Ltd.

#### Non-nuclear Clean Energy

CGN Wind Energy Limited Meiya Power Co., Ltd. CGN Solar Energy Development Co., Ltd. CGN Energy Service Co., Ltd.

## **Nuclear Fuel**

CGN Uranium Resources Co., Ltd.



- Huizhou Nuclear Power Co., Ltd.
- Anhui Wuhu Nuclear Power Co., Ltd.
- Lingwan Nuclear Power Co., Ltd.
- Shaoguan Nuclear Power Co., Ltd.
- Xishui Nuclear Power Co., Ltd.
- China Nuclear Power Operations Co., Ltd.
- Daya Bay Nuclear Power Operations and Management Co., Ltd.
- China Nuclear Power Engineering Co., Ltd.
- China Nuclear Power Design Co., Ltd. (Shenzhen)
- China Nuclear Power Technology Research Institute
- Suzhou Nuclear Power Research Institute
- China Techenergy Co., Ltd.
- Guangdong Daya Bay Nuclear Environmental Protection Co., Ltd.

### Financial & Comprehensive Services

CGN Finance Co., Ltd.

CGN Insurance Broking Co., Ltd.



CGNPC International Financial Leasing Co., Ltd. CGN Industrial Investment Fund Management Co., Ltd. China General Nuclear Power Services Corporation CGN (Beijing) Nuclear Technology Application Co., Ltd.

# **Transparent Public** Communication



- Improving the overall quality and professional skills of employees based on its "Egret Plan"



# Opinion Leaders -- Engaging in dialogue with non-gov-ernment organizations (NGO)

# •••

openness and transparency"



Society and Public

- Nuclear Safety Information Disclosure Platform



Associations and organizations

- Participating in the seminars and meetings organized by relevant industrial associations



# Neighboring Communities

# Two Internet Users Measured the Radiation Level

University of Science & Technology obtained the radiation values all the way to Daya Bay Nuclear Power Base with their own radiation meters used in the laboratory of the University, as follows:

 $0.17 \sim 0.19$ µSV/hr\*

The nuclear power plants in operation in 2013 **5** operation occurrences at level **0** disclosed Information on operation, emergency and management released for over **100** times **6** regular press conferences in 2013 Six Nuclear Power Bases open to the public Over **500** public representatives attracted A series of popularization activities on nuclear power science in **31** schools in Wafangdian, Liaoning province A total of **60,000** people answered the questionnaires on its webpage for nuclear power science popularization Annual page view numbering **1,000,000** 

CGN has put in place the Nuclear and Radiation Safety Information Report and Disclosure System and the NPP Operation Safety Information Disclosure Platform, under which any operation occurrence at level 0 or above shall be disclosed to the public within 2 working days. CGN has published the information on nuclear safety and engineering construction and the key scientific research achievements in time, and donated for the public welfare undertakings; CGN has issued the first White Book of Safe Development in the nuclear power industry in China. On August 7, 2013, CGN invited people from all walks of life to get an in-depth view of the six Nuclear Power Bases and sponsored the "Forum on Transparent Responsibility" for their exchanges and communication. CGN has started to establish a long-term effective nuclear power technology popularization mechanism based on its nuclear power science popularization facilities, galleries and open courses to improve public awareness of nuclear and other forms of clean energy. CGN has opened a special zone "The Universe in a Nucleus" in the Guokr.com where many science and technology geeks like to gather and created a webpage for nuclear power science popularization with an interesting test "Test Your Uranium Content".

#### Natural Energy Powering Nature







Power Base:



![](_page_19_Picture_3.jpeg)

# **Brand Slogan** Natural Energy Powering Nature

**Codes of Conduct For Management** Role model, Business savvy, Caring for staff, Justness and integrity

# Contact us

![](_page_20_Picture_1.jpeg)

## For more interesting information:

红沿河核电

![](_page_20_Picture_3.jpeg)

湾里湾外

![](_page_20_Picture_4.jpeg)

A special zone in Guokr.com: Test Your Uranium Content the Universe in a Nucleus

#### Disclaimer:

CGN assures the authenticity and accuracy of information contained herein, free from any false representation, misleading statements or material omissions.

台核故事

苏州热工研究院

Unless otherwise specified, all data collected herein has been updated as of the end of April 2014.

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