Vietnam

(Updated 2012)

1. GENERAL INFORMATION

1.1. Country overview

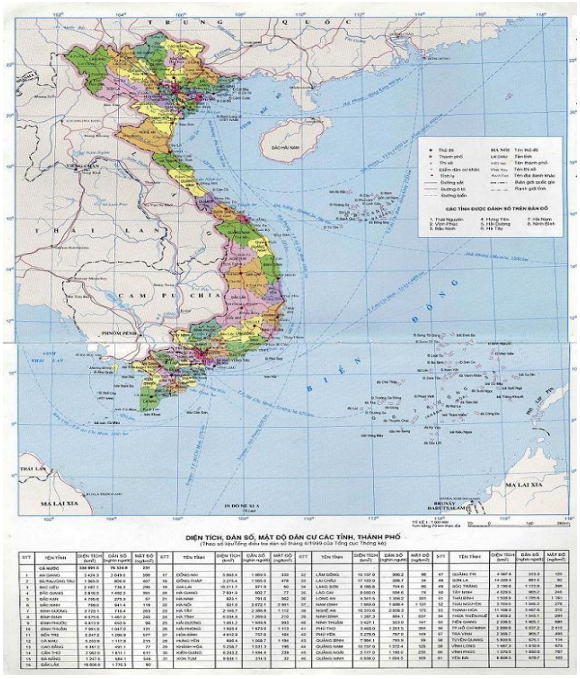
1.1.1. Governmental System

The Government is an executive agency of the National Assembly, and is the highest administrative agency of the Socialist Republic of Vietnam. The Government is subjected to the mechanism of supervision by and reporting to the National Assembly, the Standing Committee of the National Assembly, and President. Government term is 5 years. The head of the Government is the Prime Minister; under whom are Deputy Prime Ministers, the Ministers and the Heads of ministerial-level agencies.

The Government of Vietnam has 18 ministries and 4 ministerial-level agencies. In addition, there are 8 agencies directly under the Government Office.

Vietnam comprises 59 provinces and 4 cities, directly under the central government. Administrative system of Vietnam includes three levels:

- Province and city directly under the central government;
- District, town or city directly under province; and
- Ward, commune, town directly under district.



1.1.2. Geography and Climate

Vietnam is located in the Indochina peninsula, within the Southeast Asia region. Its territory runs along the east coast of the peninsula. Vietnam has a land border with China (1,281 km), Laos (2,130 km) and Cambodia (1,228 km), and a 3,444 km coastline contiguous to the Gulf of Tonkin, the East Sea and the Gulf of Thailand.

Vietnam has an area of 331,051 km², including approximately 327,480 km² land and more than 4,200 km² marine aquatic internal, with more than 2,800 islands, large and small, near and offshore, including Hoang Sa and Truong Sa islands. There are local marine areas, territorial waters, and an exclusive economic and continental shelf with an area of over 1 million km². Terrain is covered with hills (40%) and mountains covered in forests (40%), while flat land accounts for less than 20% of territory. The north consists of plateaus and the Red River Delta, which covers an area of about 14,862 km^2. Central Vietnam is coastal lowland, with plateaus and the Truong Son Mountain Range, while the south has the Mekong River Delta, which covers an area of about 40,604 km^2. The highest point of Vietnam is 3,143 m, at the top of Phan Si Pan, of the Hoang Lien Son mountain range. Arable land accounts for 17% of the total land area of Vietnam. Vietnam has many mineral mines, natural forests and offshore oil and gas reserves.

Vietnam's climate is tropical monsoon in the south, with two seasons (the rainy season from mid-May to mid-September, and the dry season from mid-October to mid-April), and monsoon climate in the north, with four distinct seasons (Spring, Summer, Autumn and Winter). Lying along the coast, Vietnam's climate is conditioned in part by sea currents and takes many factors of maritime climate. Relative average humidity is 84% throughout the year. Vietnam has annual rainfall from 1,200 to 3,000 mm, about 1,500 to 3,000 hours of sunshine per year and temperatures ranging from 5° C to 37° C. Vietnam must often work to prevent storms and flooding, with 5 to 10 storms per year.

1.1.3. Population

As of 31 December, 2010, the population of the country is estimated at 86.927 million, of whom 70.5% live in rural areas and 29.5% in urban areas. Major urban centres are Ha Noi, Da Nang, and Ho Chi Minh City, where population and population densities are as follows:

- Ha Noi: 6,561 million and 1,962 inhabitants/km^2
- Da Nang: 0.926 million and 722 inhabitants/km^2
- Ho Chi Minh City: 7,396 million and 3,530 inhabitants/km^2

The country's average population density is 263 inhabitants/km^2, although density varies from one area to another. It is approximately 939 in the northern Red River Delta, 426 in the southern Mekong Delta, 197 in the Northern Central and Central coastal areas, 117 in the Northern midland and mountain areas, and only 95 inhabitants/km^2 in the Central Highlands.

TABLE 1. POPULATION INFORMATION

							Average annual growth rate (%)
Year	**1970**	**1980**	**1990**	**2000**	**2005**	**2010**	**2000 to 2010**
Population (millions)	41.7	53.7	66.0	77.63	83.11	86.927	1.17
Population density (inhabitants/km²)	125	161	200	234	251	263	1.17
Urban Population as % of total				24.12	27.10	29.5	2.03
Area (1000 km²)						331	

* Latest available data
Source: Vietnam General Statistical Office (http://www.gso.gov.vn)

1.1.4. Economic Data

The period 2001-2005 was host to significant innovations in Vietnam's economic growth, economy structure transition, hunger elimination and poverty reduction and in foreign investment attraction. These created important driving forces, contributing to the success of the country's socio-economic development goals.

The GDP average annual growth rate in the period 2000-2010 reached 7.26%. The GDP per capita increased from US$ 402 in 2000 (at constant 2000 US$) to US$ 1,169 at current 2010 US$ (equivalent to US$ 868 at constant 2000 US$).

Density of economic sectors in 2010: agriculture, forestry & fishing 20.58%, industry and construction 41.09%, services 38.33%.

TABLE 2. GROSS DOMESTIC PRODUCT (GDP)

							Average annual growth rate (%)
	1970	1980	1990	2000	2005	2010	2000 to 2010
GDP (millions of current US$)				31.5	52.9	104	12.7 or 7.26 at constant price of 1994**
GDP (millions of constant 2000 US$)				31.5	47.2	77.5	9.42
GDP per capita (PPP* US$/capita)				1,966	2,571	3,181	
GDP per capita (current US$/capita)				402.0	642.0	1,169	
Average exchange rates (VND/US$)				*14,151*	*15,864*	*19,050*	

* PPP: Purchasing Power Parity
** Vietnam use constant price of 1994 for Average Annual GDP Growth Rate
Source: General Statistics Office of Vietnam (www.gso.gov.vn)

Three national economic development scenarios for the period 2010-2030 are developed, with potential GDP average annual growth rates (%) shown in the following table:

	2011-2015	2016-2020	2021-2030
Low Scenario	7.0	7.0	7.2
Base Scenario	7.5	8.0	7.8
High Scenario	8.0	8.4	8.6

1.2. Energy Information

1.2.1. Estimated available energy

TABLE 3. ESTIMATED AVAILABLE ENERGY SOURCES

	Estimated available energy sources				
	Fossil Fuels		Nuclear	Renewables	
	Solid (surveyed data as of 1st Jan. 2005)	**Liquid and Gas (Bill. TOE)**	**Uranium (U_3O_8 content > 0.015)**	**Hydro**	**Other Renewable and small hydro**
Total amount in specific units*	5,883	Estimated: 3.8 - 4.2 Ascertained 1.05 - 1.14	254,000	- Technical Potential: 31000 - Economic & Technical Potential: 18 - 20	5,300
Total amount in Exajoule (EJ)	246,309.44	Estimated: 159.1 – 175.85 Ascertained: 43.96 – 47.73	21,031.2	- Technical Potential: 0.11 - Economic & technical Potential: 0.06 – 0.07	0.2

* Solid, Liquid & Gas: Billion TOE; Uranium: Metric tons; Hydro, Renewable: GW
Source: Pre-FS Report on the Ninh Thuan NPP Project, IE, Aug. 2009

1.2.2. Energy Statistics

TABLE 4. ENERGY STATISTICS (*Unit: KTOE*)

					Average annual growth rate (%)
	1990	**2000**	**2005**	**2010**	**2000 to 2010**
Energy consumption**					
- Total	19546	32235	44248	63824	7,1%
- Solids***	2212	4372	8342	14730	12,9%
- Liquids(*)	2860	7917	12336	19434	9,4%
- Gases	7.7	1441	4908	8316	19,2%
- Nuclear					
- Hydro	2063	4314	3835	6235	3,8%
- Other Renewables	12421	14191	14794	14710	0,4%
Energy production					
- Total		26990	62976	69619	9,9%
- Solids***		13137	19092	24646	6,5%
- Liquids(*)		9076	19051	15712	5,6%
- Gases		1194	6204	8316	21,4%
- Nuclear					

- Hydro		3583	3835	6235	5,7%
- Other Renewables			14794	14710	
Net import (Import - Export)					
- Total			17150	7100	

Source: Institute of Energy (IE)
Energy consumption**= total primary supply
*** Solid fuels include total of coal
(*): liquids: include Crude oil

1.2.3. Energy policy

The National Strategy on Energy Development to 2020 outlook to 2050 has made the following policies:

a) Policy to ensure national energy security

Give priority to the implementation of policy to ensure national energy security-oriented synchronous development of energy resources, exploitation and economical use of energy resources in the country, reductions in dependence on imported petroleum products, reasonable import and export of coal (with the immediate reduction of export coal each year), linkage of energy systems in the region, expansion of the oil stockpile, and the combination of energy security and national defense and national security.

b) Policy on energy prices

Energy price policy is considered one of the breakthrough policies, quickly eliminating monopolies, with subsidies in both production and consumption of energy. Energy prices should be determined in accordance with market mechanisms, while the State regulates energy prices through tax policy and other management tools.

c) Investment policies for the development of new and renewable energy sources, bio-fuels, nuclear power

Prioritize the development of new energy, renewable energy, bio-fuels, and nuclear power. Encourage investment into foreign countries to seek out energy sources, and make policies to ensure equality between the economic sectors involved in energy development.

d) Policy on energy saving and efficient uses

Policies to encourage energy saving and efficient use should determine the specific requirements of savings for energy-intensive industries, and should encourage the use of new energy-saving equipment and technologies.

e) Environmental protection policy

Environmental protection policy aims to ensure the implementation of mining and energy production with better environmental management and with the application of advanced reasonable environmental standards.

Other relevant policies include *Organizational restructure of energy sector and Establishment of competitive energy market*; *Energy*

Science and technology development; *International cooperation*; and *Energy export and import*.

1.3. Electricity system

1.3.1. Electricity policy and decision making process

Electricity Policy

- Ensure electricity supply security
- Diversify investment types for development of electricity generation sources and transmission
- Step-by-step privatisation of power plants and distribution companies
- Separate public benefit activities from business activities, while continuing subsidies for electricity activities in remote areas
- Enhance international cooperation and integration
- Step-by-step establishment and development of the electricity market
- Study nuclear power development
- Ensure sustainable development; minimize impact to the environment

Some Implementation Measures:

Electricity Price

- At present, the government continues to directly manage electricity price to customers.
- The price is gradually adjusted to meet the long-term margin costs of the system.

Mobilization of investment sources

- Issue domestic and foreign bonds
- Establish joint-ventures with foreign and domestic companies and businesses
- Privatise power companies
- Call upon foreign investments: FDI, ODA, loans...

Establish and develop electricity market

- Separate functions of State management from electricity businesses. Electricity businesses only have functions of management for production and for the carrying-on of business.
- Establish a regulatory body responsible for making decision on electricity price and legal issues related to electricity activities.
- Restructure the electricity branch into generation, transmission, and distribution. Commercialise each field, step-by-step.

Decision making process

Decisions for electricity development include strategy, program, master plan,

and project. Strategy and program reflect the long-term strategic viewpoint of the government; master plan makes development planning for a period of 10-15 years (updated every 5 years); project is for concrete construction or extension of electric power plant(s), transmission network, et cetera.

Before making a decision, the government assigns a ministry (called assigning ministry) to prepare a draft document and send it to the relevant ministries and agencies for review, comment and suggestion. Based on these opinions, the assigning ministry will finalize the draft document.

The assigning ministry will submit this final draft document to the Prime Minister. Depending on the document type, approval will be given by the National Assembly, Government or Prime Minister.

1.3.2. Structure of electric power sector

The status of electricity system in Vietnam

By the end of 2010, the total installed capacity is 21,542 MW. Available capacity is 19,713 MW, while Pmax is 15,416 MW. The total amount of electricity generation reached 100,502 GWh, of which hydro comprised 27.53%, coal-fired 17.55%, gas-fired 0.55%, oil-fired 3.7%, gas turbine and diesel 45% and imports 5,6%. Commercial electricity consumption reached 86,925 GWh.

Electricity generation increased from 31,138 GWh in 2001 to 100,502 GWh in 2010. The average annual electricity generation growth rate is 13.8%.

The status of the electricity transmission grid:

By the end of 2010, the 500 kV transmission lines system covers a total length of **3,890 km**, while the total capacity of the 500 kV transformer stations is **10,650 MVA**. The total length of the 220 kV transmission lines is **10,015 km**, while the total capacity of 220 kV transformer station is **22,004 MVA**.

Main organizations

* Government

  The owner of capital, assets, as property of the State; decides on price tariff for end-customers; enacts decisions, decrees, regulations and approves planning and plans for electricity development.

* Ministry of Industry and Trade (MOIT)

  Manages and regulates electricity activities and uses; directs the implementation of decrees issued by the Government; enacts specific regulatory documents; organizes the formulation and appraisement of the planning and plans for electricity development.

* General Directorate of Energy

  The Energy Department is an agency under the MOIT which functions to assist the MOIT Minister in effecting State management of the oil and gas, electricity, new energy and renewable energy industries, in accordance with the provisions of law.

* Electricity Regulatory Authority of Vietnam

  Electricity Regulatory Authority is an agency under the MOIT, which functions to assist the MOIT Minister in State management for regulating competitive electricity market activities and advises the

MOIT Minister on decisions on cost frames of electricity generation, wholesale, transmission and distribution, and on other services in the competitive electricity market and licensing electricity activities.

* Vietnam Electricity (EVN)

Vietnam Electricity (EVN) is the unique state-owned utility in Vietnam, operating under the management of the MOIT. Under EVN, there are electric power Companies, transmission companies.

* Non-EVN Electricity Generation Companies

At present, there are BOT and IPP, joint-stock electricity power generation and distribution companies. By the end of 2010, total installed capacity of non-EVN electricity generation companies accounted for **32.2% (6,930 MW)** of total electricity installed-capacity of Vietnam.

1.3.3. Main indicators

TABLE 5. ELECTRICITY PRODUCTION, CONSUMPTION AND CAPACITY

							Average annual growth rate (%)
	1970	1980	1990	2000	2005	2010	2000 to 2010
Capacity of electrical plants (MW)							
- Thermal*	400	890	1400	1687	2114	4960	11,4%
- Hydro	160	250	680	3292	4201	8124	9,5%
- Nuclear	0	0	0	0	0	0	
- Wind	0	0	0	0	0	0	
- Geothermal	0	0	0	0	0	0	
- other renewable**		40	50	1256	6315	8458	21%
- Total	560	1180	2120	6235	11576	21542	13,2%
Electricity production (GWh)							
- Thermal*	1510	2900	3350	5907	11829	22189	14,2%
- Hydro	620	1200	5370	14550	16945	27550	6,6%
- Nuclear	0	0	0	0	0	0	
- Wind	0	0	0	0	0	0	
- Geothermal	0	0	0	0	0	0	
- other renewable**		110	0	6103	25226	50763	23,6%
- Total [(1)]	**2130**	**4100**	**8720**	**26561**	**54040**	**100502**	**14,2%**
Total Electricity consumption (GWh)	2120	4210	8720	22397	45603	86925	14,5%

(1) Electricity transmission losses are not deducted.
(*): Thermal coal PP
(**): Other and renewable
Source: IE

TABLE 6. ENERGY RELATED RATIOS

	1970	1980	1990	2000	2005	2010
Commercial Energy consumption per capita (GJ/capita)	4.4	2.66	2.76	6.53	11.1	17.4
Electricity consumption per capita (kWh/capita)	49.6	78.4	131.8	289	567	1000
Electricity consumption/ Final Energy consumption (%)	3.36	6.81	12.6	16.3	18.2	20.7
Nuclear/Total electricity (%)	0	0	0	0	0	0
Ratio of external dependency (%) (1)	0	0	0	0	0	0

(1) Net import / Total energy consumption.
Source: IE

Forecasting electricity demand period 2010-2030

According to economic development (GDP growth rate) scenarios, electricity development scenarios for the period from 2011-2030 are formulated.

a) The average annual electricity demand growth rates (%)

Commercial Electricity Growth				Electricity Generation Growth			
Period	**Low**	**base**	**High**	**Period**	**Low**	**base**	**High**
2006-2010		13.7%		**2006-2010**		13.3%	
2011-2015	13.1%	14.4%	16.3%	**2011-2015**	13.0%	14.2%	16.1%
2016-2020	9.1%	11.3%	11.6%	**2016-2020**	8.9%	11.1%	11.4%
2021-2030	7.1%	7.8%	8.8%	**2021-2030**	7.0%	7.8%	8.7%

b) Electricity demands - *Base Scenario*

	Unit	2010	2015	2020	2025	2030
Com. Electricity	GWh	86,756	169,821	289,882	430,867	615,205
Electricity Generation	GWh	100,071	194,304	329,412	489,621	695,147
Capacity	MW	16,048	30,803	52,040	77,048	110,215

c) Installed Capacity Structure (2010-2030) - *Base scenario (MW)*

	2010	2015	2020	2025	2030
Hydro & Pump Storage	7,416 (34.8%)	14,006 (32.6%)	17,701 (26.4%)	20,401 (21.1%)	22,501 (16.4%)
Oil & Gas - fired	7,724 (36.3%)	10,912 (25.4%)	12,595 (18.7%)	17,285 (17.9%)	17,285 (12.6%)
Coal - fired	3,940 (18.5%)	15,255 (35.5%)	30,765 (45.9%)	44,790 (46.3%)	76,310 (55.7%)
Import	1,000 (4.7%)	1,073 (2.5%)	1,839 (2.7%)	3,509 (3.6%)	5,259 (3.8%)
Renewable	678 (3.2%)	1,679 (3.9%)	3,129 (4.7%)	4,829 (5.0%)	4,929 (3.6%)
Nuclear			1,000 (1.5%)	6,000 (6.2%)	10,700 (7.8%)

2. NUCLEAR POWER SITUATION

2.1. Historical development and current organizational structure

2.1.1. Overview

Since 1996, studies on sustainable energy development, including those taking into consideration of the role of nuclear power in the national energy system, have been being carried out in Vietnam. Many ministries, organizations, universities, and research institutes have been involved in these studies.

During the period 1996-2011, the Government of Vietnam has approved and provided financial budgets to the following programme and projects:

- National Programme on Sustainable Energy Development (1996-2000)
- Project on General Study on the Introduction of Nuclear Power into Vietnam (1996-1999)
- Project on Study and Elucidation of the Aspects of Nuclear Power Development in Vietnam (2002-2004)
- Project on Formulation of the Strategy for Atomic Energy Utilization for Peaceful Purposes up to 2020 (approved on the 3rd January 2006 by the Prime Minister)
- Project on Pre-Feasibility Study for Construction of the First Nuclear Power Plant in Vietnam (2002-2004), extended to 2009
- Master Plans for National Electricity Development in the period 2011-2020 with vision to 2030 (called Master Plan No. 7)

2.1.2. Current organizational chart(s)

The Prime Minister and one Deputy Prime Minister lead the preparation for the nuclear power program. All NPP-related issues are reported directly to the Prime Minister, the Deputy Prime Minister or to the Ministers in charge.

Under the direction of the Government, many ministries, organizations, and universities have been involved in nuclear power development in Vietnam, namely:

- Ministry of Industry and Trade (MOIT), and its subsidiary body: Vietnam Electricity (EVN)
- Ministry of Science and Technology (MOST) and its subsidiary bodies: Vietnam Atomic Energy Institute (VINATOM), Vietnam Agency for Radiation Protection and Nuclear Safety (VARANS), and Vietnam Atomic Energy Agency (VAEA)
- Ministry of Construction (MOC)
- Ministry of Planning and Investment (MPI)
- Ministry of Finance (MOF)
- Ministry of Education and Training (MOET)
- Ministry of Natural Resources and Environment (MONRE)
- Ministry of Defence (MOD)
- Ministry of Public Security (MOPS)

- Ministry of Information and Communication (MOIC)
- Ministry of Foreign Affairs (MOFA)
- Ninh Thuan People's Committee

In order to direct and manage the implementation of Ninh Thuan 1 & 2 NPP Projects, as well as human resources development, the following organizations have been established:

- State Steering Committee for Ninh Thuan NP Project, led by a Deputy Prime Minister (2010)
- State Steering Committee for Project on Training and Developing of Human Resources in the Field of Atomic Energy up to 2020, led by a Deputy Prime Minister (2011)
- Ninh Thuan Nuclear Power Plant Projects Management Board (2011) under the EVN

2.2. Nuclear power plants: Overview

2.2.1. Status and performance of nuclear power plants

Not applicable.

2.2.2. Plant upgrading, plant life management and license renewals

Not available.

2.3. Future development of Nuclear Power

2.3.1. Nuclear power development strategy

Main Decisions

Over the past years, the Government of Vietnam has pursued consistent policies on safe, secure and peaceful uses of nuclear energy.

In January 2006, the Prime Minister decided to launch the Strategy for Peaceful Utilization of Atomic Energy up to the year 2020, which determines the objectives and road-map for atomic energy development in Vietnam, for both non-power and power applications.

In 2007, the Prime Minister approved Master Plan for Electricity Development up to 2020 and Vision to 2050, which stated that the first nuclear power plant would be put into commercial operation by 2020.

In June 2008, Vietnam's National Assembly approved the Atomic Energy Law. The Law came into force on 1st January, 2009.

In November 2009, Vietnam's National Assembly approved government plans to build the first two nuclear power plants.

In December 2009, Vietnam decided to choose Russia as a partner for the Ninh Thuan 1 NPP Project.

In October 2010, Vietnam decided to choose Japan as a partner for the Ninh Thuan 2 NPP Project.

In June 2010, the Prime Minister approved Master Plan for the Implementation of the Strategy for Peaceful Utilization of Atomic Energy up to 2020.

In July 2010, the Prime Minister approved the Orientation of Planning for Nuclear Power Development in Vietnam up to 2030.

In July 2011, the Prime Minister approved Master Plan on Electricity Development, period 2011-2020, with vision to 2030. According to the Master Plan:

- Ninh Thuan 1 consists of 4 units x 1,000 MW, with construction of the first unit planned to start by the end of 2014. Units 1 & 2 will be put into operation in 2020-2021, Units 3 & 4 in 2024-2025.
- Ninh Thuan 2 consists of 4 units x 1,000 MW, and construction of the first unit is to start by end of 2015. Units 1 & 2 will be put into operation in 2021-2022, Units 3 & 4 in 2026-2027.
- From 2020 to 2027, there will be about 1,000 MW of NP to be added to national electricity system every year. 2 units x 1,350 MW will be added in 2028-2029. By 2030, there will be 10 units in operation, with a total capacity of 10,700 MW.
- Vietnam's NP capacity will increase from 1,000 MW (1.5%) in 2020 to 6,000 MW (6.2%) in 2025, and to 10,700 MW (7.8%) in 2030.

Project framework (time scales, number of units, etc.).

The first two nuclear power plants, called *Ninh Thuan 1* and *Ninh Thuan 2*, will be located at Phuoc Dinh and Vinh Hai of Ninh Thuan Province, in the Southern Central of Vietnam. The total capacity of the two NPPs is 4,000 MW (2 units x 1,000 MW at each site).

- Type of contract (Turnkey, Split Package, Multi Packages): EPC (Engineering, Procurement, and Construction)
- Application of nuclear power: electricity supply
- Policy for nuclear fuel cycle:
  - The NPPs will use imported nuclear fuel.
  - Integration of the contract on nuclear fuel supply into the contract on NPP building.
  - Determination of long-term nuclear fuel suppliers, especially setting up cooperative relationships with the countries of high uranium reserve. At the same time, diversification of suppliers to secure nuclear fuel supply.
  - Survey and exploration of Vietnam's uranium reserve, in order to determine capability for processing nuclear fuel from domestic uranium.
- Strategy for funding long term spent fuel handling and final disposal, waste management and decommissioning: not currently available.

TABLE 8. PLANNED NUCLEAR POWER PLANTS

Station/Project Name	Type	Capacity (MW)	Expected Construction Start Year	Expected Commercial Year
Unit 1, Phuoc Dinh / Ninh Thuan 1		1000	2014	2020

Unit 2, Phuoc Dinh / Ninh Thuan 1		1000	2015	2021
Unit 1, Vinh Hai / Ninh Thuan 2		1000	2015	2021
Unit 2, Vinh Hai / Ninh Thuan 2		1000	2016	2022

**** Note:** The data above is based on the Pre-FS Report and is still preliminary data. The final decision on the NPP building plan should be approved by Vietnam's National Assembly once the Government submits the FS Report.*

2.3.2. Project management

On 5 March, 2002, the Prime Minister signed Decision on Establishment of the Governmental Steering Committee for Pre-FS on the construction of the first nuclear power plant in Vietnam. The Committee consists of the Minister of Industry, Vice-Ministers, and senior officials from relevant ministries, agencies, and institutions. The Committee has several functions similar to a NEPIO.

As assigned by the Prime Minister, the Ministry of Industry and Trade (MOIT) is responsible for conducting Pre-FS on the first NPPs. The Ministry of Science and Technology (MOST) is responsible for formulating the Vietnam Strategy for Peaceful Utilization of Atomic Energy up to 2020, and conducting studies and elucidation of the aspects of nuclear power development in Vietnam.

In August 2008, MOST established an inter-agency working group to coordinate the preparation of the Master Plan's projects in order to implement the Atomic Energy Strategy. A MOST Vice-Minister heads the working group.

Under the control of the MOIT, Vietnam Electricity (EVN) is responsible for conducting Pre-FS and FS and is the investor, owner and operator of the Ninh Thuan 1 and Ninh Thuan 2 NPPs.

On 4 May 2010, the Prime Minister signed Decision on Establishment of the State Steering Committee for Ninh Thuan Nuclear Power Project led by a Deputy Prime Minister with Minister of Industry and Trade as its Permanent Vice-Head. The State Steering Committee has the following functions and duties:

- To provide direction, strategies for development of NP and other priority areas in each development phase
- To issue guidance and make policies on NP development, specifically policies on acquiring, owning and developing NPP technologies and nuclear fuel, on the exploitation and uses of uranium on radioactive environmental monitoring and on radioactive waste management
- To direct, supervise, and coordinate activities of the ministries and of ministerial-level and governmental-level agencies in implementing NP program
- To advise the Prime Minister on important issues for NP development.

2.3.3. Project funding

Generally, EVN will be the investor for the first four NP units. A proposal for financial arrangements for these units is as follows:

- EVN will provide 15-25% of the total investment costs.

- Loan: 75-85% of the total investment costs will be covered under the export credits with one or several Export Credit Agencies (ECAs), in conjunction with loans from commercial banks and/or the issuing of domestic and international bonds.
- The Government will apply support measures for investing in and financing NPP projects, such as loan guarantee and bond issuing, investment for infrastructure development and resettlements.

However, in the process of selecting foreign partners of the Ninh Thuan NP Projects, the Vietnamese Government put forwards 6 criteria/requests, including that the selected partner must provide low-interest and preferential loans for the Project.

So far, Russia and Japan have been chosen as partners of Ninh Thuan 1 and Ninh Thuan 2 NPP Projects, respectively. Russia and Japan are committed to providing Ninh Thuan 1 and Ninh Thuan 2 NPP Projects with low-interest and preferential loans.

2.3.4. Electric grid development

Along with decision on NPP construction, the government decided to upgrade and expand the 500 KV and higher electric grid at the Southern Central, where the first NPPs will be constructed and put into operation in the period 2020-2025.

2.3.5. Site Selection

According to Planning Orientation on Nuclear Power Development in Vietnam up to 2030, 8 potential sides have been preliminarily determined, of which the following two sites for the first NPPs have been selected:

- Ninh Thuan 1 NPP at Phuoc Dinh commune, Ninh Phuoc district, Ninh Thuan province
- Ninh Thuan 2 NPP at Vinh Hai commune, Ninh Hai district, Ninh Thuan province

2.4. Organizations involved in construction of NPPs

Not currently available.

2.5. Organizations involved in operation of NPPs

- Vietnam Electricity (EVN) is investor and will be the owner and operator of the Ninh Thuan 1 and Ninh Thuan 2 NPPs.
- Institute of Energy (IE) has been working as a consultant.
- Vietnam Atomic Energy Institute (VINATOM) and some others will be Technical Support Organizations (TSOs).

2.6. Organizations involved in decommissioning of NPPs

Not available.

2.7. Fuel cycle including waste management

Radioactive wastes, including spent fuels, will be stored temporarily (for about 30 years) at the relevant nuclear power plants. At present, the Ministry of Construction, in collaboration with relevant institutions, is conducting studies for location planning of a national radioactive waste repository. Strategies for fuel cycle and waste management will be developed.

2.8. Research and development

2.8.1. R&D organizations

Vietnam Atomic Energy Institute (VINATOM)

VINATOM (its old name is VAEC) operates under MOST control and management. The VINATOM comprises the following institutions:

1. Da Lat Nuclear Research Institute (DNRI)
2. Center for Application of Nuclear Technique in Industry (CANTI) in Da Lat
3. Institute for Nuclear Science and Technology (INST) in Ha Noi
4. Institute for Technology of Radioactive and Rare Elements (ITRRE) in Ha Noi
5. Ha Noi Irradiation Center (HIC)
6. Center for Nuclear Technique in Ho Chi Minh City (CNT)
7. Research and Development Center for Radiation Technology (VINAGAMMA)
8. Nuclear Training Center (NTC)
9. Non-destructive Evaluation Center (NDE)
10. Technology Application and Development Company (NEAD)

The functions and duties of the VINATOM

1. Conduct fundamental and applied research on nuclear science and engineering, nuclear reactor technology, nuclear fuel and material,

radiation protection and nuclear safety, and radioactive waste management technology, in service of the economic development of the country.

2. Develop technology, production and technical services in atomic energy and related fields, in service of social and economic development.
3. Study and formulate directions, strategies, planning and plans for atomic energy development in Vietnam, participate in the formulation of law projects and regulatory documents in relation to atomic energy, and participate in the implementation of nuclear policies approved by the government.
4. Perform international cooperation in the field of atomic energy and participate in the implementation of international treaties pledged by Vietnam.
5. Provide technical support to the State management body on radiation protection and nuclear safety in the appraisal of radiation protection and nuclear safety, carry out radioactive environment monitoring, calibrate radiation facilities and dosimeters and develop technical infrastructures in the preparedness and response to radiological and nuclear incidents and accidents.
6. Participate in the planning and training of scientific and technical professionals in the field of atomic energy.

In addition, some R&D institutions have been involved in the study on the development of nuclear power in Vietnam, such as *Institute of Energy* (IE) and *National Research Institute of Mechanical Engineering* (NARIME) (under the Ministry of Industry and Trade - MOIT), and *Institute of Energy Science* (IES) (under Vietnam Academy of Science and Technology - VAST).

2.8.2. Development of advanced nuclear technologies

Not available.

2.8.3. International co-operation and initiatives

There are co-operative relationships with several foreign R&D institutions, such as JAEA, JNES (Japan), CEA, IRSN (France), KAERI, KIRAM, KIGAM (Korea), JINR (Russia) and Risk Engineering (Bulgaria).

2.9. Human resources development

In August 2010, the Prime Minister approved the Master Plan on Training and Developing of Human Resources in the Field of Atomic Energy from now until 2020, with a total budget of VND 3 trillion (equivalent to US$ 200 million). In 2011, the State Steering Committee for direction to implementation of the Project was established, led by a Deputy Prime Minister, with the Minister of Education and Training as its Permanent Vice-Head.

The Master Plan’s overall objective:

Human resources training in the field of atomic energy must ensure the quantity and quality to meet needs of the nuclear power development programme, requirements for safe and secure development and uses of nuclear energy in the socio-economic fields, and to strengthen national science and technology potential.

The Master Plan's specific objectives:

a) During period 2010-2015

- To plan for and invest in upgrading the system of higher education institutions and professional training centers to meet the human resources needs in the field of atomic energy, with the initial focus to be placed on 5 universities: Hanoi University of Natural Sciences (Hanoi National University), Ho Chi Minh City University of Natural Sciences (Ho Chi Minh City National University), Hanoi University of Technology, Da lat University, University of Electric Power, and with focus placed also on the Nuclear Training Centre under the Vietnam Atomic Energy Institute (Ministry of Science and Technology).
- To reform and improve curricula and course books for specialized training in the field of atomic energy in the direction of advanced, modern theories linked with experiments, in schools linked with research and application.
- To accomplish training and retraining, updating of knowledge, improvement of capacities for management, policy making and legislation, and safety assessment and appraisement for nuclear power project management organizations and the nuclear regulatory body.
- To reform the mechanisms and policies for excellent graduates and undergraduates studying majors in the field of atomic energy, aimed at enhancing the enrolment qualities. To ensure enrolment targets for specialities in the field of atomic energy, at universities nationwide, of at least 250 students each year.

b) By 2020

To have trained sufficient qualified human resources to serve management and application needs and to ensure safety and security in the field of atomic energy, to be able to receive technology transfer, and to operate and maintain nuclear power plants, along with the gradual implementation of localization and self-reliance on technology, namely:

- *Manpower for nuclear power plants:* to have trained 240 engineers at bachelor level and 35 masters and PhD students each year, of whom 20 engineering bachelors and 15 masters and PhD students will have been trained abroad. By 2020, to have trained 2,400 engineers and 350 masters and PhD students specialized in nuclear power, of whom 200 engineers and 150 masters and PhD students will have been trained abroad.
- *Manpower for research, application and ensuring safety and security in the field of atomic energy*: to train 65 engineers at bachelor level and 35 masters and PhD students each year, of whom 30 bachelors and 17 masters and PhD students will have been trained abroad. In 2020, to have trained 650 engineers and 250 masters and PhD students specialized in management, application, and ensuring safety and security in the field of atomic energy, of whom 150 engineers and 100 masters and PhD students will have been trained abroad.
- *Manpower for education and training:* to train 100 masters and PhD students to teach at the educational and training institutions.

- Dispatch to advanced atomic energy countries a 500 man team of managers and scientists, to survey, study experiences and participate in training courses and short-term practice for enhancing their speciality and professional knowledge.

2.10. Stakeholder Communication

The Vietnamese Government attaches great importance to public communication with regards to the programme for nuclear power development in Vietnam, especially after the Fukushima accident. In 2010, MOST was assigned to implement a National Project on Public Relations and Communication on Nuclear Power Development in Vietnam.

The public communication programme is being carried out synchronously with the nuclear power development programme, through regularly and closely coordinating activities of governmental agencies and the relevant institutions in order to provide the public with timely and transparent knowledge and information on nuclear power. The goal is to create and maintain regular interaction and communication with the public, aimed at always gathering public support for the National Long Range Nuclear Power Strategy.

Public information activities are conducted in the various forms:

- Publish and implement communication campaigns in the mass media
- Organize international nuclear power exhibitions
- Organize visits to the NPPs in foreign countries
- Organize workshops and seminars on nuclear power
- Conduct surveys, collect statistics and evaluate of public opinion
- Gradually implement the introduction of nuclear energy knowledge into general education system

3. NATIONAL LAWS AND REGULATIONS

3.1. Regulatory framework

3.1.1. Regulatory Authority

The Vietnam Agency for Radiation and Nuclear Safety (VARANS) was established in 2004. VARANS is under the MOST, and assists the MOST Minister in exercising the state management of radiation protection and nuclear safety.

The functions and duties of VARANS

1. To organize and participate in the building of legislative documents, codes of practice, procedures and regulations for radiation and nuclear safety and control; to participate in the building of standards on radiation and nuclear safety, specific regulations and policies for those who work directly with the radiation;
2. To make and then submit to the Minister policies, development orientations, priorities, programs, annual and 5-year plans on radiation and nuclear safety and control; to organize and implement approved plans;
3. To organize and implement the notification, registration, licensing, renewal, amendment and withdrawal of licenses for radiation and

nuclear establishments, radioactive sources, radiation personnel and works related to radiation and nuclear; to organize the assessment of sites, designs, construction, and justifications for ensuring the radiation and nuclear safety and the security of radiation and nuclear establishments;

4. To guide and direct the Local Departments of Science & Technology on radiation and nuclear safety and control; to co-ordinate with ministries and branches to perform the State management on radiation and nuclear safety and control, under MOST direction;
5. To conduct regulatory inspections on radiation and nuclear safety according to law; to resolve complaints and denunciations; to deal with violations of regulations on radiation safety and control according to law;
6. To perform the State management of radioactive wastes; to organize radiation environment monitoring, and to develop emergency response and handling for radiation and nuclear incidents; to control radiation doses and assess the safety of occupational, public and medical exposure;
7. To organize activities of safeguards;
8. To establish a system of records for data and information on radiation and nuclear safety;
9. To organize research for applying scientific and technological advances in the field of radiation safety and control;
10. To co-organize training courses and information-dissemination programs on legislation, radiation and nuclear safety and safety culture;
11. To organize and develop international cooperation activities in radiation and nuclear safety, as assigned by the Ministry; to participate in the implementation of international treaties and other international agreements on radiation and nuclear safety;
12. To perform other duties assigned by the Minister of Science and Technology; to manage cadres, assets, files and documents of the Agency according to Ministry arrangement and regulation.

In addition, *Electricity Regulatory Authority of Vietnam*, *Agency for Safety Techniques and Industrial Environment* (both under MOIT), and some agencies under other Ministries (e.g. Ministry of Natural Resource and Environment) participate in the licensing process.

3.1.2. Licensing Process

VARANS issues or makes proposals to the MOST to issue licenses for all activities related to radiation, including import and export of radiation sources, radiation works, and radiation facilities. Every year inspection is carried out for some radiation organizations.

Regarding NPP projects, in accordance with Vietnam's Atomic Law, the Prime Minister issues approval of NPP sites, the MOST Minister issues the licence for NPP construction, the MOIT Minister issues the licence for NPP commissioning and operation, and the MOC Minister issues licences to foreign investors for participation in the NPP projects.

3.2. Main national laws and regulations in nuclear power

1. Ordinance on Radiation Safety & Control (ORSC) was passed on June 25th, 1996, by the Standing Committee of the National Assembly of the Socialist Republic of Vietnam, and went into effect on the 1st January, 1997.
2. Decree on the Detailed Directions for implementing of ORSC was enacted on July 16th, 1998, by the Prime Minister of the Socialist Republic of Vietnam and went into effect on the 1st August, 1998.
3. Decree No. 51/2006/NĐ-CP dated May 19, 2006, stipulating regulations on sanctioning against administrative violation in radiation safety and control.
4. Decree No. 87/2006/NĐ-CP regulating the inspection, organization and operation of the Ministry of Science and Technology.
5. Regulations No. 115/2007/QĐ-TTg dated July 23, 2007, on ensuring the security of radioactive sources.
6. Regulations No. 146/2007/QD-TTg dated September 04, 2007, for the recovery and handling of orphan radioactive sources.
7. Joint Circular No. 2237/1999/TTLT/BKHCNMT-BYT between MOSTE and MOH on Guidelines in implementation of radiation safety in medical exposure was enacted on 28 December, 1999.
8. Decree on the penalty for violations of regulations on radiation safety and control was enacted on May 2001, by the Prime Minister of the Socialist Republic of Vietnam.
9. Circular No. 14/2003/TT-BKHCN dated July 11, 2003, guiding radiation transportation safety.
10. Circular No. 05/2006/TT-BKHCN dated January 11, 2006, guiding the procedures of notification, registration and license issuance to radiation activities.
11. Circular No. 10/2006/TT-BKHCN dated March 17, 2006, guiding specialized inspection on radiation safety and control.
12. Decision No. 38/2006/QD-BTC dated July 24, 2006: Regulation of fees and charges for radiation safety assessment and verification.
13. Decision No 3616/2004/QĐ-BYT dated 4 October, 2004, on the issuance of the Regulations on the safety and sanitation of food preserved by irradiation.
14. Document No. 1092/2002/BKHCNMT-ATBX dated May 2, 2002, provisionally regulating license application and conditions for the use of X-ray medical devices.
15. Directive No. 13/2006/CT-BKHCN dated June 07, 2006, on the enhancement of State administration of radiation safety and security.
16. Decision No. 17/2007/QĐ-BKHCN dated August 31, 2007, on the issuance of radioactive sources separation complying with security requirements.
17. Decision No. 32 /2007/QĐ-BKHCN enacting the regulation on examining medical diagnosis X-ray machines.
18. The Atomic Energy Law was approved by Vietnam National Assembly on the June 3rd, 2008, and came into force on January 1st, 2009, replacing the Ordinance on Radiation Safety & Control (ORSC).

19. Decree No. 07/2010/NĐ-CP dated January 25, 2010, on guidance for the implementation of several provisions of the Atomic Energy Law.
20. Decree No. 70/2010/NĐ-CP dated June 22, 2010, on detailed regulation and guidance for the implementation of several provisions of the Atomic Energy Law on nuclear power plants.
21. Decision No. 45/2010/QĐ-TTg dated June 14, 2010, enacting the Regulation on the activities of nuclear control.
22. Decision No. 1636/2010/QĐ-TTg dated August 31, 2010, approving the environmental radioactive monitoring and warning network planning.
23. Decision No. 450/2011/QĐ-TTg dated March 25, 2011, approving the Project on the deployment of measures ensuring security in the field of atomic energy.
24. Circular No. 08/2010/TT-BKHCN dated October 22, 2010, guiding notification and licensing for radiation practices, including export and import of radioactive sources, nuclear materials, source materials, and nuclear equipment.
25. Circular No. 23/2010/TT-BKHCN dated December 29, 2010, on Ensuring Security for Radioactive Sources.
26. Circular No.24/2010/TT-BKHCN dated December 29, 2010, on Issuance of National Technical Regulation QCVN 6/2010-BKHCN on Radiation Protection – Categorization and Classification of Radioactive Sources.
27. Circular No.02/2011/TT-BKHCN dated March 16, 2011, on Safeguards implementation.
28. Circular No. 38/2011/TT-BKHCN dated December 30, 2011, on requirements on physical protection of nuclear material and nuclear facilities.

References

None provided.

Appendix 1: International, Multilateral and Bilateral Agreements

A1.1. International treaties, conventions, and agreements signed/ratified by the country

• Agreement on privileges and immunities	Entry into force	July 1969
• Treaty on Non-Proliferation of Nuclear Weapons (NPT)	Entry into force	June 1982
• Supplementary agreement on provision of technical assistance by the IAEA	Entry into force	May 1983

• Supplementary agreement on provision of technical assistance by the IAEA	Entry into force	May 1983
• NPT related safeguards agreement INFCIRC/376	Entry into force	February 1990
• Improved procedures for designation of safeguards inspectors	Prefers to apply the present system	June 1990
• RCA	Entry into force:	August 1997
• Convention on physical protection of nuclear material	Non-Party	
• Convention on early notification of a nuclear accident	Entry into force	1986
• Convention on assistance in the case of a nuclear accident or radiological emergency	Entry into force	October 1987
• Safeguards Agreement	Entry into force	1989
• Bangkok Treaty: South East Asia Nuclear Weapons Free Zone	Signed	December 1995
• Comprehensive Nuclear-Test-Ban Treaty (CTBT)	Ratified	January 2006
• Additional Protocol	Signed	August 2007
• Vienna convention on civil liability for nuclear damage	Non-Party	
• Joint protocol	Non-Party	
• Protocol to amend the Vienna convention on civil liability for nuclear damage	Non-Party	
• Convention on supplementary compensation for nuclear damage	Non-Party	
• Convention on nuclear safety	Entry into force	July 2010
• Joint convention on the safety of spent fuel management and on the safety of radioactive waste management	Non-Party	
• ZANGGER Committee	Non-Member	
• Nuclear Export Guidelines (INFCIRC/254)	Adopted	
• Acceptance of NUSS Codes	No reply	
• Nuclear Suppliers Group	Non-Member	

A1.2. Cooperation agreements with IAEA in area of NP

A Member State of the IAEA since June 1978, the Socialist Republic of Vietnam has been receiving the Agency's valuable assistance in many areas, contributing to research and development of peaceful, safe and secure uses of nuclear energy in Vietnam.

The IAEA's assistance has covered many nuclear power-related aspects, such as energy and electricity planning, nuclear safety and security, and the development of a legislative system, through providing equipment, materials, experts and man-power training

In 1987, Vietnam received a WASP-III version for PC. That the same year, the IAEA approved TC Project "Computer Center for Reactor Physics (VIE/4/006)“. WASP was installed in the PC Center. Vietnamese researchers and energy planners carried out their energy/electricity planning studies by using WASP at the Center.

From 1987, and particularly since 1996, many Vietnamese staff have participated in the IAEA training courses in WASP energy planning, and many IAEA expert missions have been dispatched to Vietnam.

In 1997, the IAEA approved TC project "Pre-Feasibility Study for Introduction of Nuclear Power in Vietnam (VIE/0/009)". In order to implement the project, two Vietnamese working teams were set up, one for energy planning and economic study, the other for reactor technology, safety etc. Almost all energy-related institutes and universities participated in and benefited by the project.

Since 2000, Vietnam has participated in the following energy-related regional projects: RAS/0/033: Role of Nuclear Power and Other Energy Options in Mitigating Green House Gas (GHG) Emissions; RAS/0/038: Role of Nuclear Power and Other Energy Options in Competitive Electricity Market; RAS/0/041: Tracing Future Sustainable Path through Nuclear and Other Energy Options; RAS/0/045: Formulation of Sustainable Energy Development strategies in the Context of Climate Change.

In order to meet Vietnam’s requirements for support in consideration of launching a nuclear power project, the IAEA focused on assisting Vietnam to solve problems occurring in nuclear power development, through IAEA expert reviews and assessment not only of energy planning and economy, but also of other issues, as suggested in the IAEA Publication: Milestone in the Development of a National Infrastructure for Nuclear Power (IAEA Nuclear Energy Series No. NG-G-3.1), which aims to carry out studies on national infrastructure development for nuclear power. Among the IAEA TC projects for the cycle 2009-2011, there are three projects directly supported nuclear power development in Vietnam, namely, VIE/4/015 "Developing Nuclear Power Infrastructure"; VIE/9/011 "Improving the Capability for the site Characterization and Evaluation of New Nuclear Installation'; and VIE/9/013 "Strengthening the Technical Capacity of the Radiation and Nuclear Safety Regulatory Body". These proved to be very significant for the setting up of the nuclear power program in Vietnam.

A1.3. Bilateral agreements with other countries or organizations signed/ratified by the country in the field of nuclear power

1. Agreement between the Government of the Socialist Republic of Vietnam and the Government of the Republic of India for the co-operation for utilization of atomic energy for peaceful purposes — signed 1986

2. Agreement between the Government of the Socialist Republic of — signed 1996

Vietnam and the Government of the Republic of Korea for the co-operation in the peaceful uses of nuclear energy

3. Agreement between the Government of the Socialist Republic of Vietnam and the Government of the People's Republic of China for the co-operation in the peaceful uses of nuclear energy — signed 2000

4. Agreement between the Government of the Socialist Republic of Vietnam and the Government of the Argentine Republic for the co-operation in the peaceful uses of nuclear energy — signed 2001

5. Agreement between the Government of the Socialist Republic of Vietnam and the Government of the Russian Federation for the co-operation in the peaceful uses of nuclear energy — signed 2002

6. Agreement between the Government of the Socialist Republic of Vietnam and the Government of the Republic of France for the co-operation in the development of peaceful uses of nuclear energy — signed 2009

7. Agreement between the Government of the Socialist Republic of Vietnam and the Government of Japan for the co-operation in development and peaceful uses of nuclear energy — signed 2011

8. Agreement between the Government of the Socialist Republic of Vietnam and the Government of the Russian Federation on Cooperation in Construction of Nuclear Power Plant in the Territory of Vietnam — signed 2010

9. Arrangement between the Government of the Socialist Republic of Vietnam and the Government of Japan on Cooperation in Construction of Ninh Thuan 2 Nuclear Power Plant Project in the Socialist Republic of Vietnam. — signed 2011

APPENDIX 2: MAIN ORGANIZATIONS, INSTITUTIONS AND COMPANIES INVOLVED IN NUCLEAR POWER RELATED ACTIVITIES

NUCLEAR ENERGY AUTHORITY

Ministry of Science, Technology	Tel: 84-4-3943 9731
113, Tran Duy Hung	Tel: 84-4-3943 9733
Ha Noi, Vietnam	http://www.most.gov.vn
Vietnam Agency for Radiation and	Tel: 84-4-3941 0213

Nuclear Safety
113 Tran Duy Hung
Ha Noi, Vietnam

Fax: 84-4-3822 0298
http://www.varans.gov.vn/

Vietnam Atomic Energy Agency
113 Tran Duy Hung
Ha Noi, Vietnam

Tel: 84-4-3941 2972
Fax: 84-4-3941 2970

Ministry of Industry and Trade
54, Hai Ba Trung
Ha Noi, Vietnam

Tel: 84-4-3220 2222
Tel: 84-4-3220 2525
http://www.moit.gov.vn

OTHER ORGANIZATIONS

Vietnam Atomic Energy Institute
59 Ly Thuong Kiet
Ha Noi, Vietnam

Tel: 84-4-3942 3479
Fax: 84-4-3942 4133
http://www.vaec.gov.vn

Institute for Nuclear Science
and Technique (INST)
5T-160, Hoang Quoc Viet
Ha Noi, Vietnam

Tel: 84-4-3836 1432
Fax: 84-4-3836 3295

Nuclear Research Institute (NRI)
1, Nguyen Tu Luc
Da Lat, Vietnam

Tel: 84-63-382 2191
Fax: 84-63-382 1107

Centre for Nuclear Techniques (CNT)
217, Nguyen Trai
Ho Chi Minh City, Vietnam

Tel: 84-8-3835 6568
Fax: 84-8-3836 7381

Institute for Technology of Radioactive
and Rare Elements (ITRE)
48, Lang Ha
Ha Noi, Vietnam

Tel: 84-4-3776 0340
Fax: 84-4-3835 0966

Vietnam Electricity (EVN)

Tel: 84-4-2220 3881

18 Tran Nguyen Han
Ha Noi, Vietnam
Fax: 84-4-2220 1386
http://www.evn.com.vn

Ninh Thuan Nuclear Power Projects
Management Board
16/4 Road, Phan Rang – Thap Cham City
Ninh Thuan Province
Tel: 84-68-224 6979
Fax: 84-68-392 2991

Institute of Energy
6 Ton That Tung
Ha Noi, Vietnam
Tel: 84-4-3852 2532
Fax: 84-4-3773 5361

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