

**Presentation on the International Forum in
Nuclear Nonproliferation and
Peaceful Use of Nuclear Energy**

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**VIETNAM NUCLEAR POWER PROGRAM
AND ITS COMMITMENT TO NONPROLIFERATION**

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1. Introduction

- During last period, the VN Government assigned the Ministry of Industry (MOI) and Ministry of Science & Technology (MOST) in collaboration with the related ministries and organizations to begin conducting studies on the introduction of the nuclear power into VN.
- Based on the results of Demand – Supply Balance, studies have shown that in order to meet the electricity demand around year 2020 and after, Vietnam should take integrated solution as following:
 1. Effectively use all conventional indigenous energy sources: coal, gas, hydropower, as well as renewable energy;
 2. Import electricity from neighboring countries;
 3. Import coal, natural gas, and LNG for electricity production;
 4. Implement Demand Side Management (DSM) for electricity saving and use advanced technology; and
 5. Actively prepare for development of nuclear power.

1. Introduction

- Also based on electricity Demand – Supply Balance, it's showed that the first NPP should be put into operation around the years 2019-2020 with a capacity of about 2,000 MW to 4,000 MW depend on the base and high economic development scenarios respectively.
- on March 2002 VN Government decided to set up Steering Committee for preparation of the nuclear power program.
- The main responsibilities of Committee are as follow:
 1. Establish national strategy and long term program for nuclear development, in charge by VAEC, MOST.
 2. Study on Pre-feasibility for first NPP, in charge by IE, MOI.
 3. Study 7 main aspects for nuclear power program in Vietnam, in charge by VAEC, MOST.
- All these tasks have been completed in 2005 and submitted again to the Governments for consideration and decision.

1. Introduction

- In January 2006, the Prime Minister approved the Strategy for Peaceful Utilization of Atomic Energy up to the year 2020.
- In July 2007, the Prime Minister approved the Master Plan for Implementation of the Long-term Strategy. In this Master action plan, we are implementing 23 projects, in which, there are 10 projects directly related to Nuclear Power Development and other 13 projects related to both: Nuclear Power and Non-Power Application.
- Also in 2007, the Pre-FS for the 1st NPP in Vietnam and the VI Electricity Development Plan up to 2025 have been approved by the Government.

1. Introduction

action plan, 23 July 2007
23 Projects, covering all aspects
of the Strategy

**DEVELOPMENT
OF APPLICATION
OF RADIATION &
RADIOISOTOPES**
5 Projects

**DEVELOPMENT
OF
NUCLEAR POWER**
10 Projects

**DEVELOPMENT
OF SC.&TECH.
POTENTIAL
IN THE FIELD
OF ATOMIC ENERGY**
3 Projects

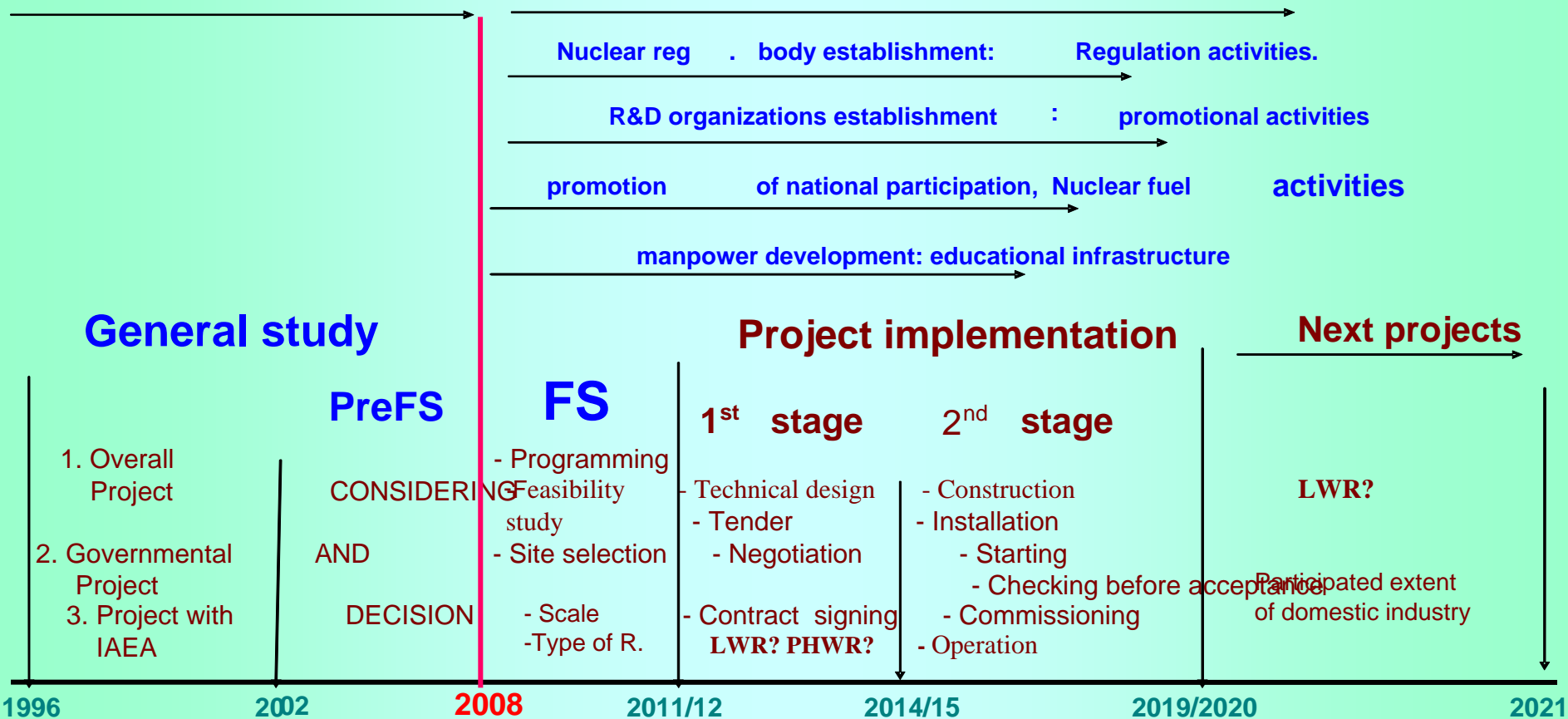
**DEVELOPMENT OF NATIONAL
CAPABILITY FOR ENSURING
RADIATION PROTECTION
AND NUCLEAR SAFETY**
2 Projects

**DEVELOPMENT
ORGANIZATIONAL
AND
MANAGEMENT
SYSTEM**
3 Projects

2. National Plan for Introduction of the First NPP

proposed schedule for Nuclear power program in vn

Nuclear power program planning



2. National Plan for Introduction of the First NPP

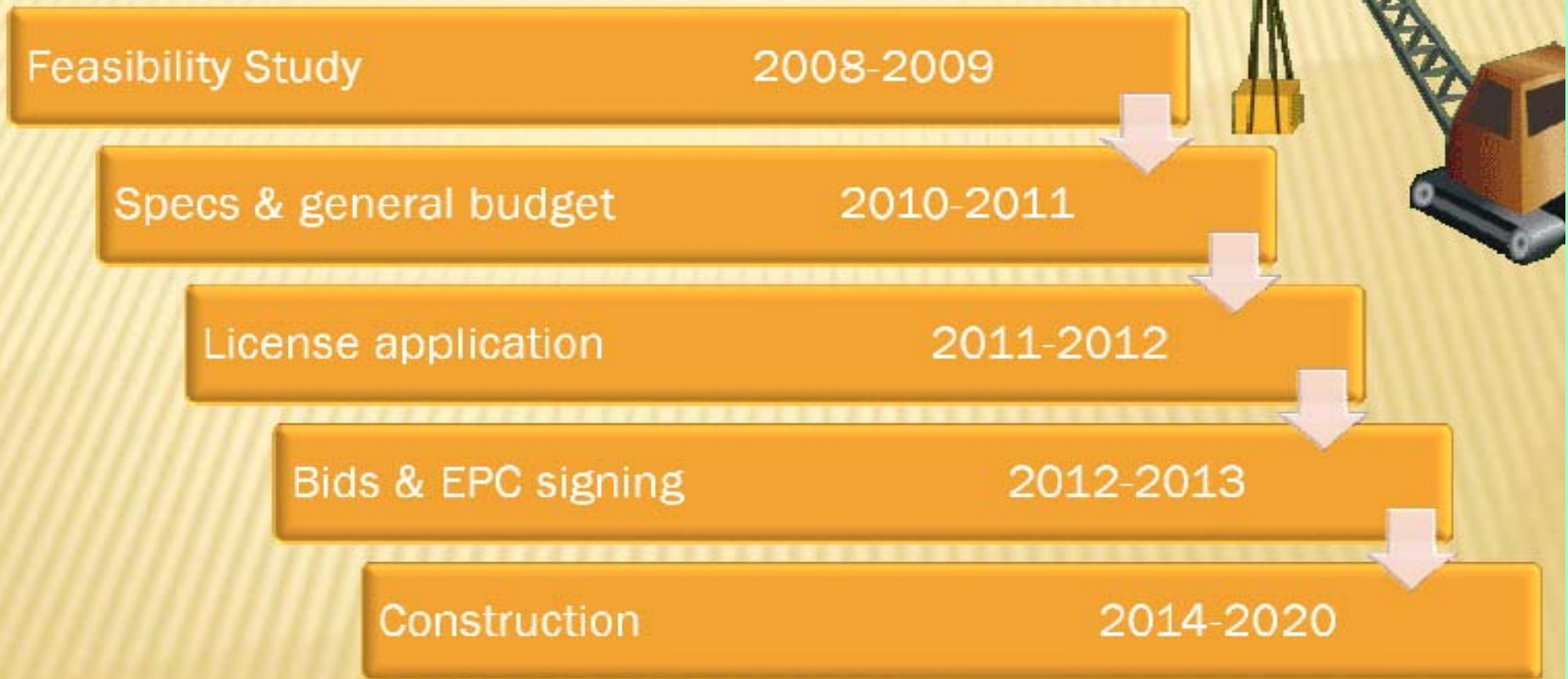
The progress of the Pre-FS as follow:



2. National Plan for Introduction of the First NPP

The progress of the future work as follow:

CONSTRUCTION & PROGRESS



2. National Plan for Introduction of the First NPP

The first nuclear power project

Project title: “Ninh Thuan Nuclear Power Plant”

Investment owner: Vietnam Electricity (**EVN**).

Plants: in Ninh Thuan province.

+ 1st plant:

- × Site: Phuoc Dinh – Ninh Phuoc.
- × Capacity: **2 x 1000 MW**
- × Commercial operation date: 2020

+ 2nd plant:

- × Site: Vinh Hai – Ninh Hai.
- × Capacity: **2 x 1000 MW**
- × Commercial operation date: 2021



2. National Plan for Introduction of the First NPP

Site selection

- ✗ 1st plant:
 - + **Phuoc Dinh** – Ninh Phuoc – Ninh Thuan
- ✗ 2nd plant:
 - + **Vinh Hai** – Ninh Hai – Ninh Thuan
- ✗ At both sites:
 - + Good geologic, seismic & tectonic conditions.
 - + Population is small in number and thinly distributed.
 - + Large land area (400ha).



2. National Plan for Introduction of the First NPP

Implementation of the first nuclear power project

- In order to manage and to coordinate all activities directly related to implement the first nuclear power project such as sites investigation and preparation, feasibility study, project management... In 2007, the Nuclear Power and Renewable Energy Projects Pre-Investment Board – NRPB (EVN) has been established.
- All above-mentioned activities should be implemented in Master Action Plan, Project No6: “Setting up a long-term nuclear power program and implementing the plan for construction the first nuclear power plant”.

2. National Plan for Introduction of the First NPP

Vision for future

GENERATION MIX IN	2020	2025
Generation	294 TWh	432 TWh
Peak	47,607 MW	68,440 MW
Installed Capacity	60,611 MW	85,411 MW
<i>In which:</i>		
Hydropower & PSPP	~ 17,195MW (28.4%);	21,295 (24.9%)
Oil & Gas	~ 16,151MW (26.6%);	16,901 (19.8%)
Coal thermal	~ 18,350MW (30.3%);	35,750 (41.9%)
Renewable	~ 1,717MW (2.8%);	2,267 (2.7%)
Import	~ 5,198MW (8.6%)	5,198 (6.1%)
Nuclear	~ 2,000MW (3.3%)	4,000 (4.7%)
	VAEC-DHN	

2. National Plan for Introduction of the First NPP

Vision for future

Generation mix in 2030

Generation 567 TWh

Peak 87,800 MW

Installed Capacity 106,600 MW

In which: Hydropower & PSPP ~ 22,200MW (20.8%);

Oil & Gas ~ 17,800MW (16.7%);

Coal thermal ~ 48,700MW (45.7%);

Renewable ~ 4,500MW (4.2%);

Import ~ 5,400MW (5.1%)

Nuclear ~ 8,000MW (7.5%)

3. Regulatory Framework for Nuclear Energy

National legal framework

Atomic energy Law

**Ordinance on Radiation
Safety and Control**

Decree 50/1998/ND-CP
on Implementation of
Ordinance on Radiation
Safety and Control

Decree 51/2006/ND-CP on
Punishment of violation of
Ordinance on Rad. Safety
and Control

**Circular on
Inspection &
Enforcement
5/2006**

**Circular on
Notification,
registration
and licensing
1/2006**

**Circular on
Rad.Waste
Management**

**Circular on
fees and
Fares**

**Circular on
Safe
Transport
of
Rad.Material**

**Circular on
radiation safety
in medical
practices 1999**

Decisions on issuance of rules , codes of practices & standards on:

- Radiotherapy Radiodiagnostic Nuclear medicine
- Industrial radiographer, Industry, Research
- Transport of Nuclear Materials; Dosimetry ...

**Security of
Rad. Sources**

3. Regulatory Framework for Nuclear Energy

National legal framework

The existing highest legal document in the field of atomic energy is Ordinance on Radiation Safety and Control, which was promulgated in 1996. Most of the existing regulation are only concern on radiation activities. There for,

In December 2002 National Assembly adopted Resolution No 12/2002/QH XI on Construction Program of law, ordinance for a tenure of XI (2002 - 2007), including Atomic Energy Law

In March 2003, Primer Minister has appointed MOST to formulate Atomic Energy Law, base on National Assembly's resolution. Drafting committee/working group also has been established by MOST in **June 2003**. The drafting committee composed with the legal and technical experts from:

- Legal Department of MOST,
- The Agency for Radiation and Nuclear Safety and Control (VARANSAC) and
- The Vietnam Atomic Energy Commission (VAEC).

3. Regulatory Framework for Nuclear Energy

National legal framework

During the time of drafting of the Atomic Energy Law, we have:

1. Studying related laws of Vietnam, IAEA and other countries (2003-2004);
2. Formulation the structure of a Draft and Draft in detail (2004);
3. Co-operating with IAEA, Japan, Korea, France to organizes seminar to get experience on nuclear legislation (2005-2007);
4. Correcting and amending the Draft after receiving the comments from experts (2004-2007).
5. The basis of compilation of the our draft Law is IAEA's Handbook on Nuclear Law, IAEA's Model Law Text and related Laws from Japan, Korea, France, Russia, Indonesia...

3. Regulatory Framework for Nuclear Energy

National legal framework

In November 2007, the draft version of Vietnam Atomic Energy Law has been completed and submitted to N.A for consideration and comments.

- **7 – 8 November 2007**: NA held a discussion on draft Atomic Energy Law and give the comments. We are again correcting and amending our Draft.

- **In 3rd June 2008**, the Vietnam Atomic Energy Law has been approved by N.A.

The Law includes 11 chapters with 93 Articles:

- Chapter I. General provisions (12 articles)
- Chapter II. The measures to promote development of atomic energy applications (5 articles)

3. Regulatory Framework for Nuclear Energy

National legal framework

The Law includes 11 chapters with 93 Articles:

- Chapter III. Nuclear and radiation safety and security of radioactive source, nuclear material and nuclear equipment (15 articles)
- Chapter IV. Radiation facilities (3 articles)
- Chapter V. Nuclear facilities (21 articles)
- Chapter VI. Survey, exploitation, processing for radioactive ores (2 articles)
- Chapter VII. Transport and import, export of radioactive material, nuclear equipment (8 articles)
- Chapter VIII. Service supporting atomic energy applications (4 articles)

3. Regulatory Framework for Nuclear Energy

National legal framework

- Chapter IX. Notification and licensing (10 articles)
- Chapter X. Emergency preparedness and response and nuclear liability (10 articles)
- Chapter XI. Executive provisions (2 articles)

For completion all legal framework including the regulations and standards, we will implement it in the Master Action Plan, Project No21: “The formulation and completion legal system and normative documents”.

3. Regulatory Framework for Nuclear Energy

National regulatory body

In accordance with the Government Decree No. 54/2003/ND-CP in May 2003, the MOST is National Regulatory Body for radiation protection and nuclear safety.

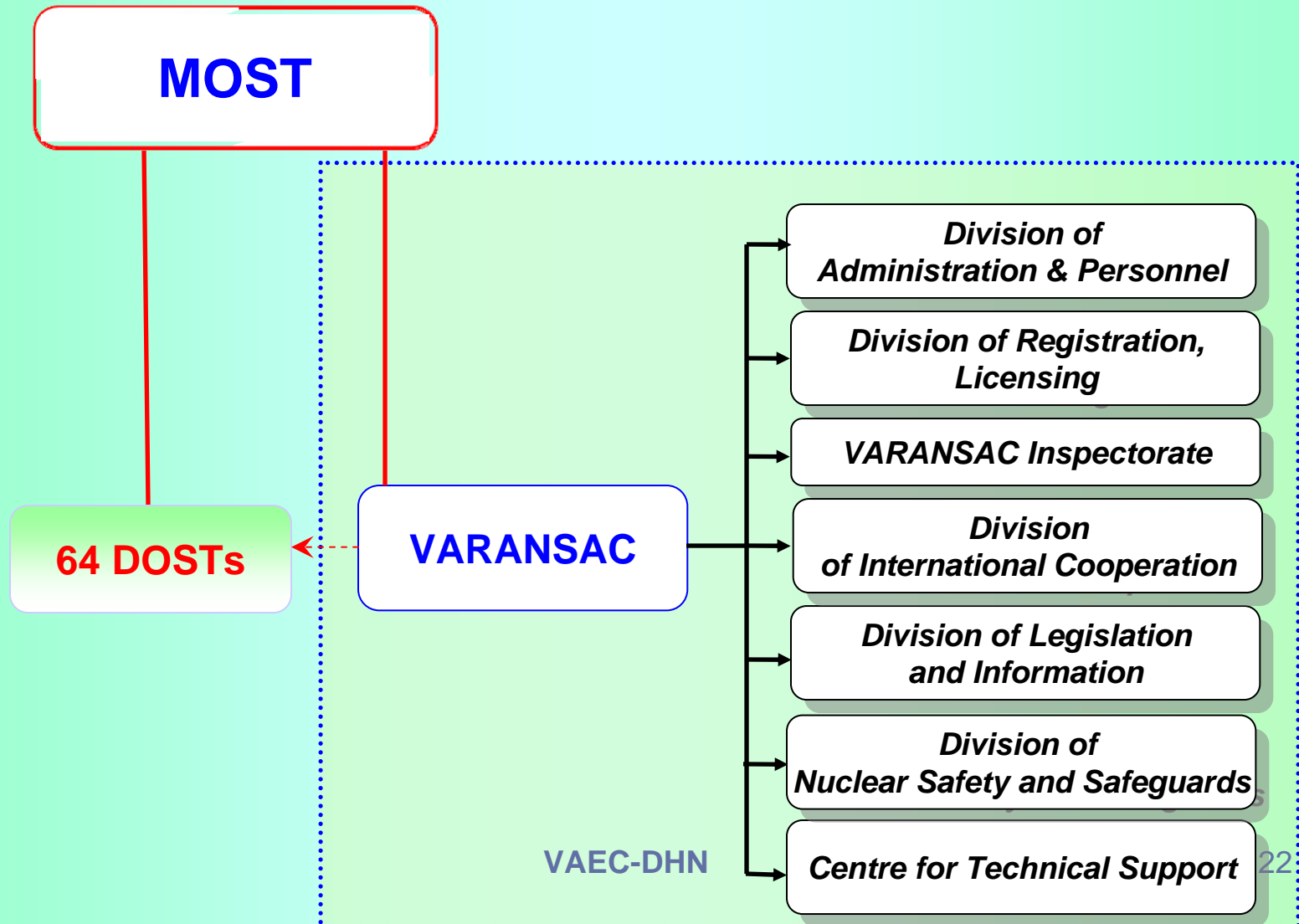
Under the MOST, there are two agencies:

1. The Viet Nam Atomic Energy Commission (VAEC) was established in April 1976 and up to April 1994 it was controlled under the Prime Minister's office. In April 1994, VAEC was reorganized and put under MOST. VAEC is responsible for nuclear policy and R&D activities.
2. In 2003, the new organization (base on VRPA) was established, namely Agency for Radiation and Nuclear Safety and Control (VARANSAC). VARANSAC is responsible for radiation protection and nuclear safety.

The 64 Provincial Departments of Science & Technology (**DOSTs**) are responsible for radiation protection and nuclear safety within the province under supervision by **VARANSAC**.

3. Regulatory Framework for Nuclear Energy

Organization of the Regulatory Body



3. Regulatory Framework for Nuclear Energy

National regulatory body

- The VARANSAC is still under-staffed and has very limited sources and lack of relevant nuclear safety expertise.
- For further strengthening capability of the regulatory body, we will implement it in the Master Action Plan, Project No23: “Perfecting and strengthening the state regulatory body on radiation protection and nuclear safety and control”.

4. Policy for Nonproliferation

General policy

The VN Government has clear and consistent policy for peaceful use of the atomic energy. This policy has been expressed in many high level legal Governmental documents, including Strategy for Peaceful Utilization of Atomic Energy up to the year 2020 approved by Prime Minister in January 2006 and Atomic Energy Law approved by National Assembly in June 2008.

Nowadays, Vietnam is a signatory member to following agreements:

1. NPT-Non Proliferation Treaty, signed in 1982.
2. Comprehensive Safeguards Agreement (INFCIRC/153), signed in 1989.
3. Additional Protocol pursuant to INFCIRC/540, signed on 10 August 2007.

4. Policy for Nonproliferation

General policy

4. Convention on Early Notification of a Nuclear Accident, signed in 1986.
5. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, (INFCIRC/336), signed in 1987.
6. Treaty on South East Asia Nuclear Weapons Free Zone, (SEANWFZ), signed on 12/1995.
7. Comprehensive Nuclear Test Ban Treaty (CTBT), signed in 1996 and ratified in 2006.

4. Policy for Nonproliferation

General policy

We are studying for signing the some more conventions such as:

- Convention on Nuclear Safety (INFCIRC/449).
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the 'Joint Convention'), reproduced in document INFCIRC/546.
- Convention on the Physical Protection of Nuclear Material (INFCIR/274).

....

For completion all necessary international legal framework, we will implement it in the Master Action Plan, Project No14: “Elaborating a plan for participating in international treaties and conventions relating to atomic energy, ensuring the international legal framework for the development of nuclear power in Vietnam”.

4. Policy for Nonproliferation

Safeguards

- Vietnam is non-nuclear weapon State and is party to the NPT;
- We have established already the State's System of Accounting for and Control of nuclear material (SSAC), before it's in charge by VAEC, now move this function to VARANSAC.
- Every year we in cooperation with IAEA to make accounting for and control of nuclear material in Dalat RR and other facility;
- And IAEA can do independently verify the completeness and correctness of the State's declaration, which has been reported in accordance with its safeguards agreement.

5. Plans for the Development of Human Resources

Education and Training Policy

- National nuclear development policy recognizes human resources development as an essential part of the required subject matter;
- It is highly emphasized as one of the first priority in the National Atomic Energy Strategy, so in the Master action plan, there are 2 projects related to Education and Training: 1 for nuclear power and 1 for non-power application.
- The present number and quality of staff do not meet the future demand
- Vietnam has developed a national strategy for human resource (3 phases):
 - Strengthening and retraining for existing manpower
 - Training for the 1st NPP (project oriented phase)
 - Training for the long term nuclear program

5. Plans for the Development of Human Resources

Education and Training Policy

- Last several years, the VAEC and EVN have closely cooperated in conduction of the pre-feasibility study and the HRD requirements for the first NPP in Vietnam.
- The EVN focused its preparation on the HRD sub-program for the first NPP project (project management, procurement, construction, operation, maintenance);
- The VAEC focused on the HRD sub-program for development of nuclear program, including nuclear experts for Promotional & Technical Support Organization (VAEC); Regulatory Body (VARANSAC); Universities.
- These tasks have been completed and submitted to the Government together with Pre-FS reports .

5. Plans for the Development of Human Resources

Education and Training Policy

For future human resources development program, we will implement it in the Master Action Plan, Project No7: “Setting up and implementing the plan for human resource development for the nuclear power development program”. The Ministry of Education and Training is responsible for the whole National Nuclear HRD Program in cooperation with MOST and MIT.

The implementation of national Nuclear HRD program will include the following tasks:

1. Upgrading nuclear faculties in universities in the country including the curriculum, teaching materials, lecturers and facilities;
2. Establishment of the nuclear training center at the VAEC to conduct short/long-term training, post-graduate education on nuclear engineering;

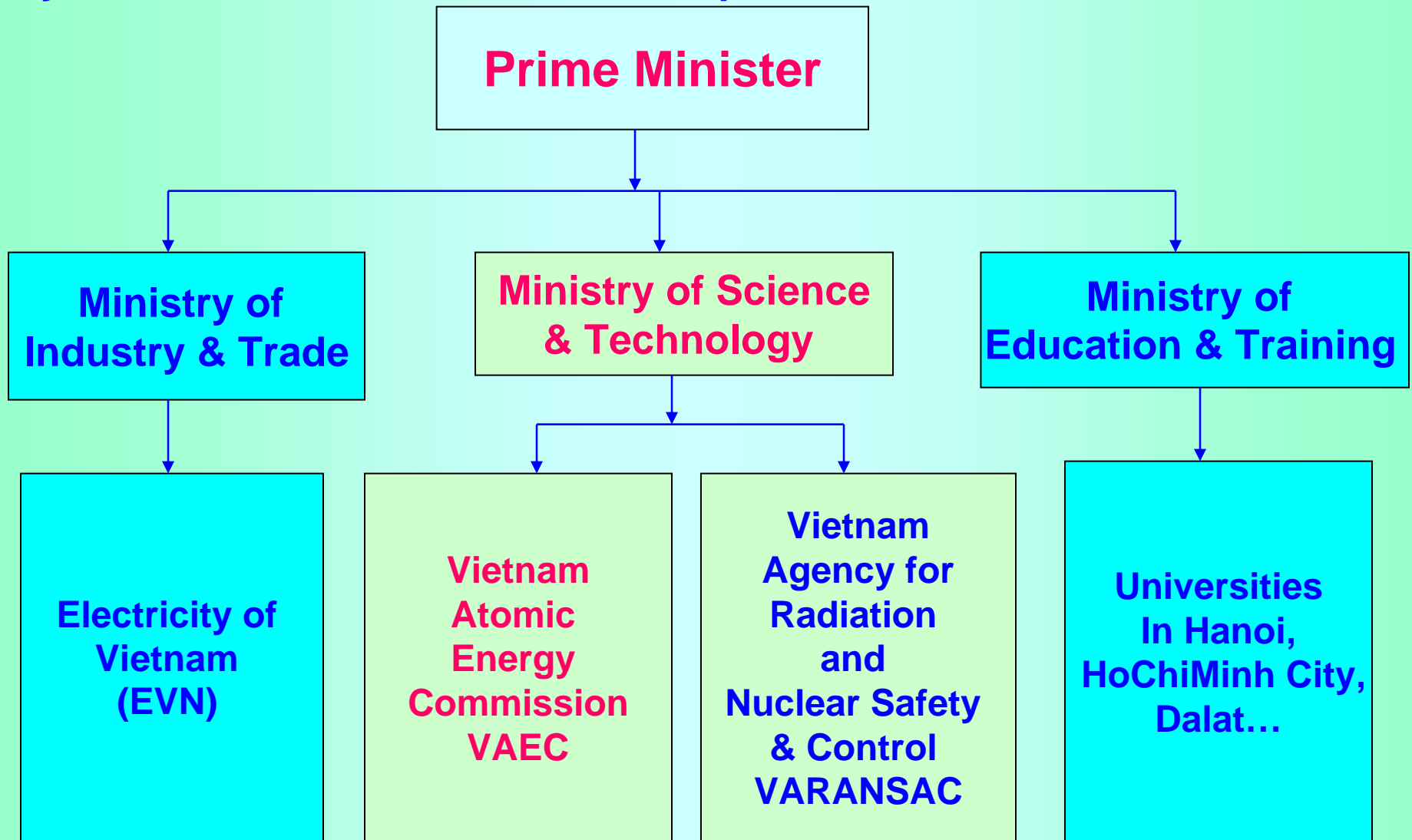
5. Plans for the Development of Human Resources

Education and Training Policy

3. Using the Governmental funds (including a so called the 132 project, a new established project conducted by the MOST) and assistances from foreign countries to send young scientists to study overseas.
4. Invite foreign experts to Vietnam to train our young scientists on nuclear engineering and nuclear safety.
5. Cooperation in the framework of existing networks and organizations, such as ANSN, ANTEP, ANENT, WNU, and so on for the purpose of nuclear education and training.

5. Plans for the Development of Human Resources

System for human resources development



5. Plans for the Development of Human Resources

Activities on E&T in last years

1. Short and Long-Term Oversea Training Program for scientists/engineers via Japan, Korea, France, India and IAEA.
2. Two Basic Training Course on NP Technology held in Hanoi University of Technology for 50 young scientists/managers (2006, 2007 by Toshiba, HUT and VAEC).
3. Nuclear Safety Seminars in 3 Universities of Vietnam (Japan -NSRA, Korea and VAEC) annually.
4. The 1st and 2nd Nuclear Engineering Courses (both in Vietnam and in Japan) for 5 month for 60 EVN engineers (2005, 2007 conducted by VAEC, EVN and JAIF/JETRO of Japan).
5. Establishment of the 9-month Training Course for the VAEC new staffs (graduates, post-graduates scientists and engineers) from September 2007.

5. Plans for the Development of Human Resources

Activities on E&T in last years



Opening and Awarding Ceremony of Training Course on NPP Technology, at Hanoi Univ. of Technology, 12 Nov. 2007

5. Plans for the Development of Human Resources

Activities on E&T in last years



Opening the 1st 9-month Training Course for the VAEC
New Staffs, 25 September 2007.

6. CONCLUSION

- Atomic energy utilization has been contributing to the socio-economic development in Vietnam.
- Nuclear power development is an effective and beneficial solution to meet increasing electricity demand in Vietnam.
- Vietnam Government has made a strong commitment on development and peaceful use of atomic energy in the future.

We recognize that:

- The introduction of nuclear power into country is a difficult procedure requiring great manpower, high infrastructure level, large financial resource and strong national effort.
- Therefore, regional and international cooperation play an very important role for our nuclear power development program.

**Thank you
for
your attention!**