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National Plan for the Introduction of Nuclear Energy and the Regulatory Framework and Nuclear Nonproliferation Commitments

Presented by
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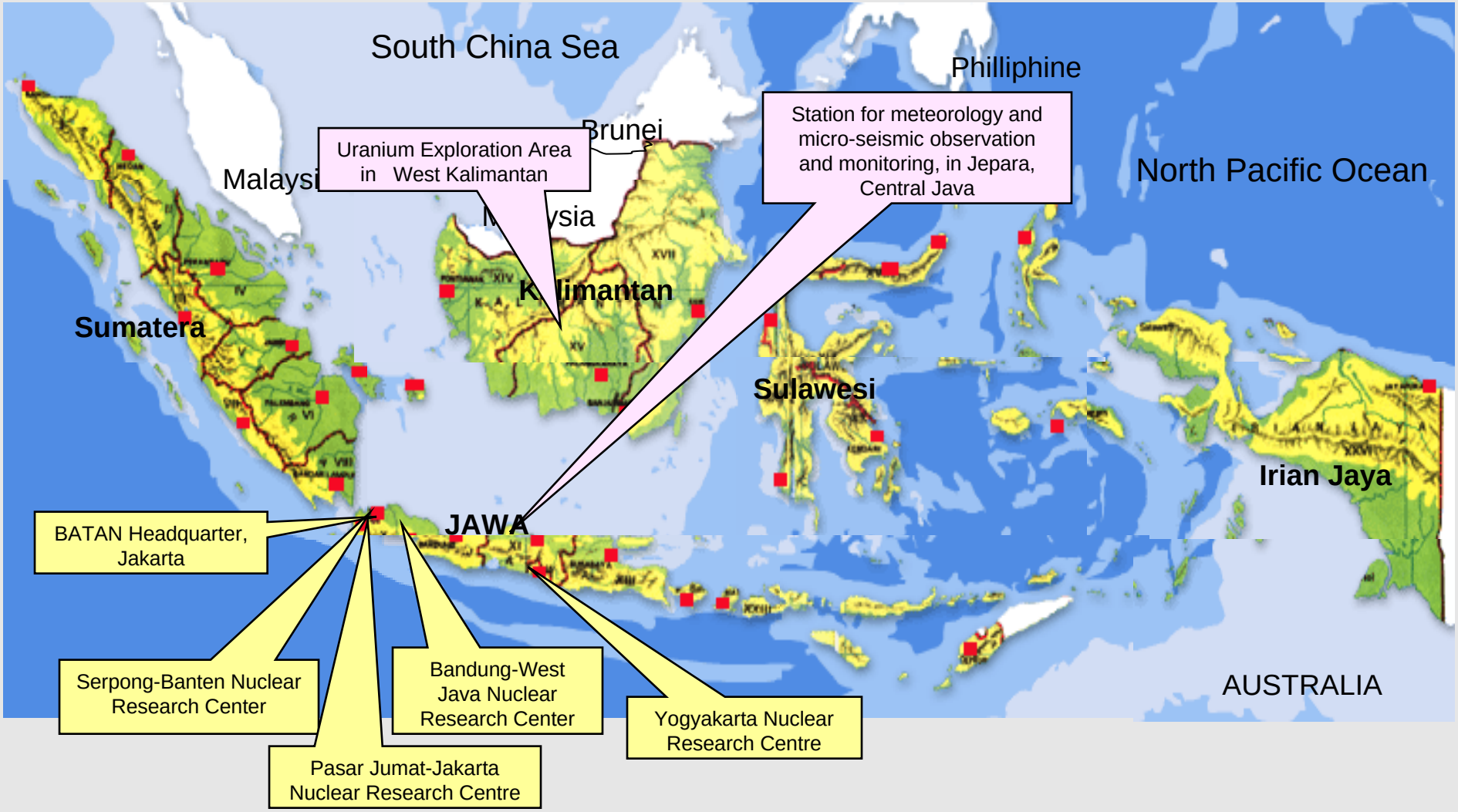
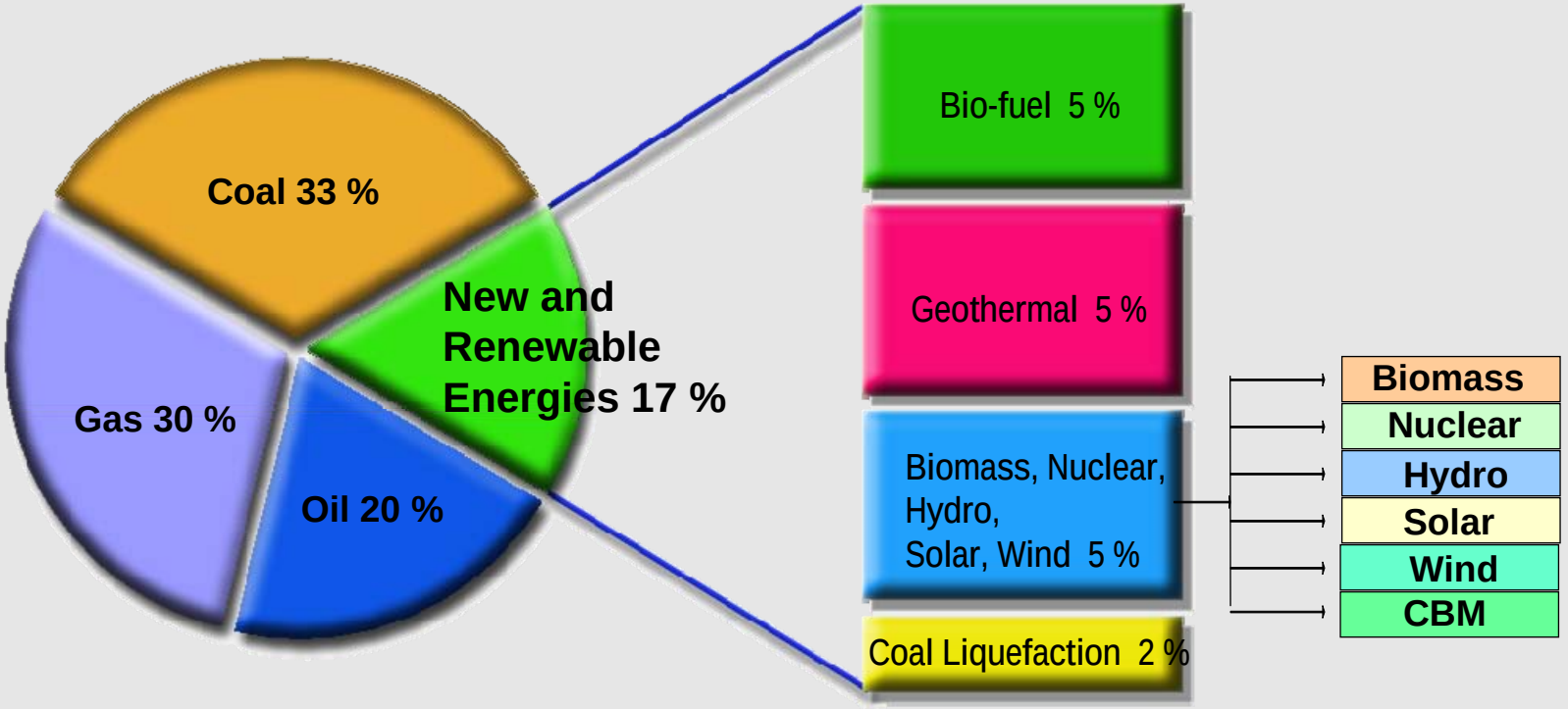
BATAN'S FACILITIES



- National Plan for the Introduction of the First Nuclear Power Plant

NATIONAL ENERGI MIX Year 2025
(Presidential Regulation No. 5 / 2006)



THE ROLE OF NPP

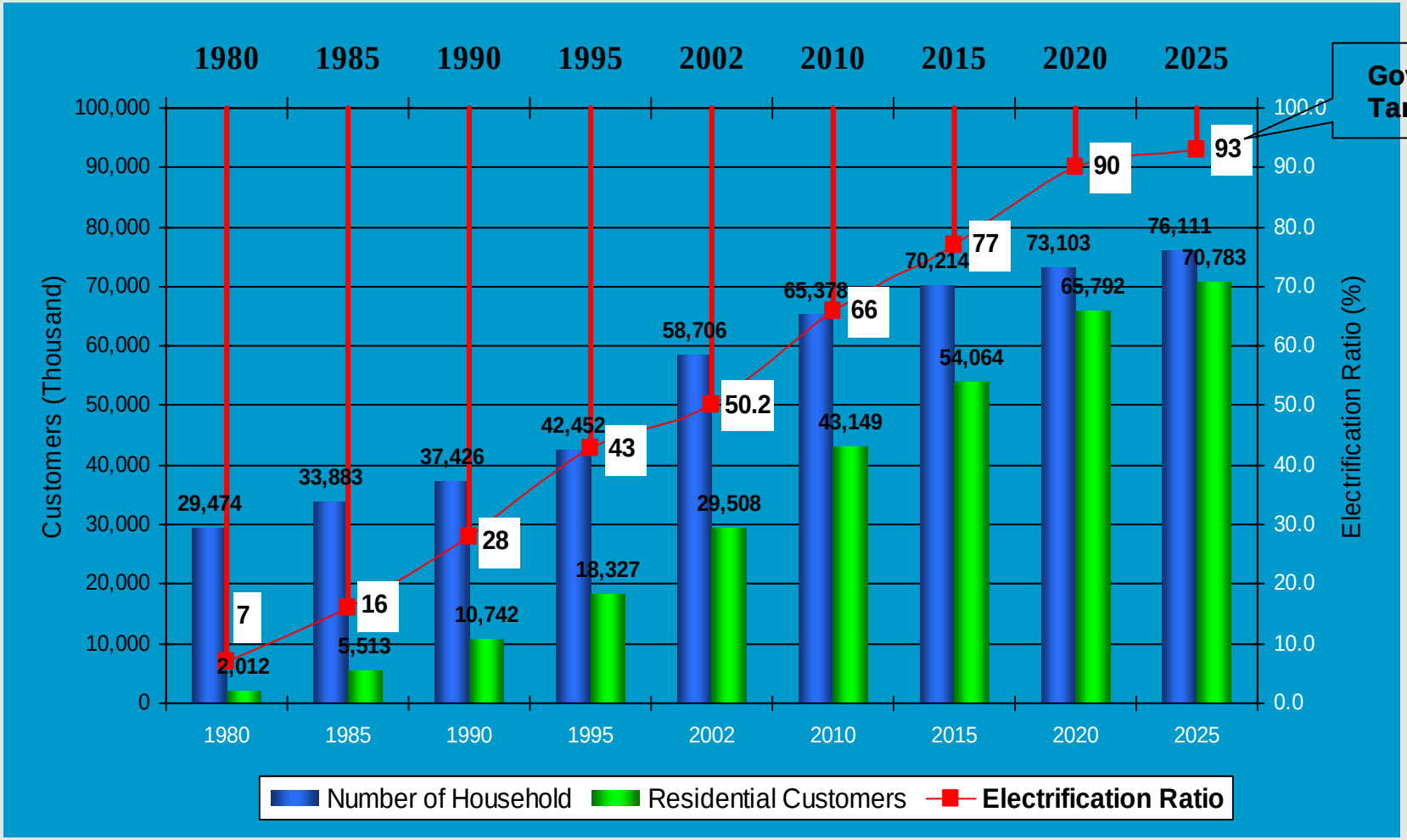
2 % of Primary Energy or
4 % of National Electricity

NATIONAL ELECTRICITY PLANNING
2005 - 2025

LONG TERM PROGRAM 2025

- Electrification Ratio 93%
- Electricity demand 445 TWh
- Transmission networks extension in Sumatera, Kalimantan and Sulawesi Islands
- Establishment of NPP in around 2017.

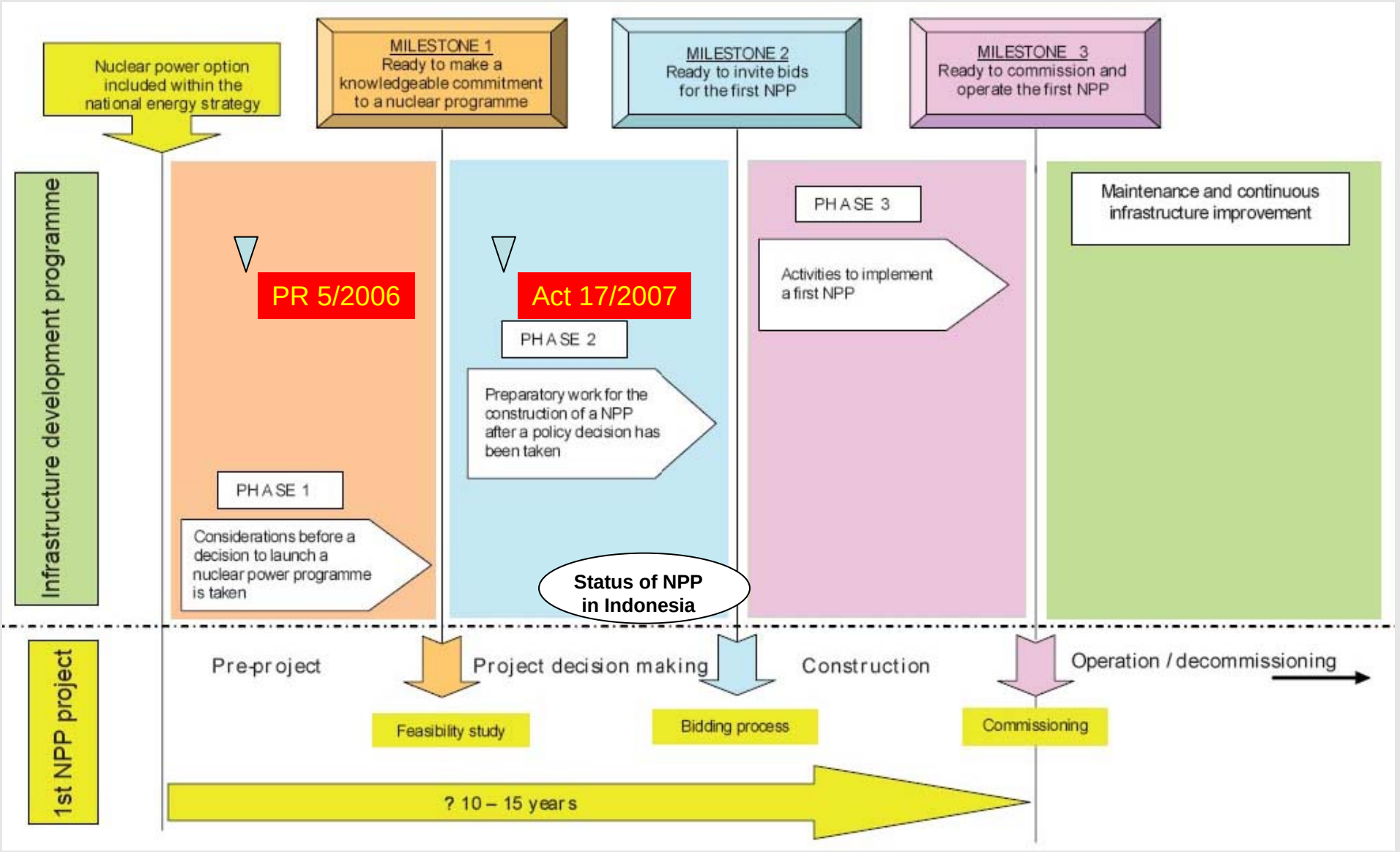
ELECTRIFICATION



NATIONAL NUCLEAR ENERGY AGENCY

Source : DGEEU-MEMR

INFRASTRUCTURE DEVELOPMENT PROGRAM



Source r: IAEA NG-G-3.1, 2007

STATUS OF BASIC NUCLEAR POWER INFRASTRUCTURE

NO.	INFRASTRUCTURE ISSUES	STATUS
1.	National Team for NPP Development Planning	Under process
2.	Nuclear Power Policy	Under preparation
3.	Act on Nuclear Energy	Act No. 10/1997 on Nuclear Energy
4.	Nuclear Regulatory Body	Bapeten
5.	Educational Institutions	STTN, Pusdiklat Batan, Cooperation between Batan and National or Foreign Educational Institutions
6.	Economic Assessment	Need to be updated
7.	Fnancial Assessment	Need to be updated
8.	Public Information	It should be carried out continuously.
9.	Siting and Site Infratructure	3 potential sites have been selected, updating site data
10.	Grid Strengthening	Grid is available
11.	Transportation Means	Need to be improved
12.	Eviromental Assessment	Need to be updated
13.	Bid Request, Evaluation & Vendor Selection	Based on Project Schedule.
14.	Licensing	Under Preparation
15.	Emergency Planning	To be Prepared
16.	National Laboratories	NSTB Batan at Puspitek Serpong, 2010
17.	Engineering	Need to be Developed
18.	Project Management & Commissioning	Based on Project Schedule
19.	Fuel Supply	Based on Project Schedule and Batan
20.	Waste Management	Based on Project Schedule, Operator and Batan.

Note:

Existing, In Function Based on Project Schedule Under Process / Preparation, Need to be updated / improved / developed

CURRENT INFLUENCING FACTORS.

Current influencing factors of nuclear power plant introduction are as follows:

(1) Public acceptance

Program of Socialization – Public Education & Information.
Program of Social Engineering – Community Development.

(2) Financing scheme.

The financing schemes should achieve two objectives: *minimal costs to the government and affordable electricity price*.

Based on IAEA TECDOC 1513 the possible methods of financing Nuclear Power Plant:

- *Projects Fully Financed by Government Owned Utility.*
- *Projects Fully Financed by Private Sector Utility.*
- *Project Financed by Project Financing Model*

NPP(LWR TYPE) ESTABLISHMENT SCENARIO

No	Starting of construction	Starting of operation	U enrichment (ton U) need for loading I	U enrichment (ton U) need for reloading
1	2010	2016	74.1	24.7
2	2011	2017	74.1	24.7
3	2018	2023	74.1	24.7
4	2019	2024	74.1	24.7

- Regulatory Framework for Nuclear Energy

NATIONAL LEGAL INSTRUMENTS RELATING TO NPP DEVELOPMENT IN INDONESIA

- Act No. 10 Year 1997 on Nuclear Energy
- Act No. 17 Year 2007 on National Long-Term Development Planning 2005-2025.
- Act No. 30 Year 2007 on Energy
- Presidential Decree No. 103, 2001 on BATAN & BAPETEN Tasks, Function, and Responsibility jo President Decree No. 64, 2005
- Presidential Decree No. 7 Year 2005 on National Medium-term Development Planning 2004–2009
- Presidential Regulation No 5 Year 2006 on National Energy Policy .
- National Electricity General Planning (RUKN) 2006-2026, MOEMR 2006.
- Guidance for the Application and Development of Sustainable Nuclear Energy System in Indonesia
- Presidential Decree No 43 Year 2006 on Licensing of Nuclear Reactor

GUIDANCE OF THE APPLICATION & DEVELOPMENT OF NUCLEAR ENERGY SYSTEM (NES) IN INDONESIA

Nuclear Energy System (NES) comprises the complete spectrum of nuclear facilities and associated institutional measures.

The primary purpose of the Document is to provide a guidance of the application and development of Nuclear Energy System (NES) as a part of energy supply security for supporting sustainable development. This guidance provides a set of **basic principles** and **requirements** in the subject areas of **economics, environment, safety, waste management, proliferation resistance, and infrastructure**. The anticipated uses of the document are as the following:

1) Establish a regulatory basis for NES including the regulatory body's agreement on licensing issues and severe accident issues, which provides high assurance of license;
2) Provide a set of design requirements for a standardized plant which are reflected in NES and plant supplier certification design; and
3) Provide a set of technical requirements which are suitable for use in a NES investor bid package for eventual detailed design, licensing and construction

BASIC PRINCIPLES AND REQUIREMENT OF NUCLEAR ENERGY SYSTEM (NES)

The Basic Principles and Requirements are formulated based on the national and international norms and standards, IAEA regulation and the *best international practice on the nuclear domain* for optimizing national energy mix system to support the sustainable development :

Economics: energy and related products and services from NES shall be affordable and available and gradually promote the quality of the national industry

Safety of Nuclear Installation: implement and develop the concept of defense in depth focusing to increase the safety characteristic and feature of passive safety, so that the health and environment risks are lower than those of other energy systems.

Environment and Site Conditions: minimize the negative impact for assurance the long-term sustain, keeping the green environment, designed and operated according to the condition of site and environment.

Waste Management: minimize waste and protect human health and environment against the actual and future radioactive waste hazard without burdening the future generation.

Proliferation Resistance: intrinsic and extrinsic features are always applied optimum during lifetime of NES through design and engineering so that proliferation resistance can be achieved effectively and economically.
Infrastructure: qualified of minimum infrastructure and real-time to support the application and development of NES

POLICY OF APPLICATION AND DEVELOPMENT OF NUCLEAR ENERGY SYSTEM (NES)

- NES is applied and developed symbiotically and synergistically with renewable and non-renewable energy to sustain the energy security of national development.
- The application and development of NES are guided by the basic principal and condition of: economics, safety of nuclear installation, environment and site conditions, waste management, proliferation resistance and infrastructure.
- The application and development of NES are based on a proven evolutionary and / or innovative designs.
- The application and development of NES are supported by the government incentive particularly in the pre-project of preferred site selection.
- Site area for establishment of NES accommodates more than one nuclear reactor, nuclear installations and other systems having a preliminary site permit from BAPETEN as a part of combined operating license.

POLICY OPTION ON NFCS

No	SERVICES	DOMESTIC	INTERNATIONAL
1	Uranium Supply	■	☑
2	Conversion	■	☑
3	Enrichment		☐
4	Fabrication	☑	☑
5	Interim Storage	☑	
6	Reprocessing		☑
7	Radioactive waste management	☑	☑
8	Transportation	☑	☑

☑ Optimum Services Option

■ U mining, milling, purification and conversion **may be done domestically** whenever **economically justified**

☐ Use of Global, or Regional? NFCS Facilities

IMPLEMENTATION OF SEN

- Indonesian Guidance of Application and Development of NES is the formulation base of **UCD** (*User Consideration Document*).
- **UCD** is used to establish **BIS** (*Bid Invitation Specification*) and design documents of **EPC** (*Engineering, Procurement & Construction*)
- during the pre-project activities the guidance is important to establish a *Plant Concept.*
- during the project implementation the guidance is used in the activities of **DMCO** (Design, Manufacturing, Construction & Operation).

- Policy for Nonproliferation

THE PRINCIPLE CRITERIA OF NONPROLIFERATION POLICY

- corresponds to the Indonesian Constitution Preamble 4rd Paragraph : Indonesia promote actively world peaceful purposes, the human right, anti colonialism, national independency and people welfare
- in harmony with the IAEA system: multilateral, and integrated safeguard system consisted of comprehensive safeguard agreement and additional protocol
- non-contradictory to the NPT and non-discriminatory

SAFEGUARDS IMPLEMENTATION

- Indonesia complies with the NPT and the IAEA safeguards system consists of the Comprehensive Safeguards Agreement and the Additional Protocols. The statement of the Director General of IAEA to the forty seventh Regular Session of the IAEA General Conference, in Vienna 15 September 2003 recognized Indonesia as the first three countries (Australia and Norway) implementing CSA and AP
- in the field of safety and security, Indonesia is a party to the Convention on Nuclear Safety, the Convention on Physical Protection of Nuclear Material and Nuclear Facilities , and the Convention on Early Notification and Assistance in the Case of an Accident or Radiological Emergency.
- Indonesia has also been a full participation in the Asian Nuclear Safety Network (ANSN).

INDONESIA'S ROAD TO COMPLY WITH NPT AND INTEGRATED SAFEGUARDS

1. 1 July 1968 : NPT open for signature
2. 2 March 1970 : signing NPT
3. 12 July 1978 : ratification NPT
4. 14 July 1980 : signing CSA
5. 29 Sept. 1999 : signing & entry into force AP

AUGUST 2003

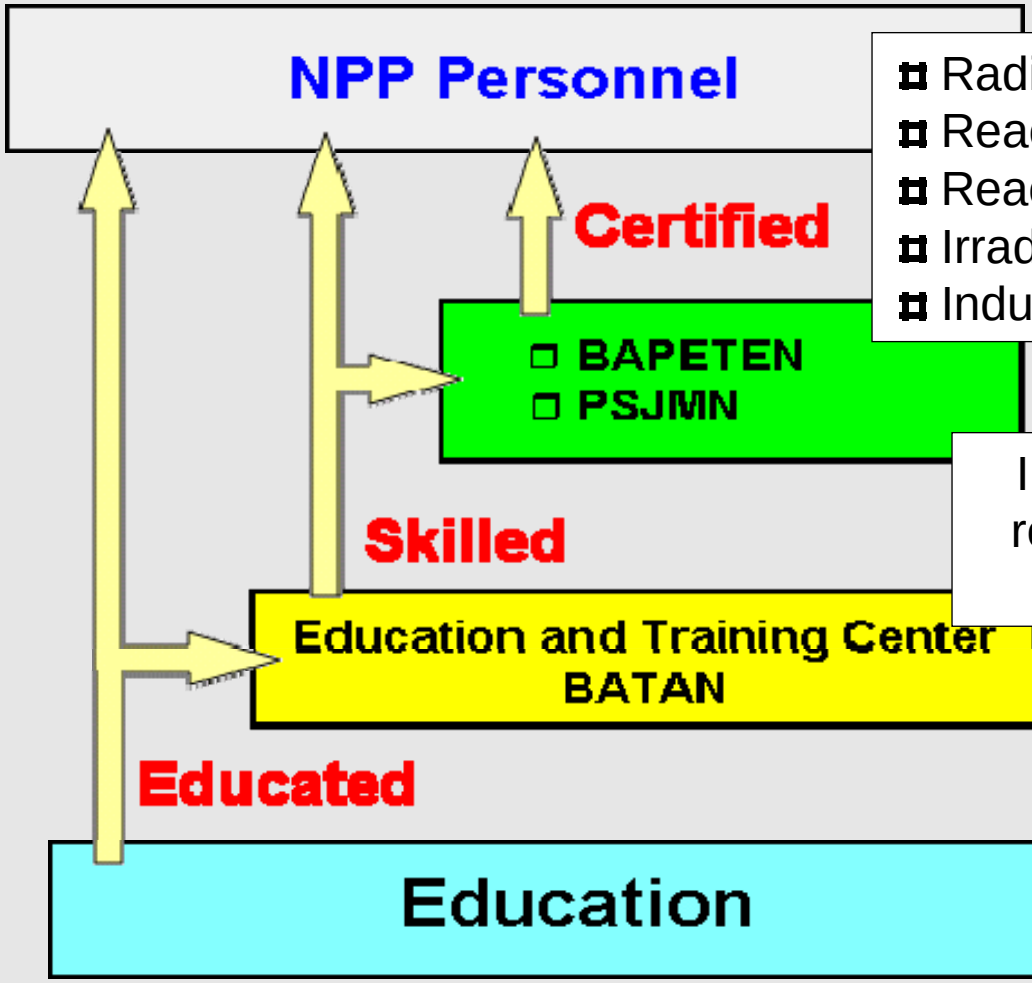
CONCLUSION OF INTEGRATED SAFEGUARDS BASED ON:

- ✧ Correctness and Completeness of Safeguards Reports and Additional Protocol Declarations
- ✧ No diversion of NM uses (only for peaceful purposes)
- ✧ No undeclared NM in the country
- ✧ No clandestine (undeclared) nuclear activities

- Plans for the Development of Human Resources

HRD TRAINING PROGRAM

- Nuclear Training Institutions

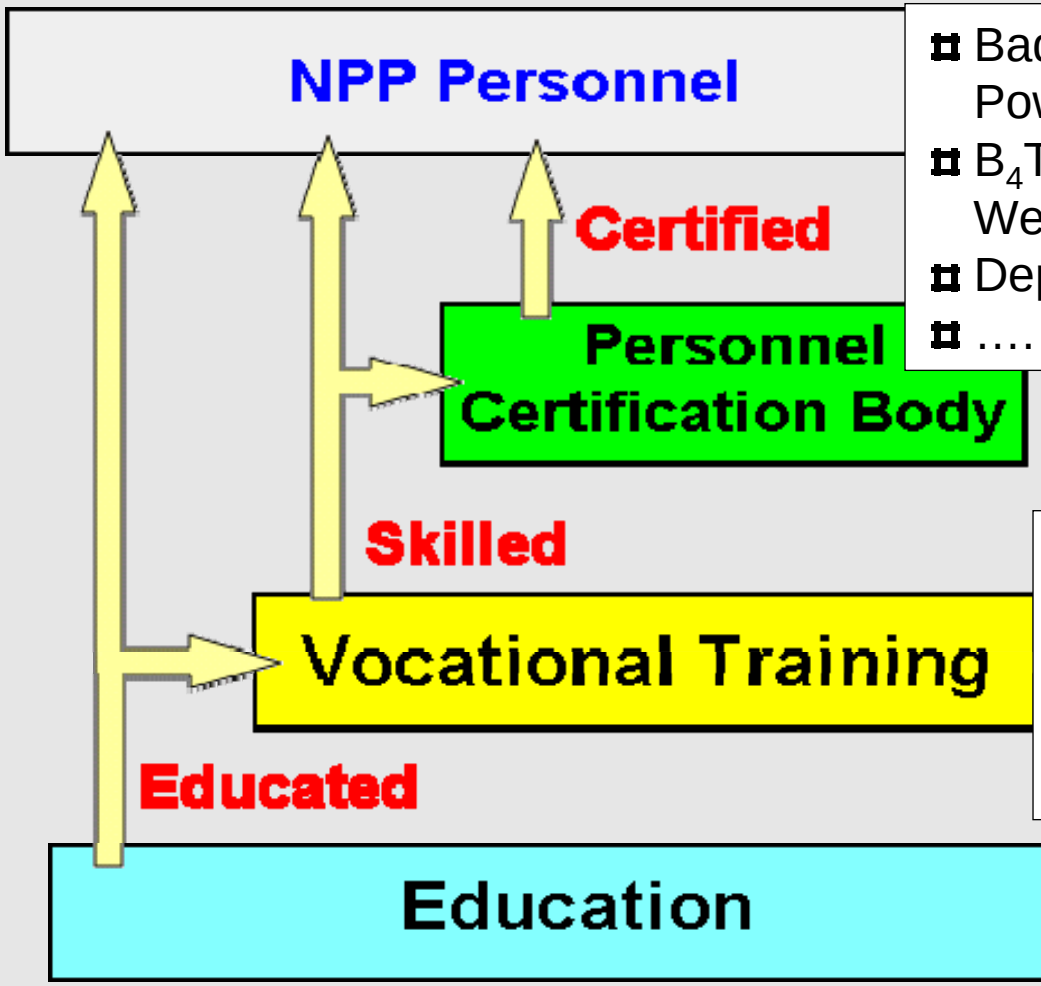


- Radiation Protection Officer
- Reactor Operator/Supervisor (RR)
- Reactor Maintenance (RR)
- Irradiator / Accelerator
- Industrial Radiography

In average 30 nuclear related training course per year

HRD TRAINING PROGRAM

- Non-nuclear Training Institutions



- Badan Diklat ESDM (Electrical Power)
- B_4T (NDT non radiography, Welding Inspector, etc)
- Depnaker (Welder, Crane)
- ….

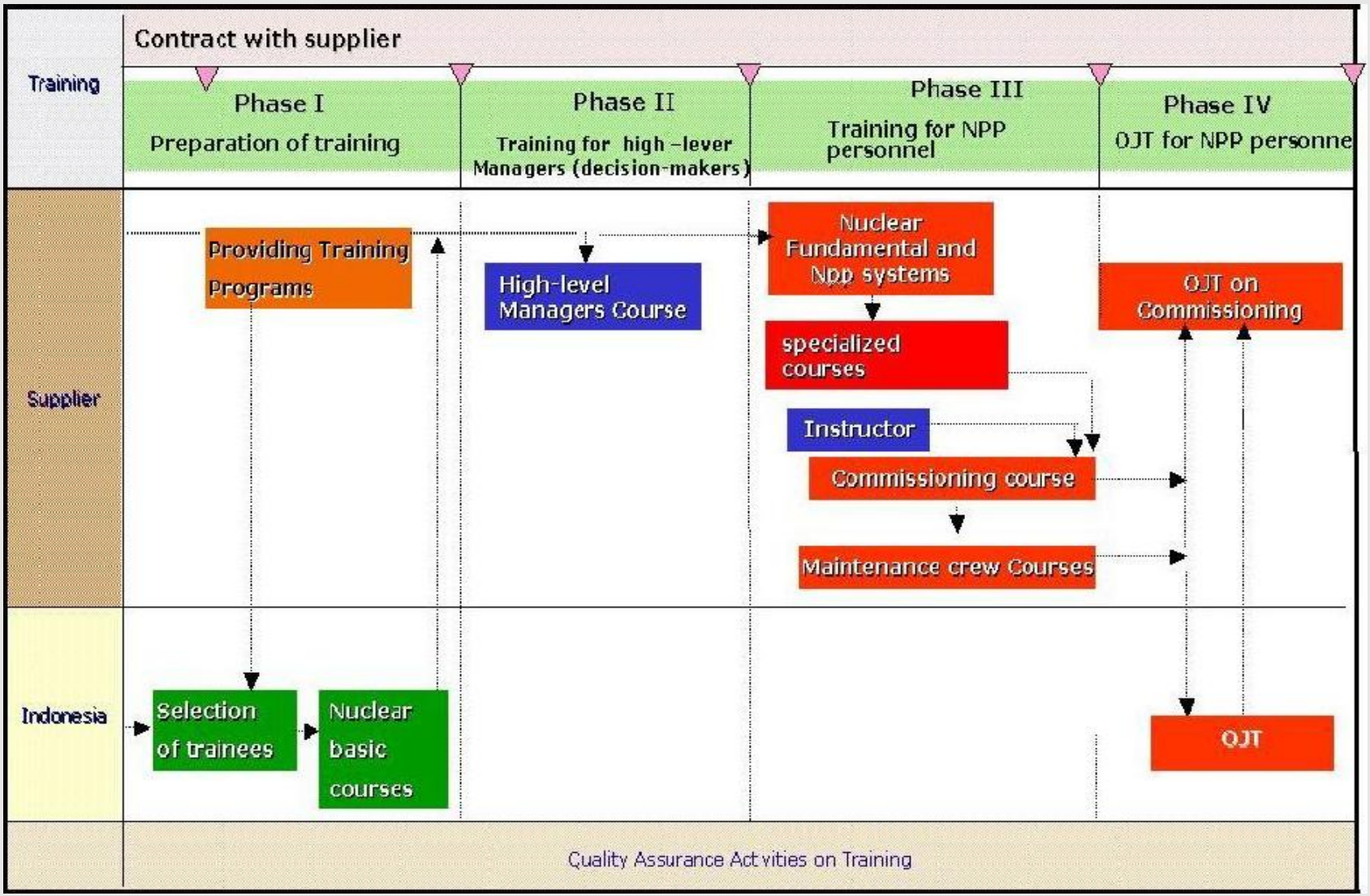
Many vocational training institutions in Indonesia:
- Under state-department
- University
- Private

HRD TRAINING PROGRAM

- Training Scheme implemented by ETC-BATAN

Basic			Level I	Level II
Introduction to The Radiation Protection	Introduction to Nuclear Engineering	Basic Profesional Training Course on Nuclear Safety	RPO in Research Reactor, Nuclear Fuel, and other Nuclear Installations	Safety Supervisor of Nuclear Installaion
			Operator of Research Reactor	Supervisor of Research Reactor
			Maintenance of Research Reactor	Maintenance Supervisor of Research Reactor
			Emergency Preparedness in Nuclear Installations	
			Other Profesional TC on nuclear safety	
	Introduction to Radiation and Isotope Application		RPO in Radiation and Isotope Application	
			Dosimetry Officer in Radiation Application	
			Operator of Radiation and Isotope Application	Supervisor of Radiation Application
			Emergency Preparedness in Radiation and Isotope Applications	
			Other Profesional TC on radiation safety	
	Not Directly Related Competency (Administrative, Quality Assurance, Informatics, instrumentation, etc.)			

EXPECTED TRAINING SYSTEM FOR NPP OPERATIONAL PERSONNEL



CONCLUSIONS

- Indonesia complies with the NPT and the IAEA integrated safeguards, and commits to nuclear nonproliferation.
- The introduction of NPP in Indonesia is not only to reach an optimal energy mix based on cost and environmental protection, but also to relieve the pressure arising from increasing domestic demand for oil and gas as well as to support sustainable development in Indonesia .
- The Presidential Decree that is required to establish the ownership of NPP and the relevant policy is being processed. While all necessary pre-project activities and those required for owner establishment are being prepared.
- Some political, economical, social and technical efforts have been done to realize the introduction of the first NPP in Indonesia. Few preparation studies, however need to be further up-dated, to conclude the objective.
- The Basic Principles and Requirements of Nuclear Energy System (NES) have been formulated based on the national and international norms and standards, IAEA regulation and the *best international practice on the nuclear domain* for optimizing national energy mix system. The primary purpose of the Document is to provide a guidance of the application and development of NES as a part of energy supply security
- In spite of the complete, comprehensive and long-time preparation that have already been carried out, main influencing factors i.e. public acceptance, and economic–financing scheme still need to be properly managed to succeed the NPP introduction in Indonesia

THANK YOU VERY MUCH