

INDONESIA'S UPDATE POLICY AND HRD PREPARATION for NPP



Bromo

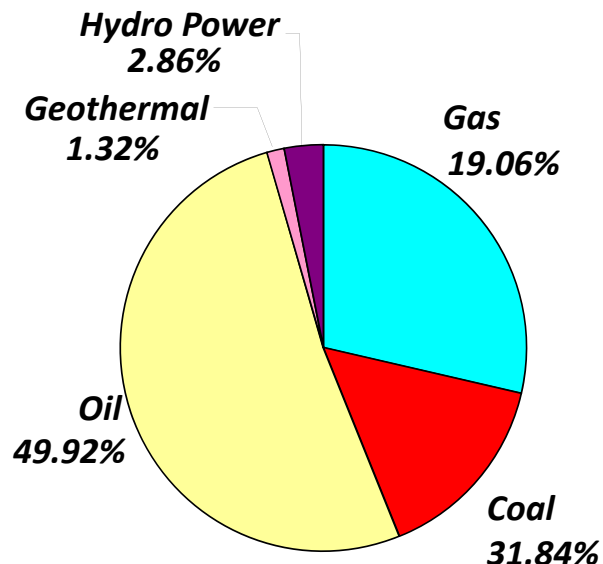
Prepared by
The National Team of HRD for NPP
INDONESIA

Indonesian Map



Indonesia's Current Energy Condition

**Primary Energy Mix 2008
(1014 Million BOE)**



Energy Elasticity = 1.63

Non Fossil Energy (NRE) < 5%

- Indonesia's **energy consumption increases at an average of 7% annually** in the last ten years;
- **Oil and gas still play an important role** in the national economy development both as the state's main source of revenue and domestic energy supply;
- **Oil still dominates** the national energy mix
- **Oil reserves are depleting**, although **gas and coal reserves are increasing**;
- **Part of energy prices are still subsidized** which burdens the state budget and interferes the development of alternative energy;
- **Electrification ratio is currently about 72% (2012)**;
- **Energy utilization is still inefficient**, or used for non-productive use with **the energy elasticity still > 1** (around 1.63 in 2008);
- **The government is committed to reduce GHG emissions up to 26% in 2020** with national efforts and **41% with international assistance**. **Renewable energy and energy efficiency programs** are currently being prioritized to achieve the emission reduction targets

NATIONAL ENERGY RESOURCES (2010)

NO	RENEWABLE ENERGY	RESOURCES (SD)	INSTALLED CAPACITY (KT)	RATIO KT/SD (%)
1	2	3	4	5 = 4/3
1	Hydro	75,670 MW	5,705.29 MW	7.54
2	Geothermal	29,038 MW	1,189 MW	4.10
3	Mini/Micro Hydro	1013.5 MW	462.0 MW	46.0
4	Biomass	49,810 MW	1,618.40 MW	3.25
5	Solar	4.80 kWh/m ² /day	13.5 MW	-
6	Wind	3 – 6 m/s	1.87 MW	-
7	Uranium	24,112 ton (Uranium) 1,500 ton (Thorium)	30 MW	1.00

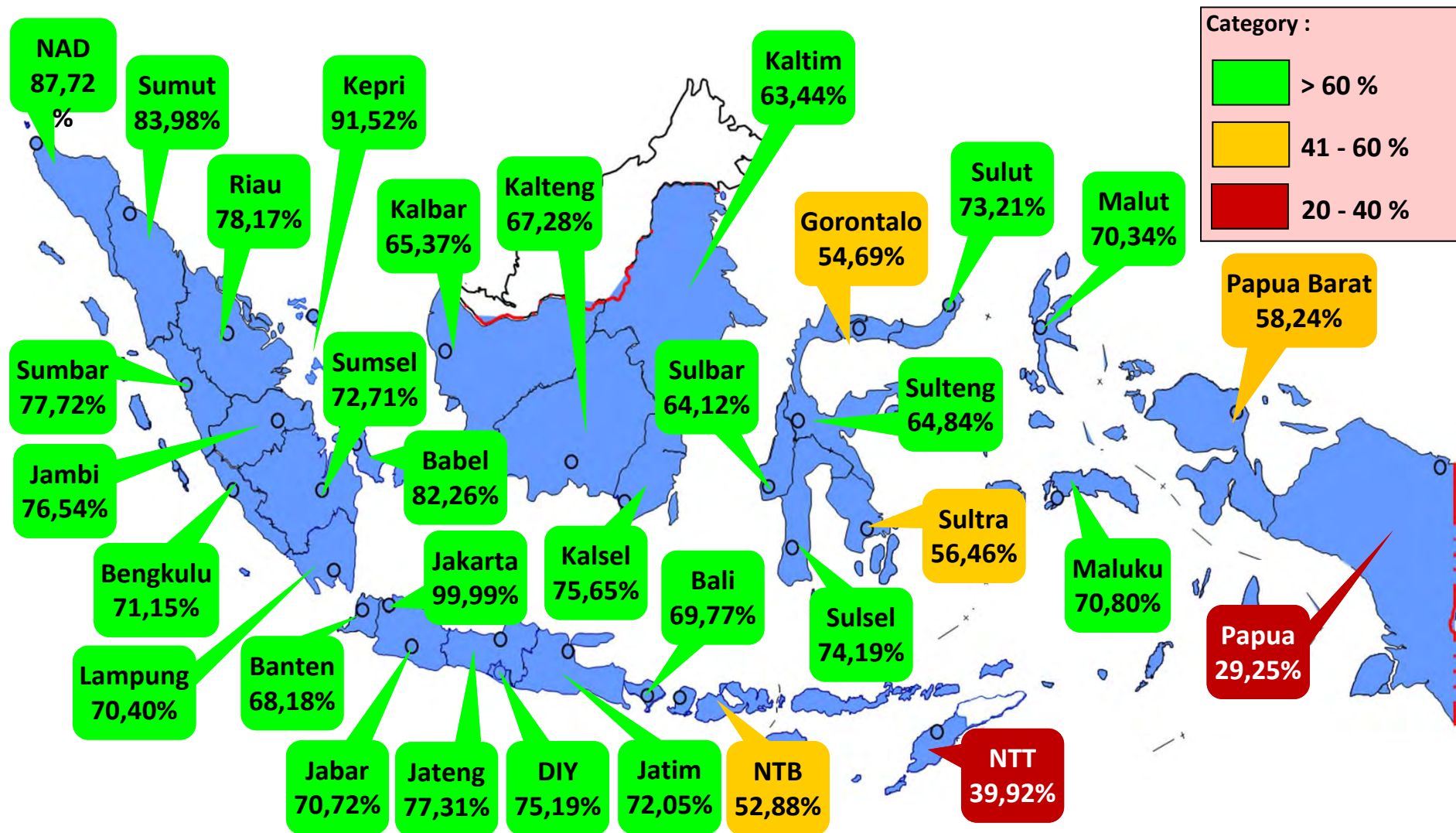
*) Only in Kalan – West Kalimantan

No	FOSSIL ENERGY	RESOURCES (SD)	RESERVES (CAD)	RATIO SD/CAD (%)	PRODUCTION (PROD)	RATIO CAD/PROD (YEAR*)
1	2	3	4	5 = 4/3	6	7 = 4/6
1	Oil (<i>bill barrel</i>)	56.6	7.99 **)	14	0.346	23
2	Gas (<i>TSCF</i>)	334.5	159.64	51	2.9	55
3	Coal(<i>bill ton</i>)	104.8	20.98	18	0.254	83
4	Coal Bed Methane/CBM(<i>TSCF</i>)	453	-	-	-	-

*) With assume that no new additional reserve

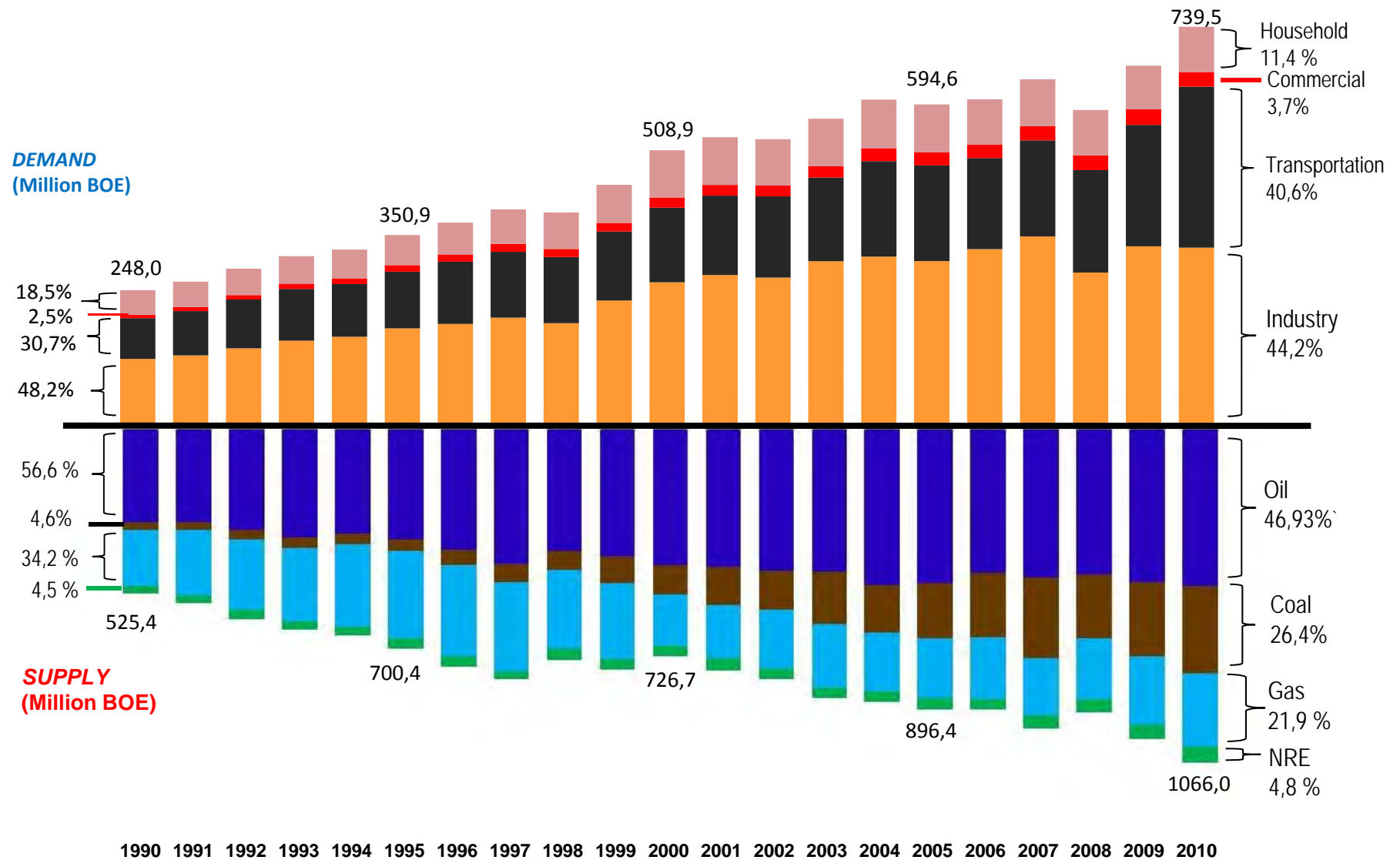
***) Including Blok Cepu

ELECTRIFICATION RATIO BY PROVINCE (2011)



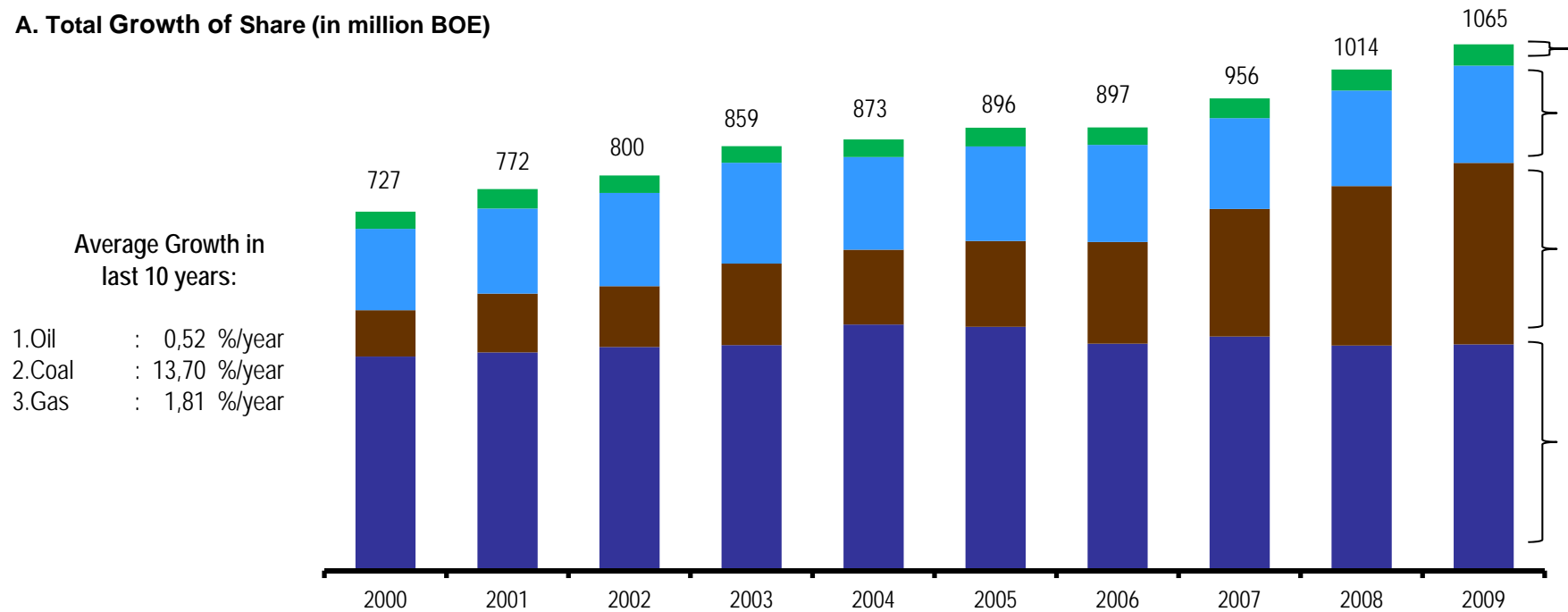
	REALIZATION (Years)						TARGET (Years)		
	2006	2007	2008	2009	2010	2011	2012	2013	2014
Rasio Elektrifikasi	63%	64,3%	65,1%	65,8%	67,2%	72,95%	75,3%	77,65%	80,0%

GROWTH OF ENERGY DEMAND AND SUPPLY 1990 - 2010



GROWTH OF FOSSIL ENERGY SHARE AND SUBSIDY 2000 – 2009

A. Total Growth of Share (in million BOE)

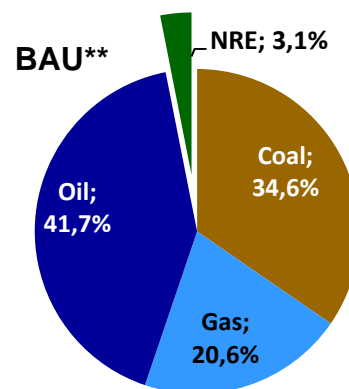
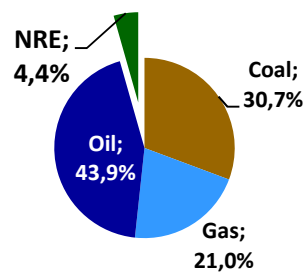


B. Growth of Fossil Energy Subsidy (in billion Rupiah)

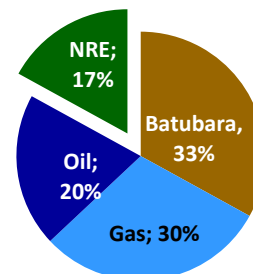
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1. Electricity Subsidy	3,93	4,30	4,10	3,36	3,31	10,65	33,90	37,48	78,58	53,72
2. Electricity Subsidy from fossil energy*)	3.30	3.55	3.49	2.92	2.86	9.20	29.75	32.63	68.16	46.14
3. Fuel Subsidy	55.64	63.26	31.75	30.04	59.18	103.35	64.21	83.79	139.03	45.04
Total Subsidy for Fossil Energy	58.94	66.81	35.24	32.96	62.04	112.55	93.96	116.42	207.19	91.18

*) Proportional with share of fossil energy in primary energy mix for electricity generation

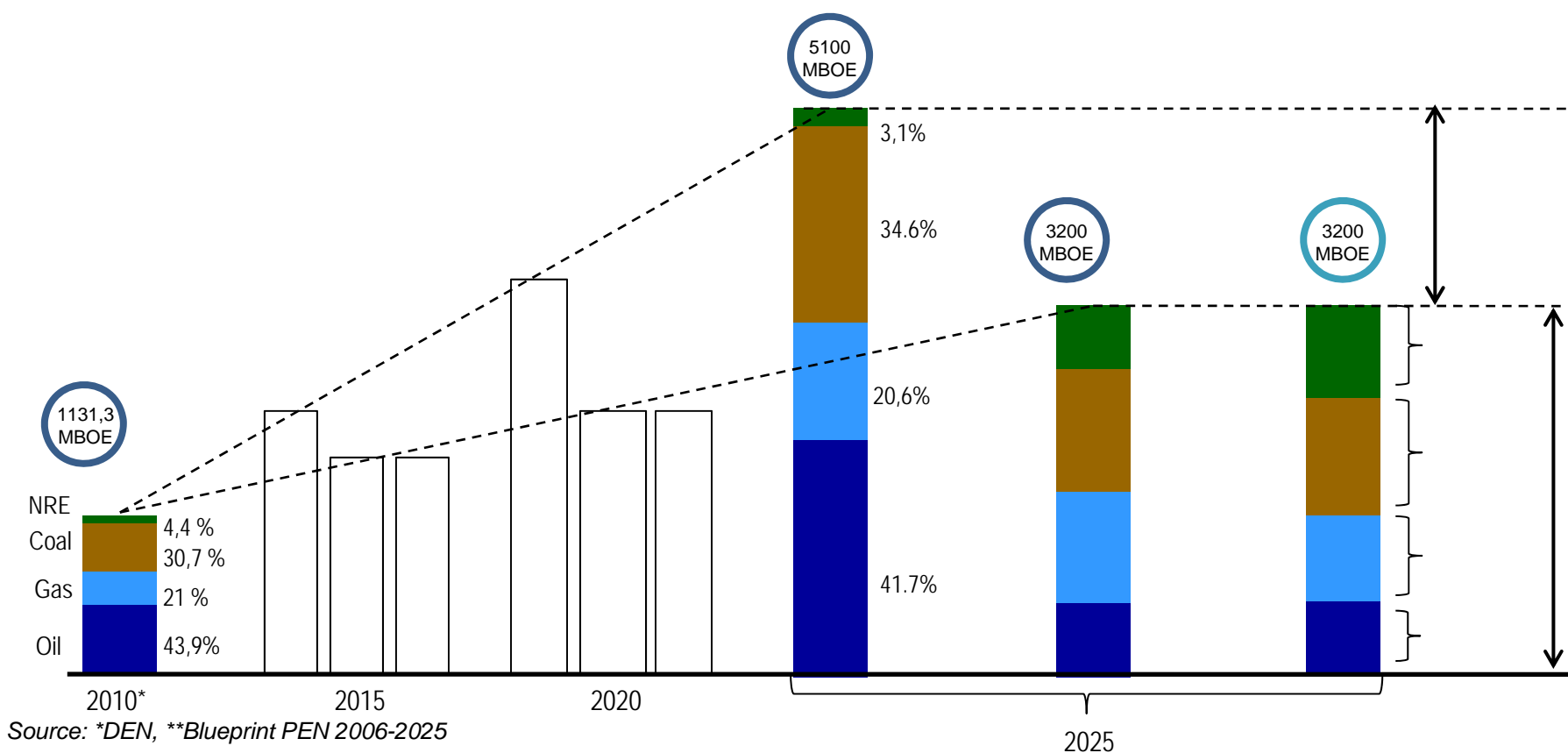
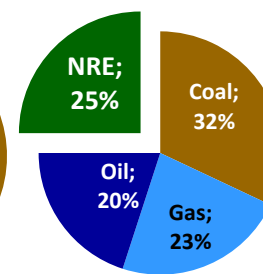
POLICY DIRECTION



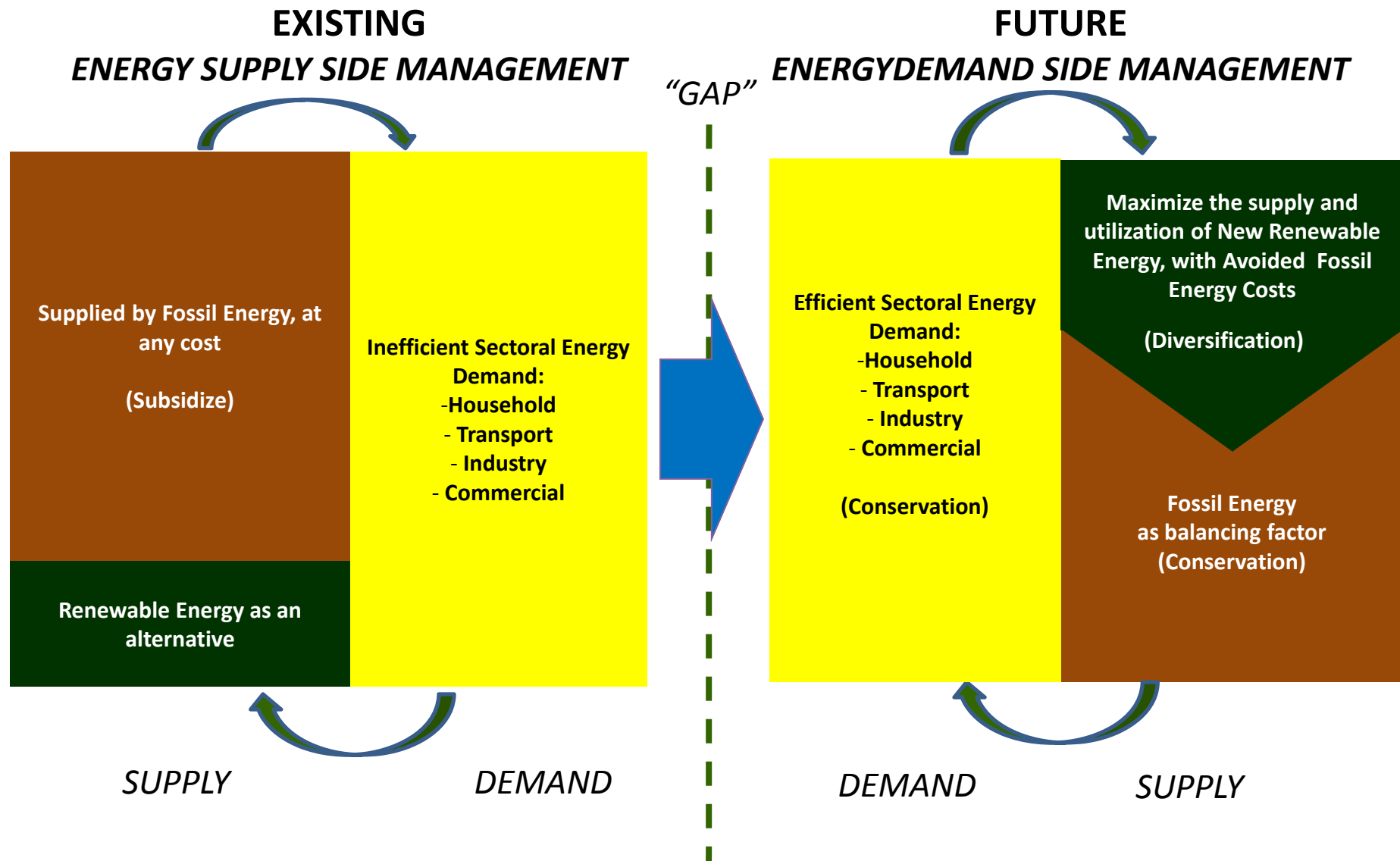
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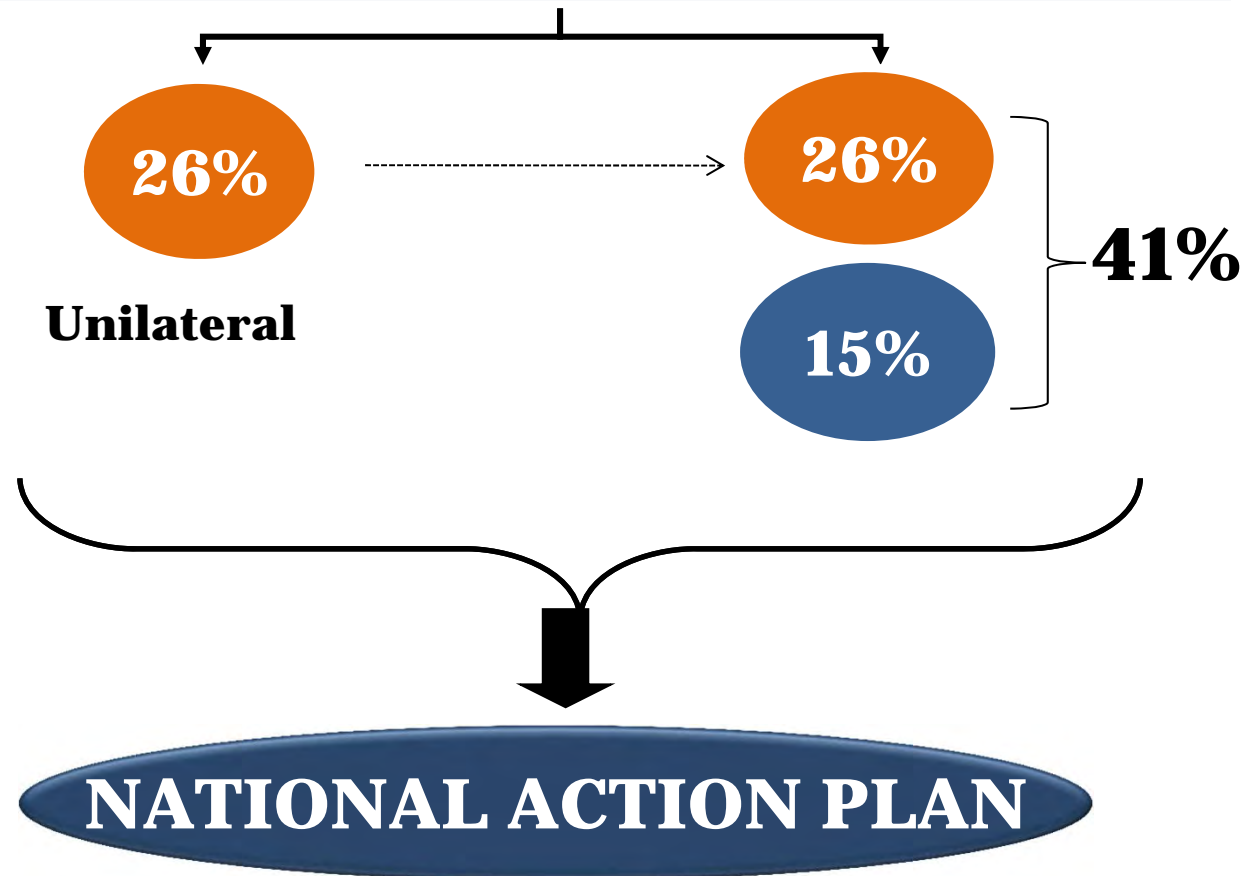


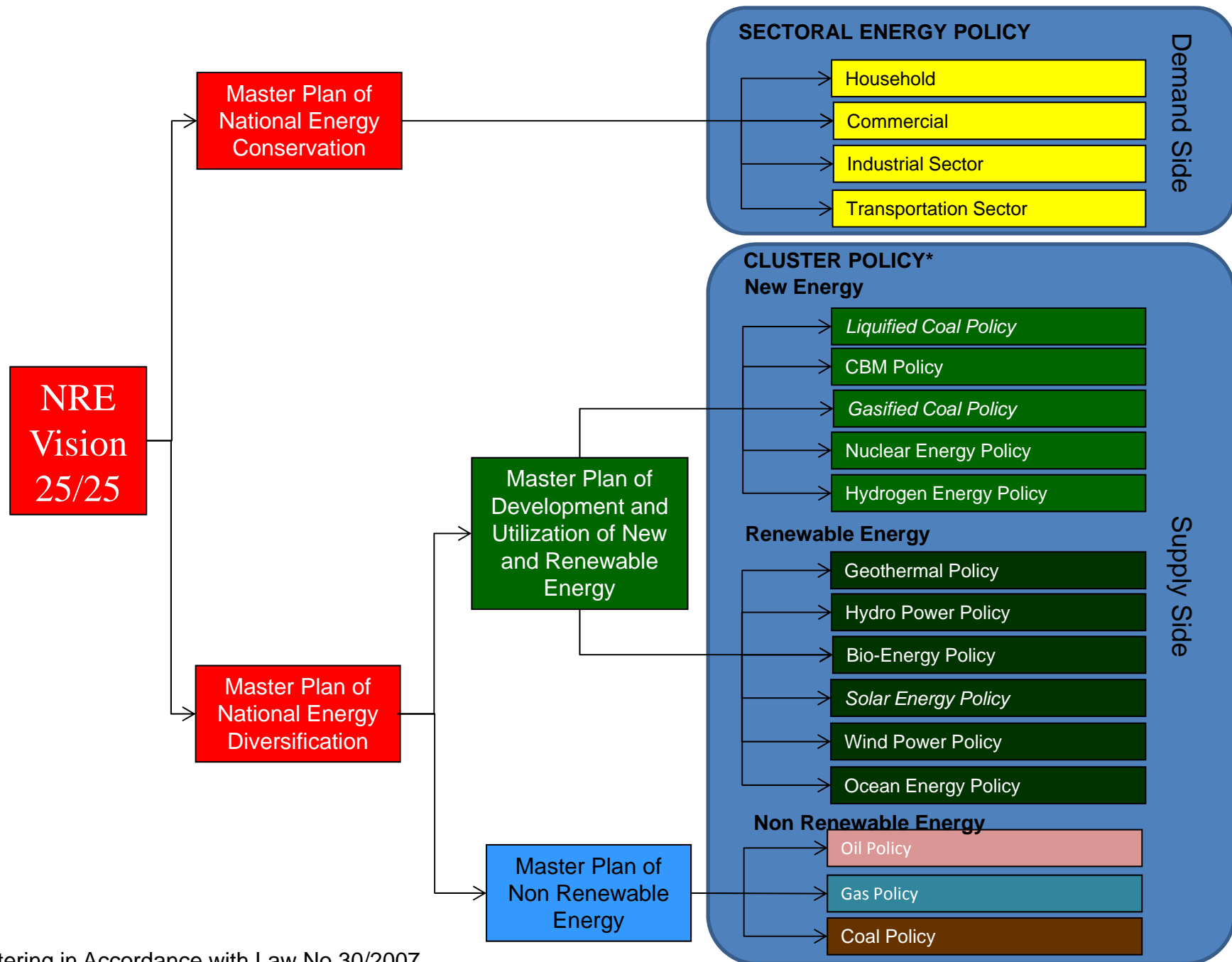
TRANSFORMATION ON ENERGY PARADIGM (Green Energy Initiatives)



Scenario of 2020 GHG Emission Reduction

President Commitment
G-20 Pittsburgh and COP15
To reduce te GHG Emission in 2020





*Clustering in Accordance with Law No 30/2007

HRD FOR NPP IN INDONESIA

BACKGROUND

- Indonesia has been planning to introduce the operation of NPP in accordance to support the national electricity production in the period of 2015 ~ 2019)
(stated in the National Act No. 17 / 2007)
- HRD is an important component of nuclear infrastructure and needs a long term commitment from the stakeholder.
- The National Team of HRD for NPP has been established (2008) consisting some members from various Institutions :
 - ❖ Ministry of Energy and Mineral Resources (MEMR)
 - ❖ Ministry of Research and Technology
 - ❖ National Nuclear Energy Agency (BATAN)
 - ❖ National Nuclear Regulatory Body (BAPETEN)
 - ❖ State Own Electricity Company (PLN)

STRATEGY OF HRD FOR NPP IN INDONESIA

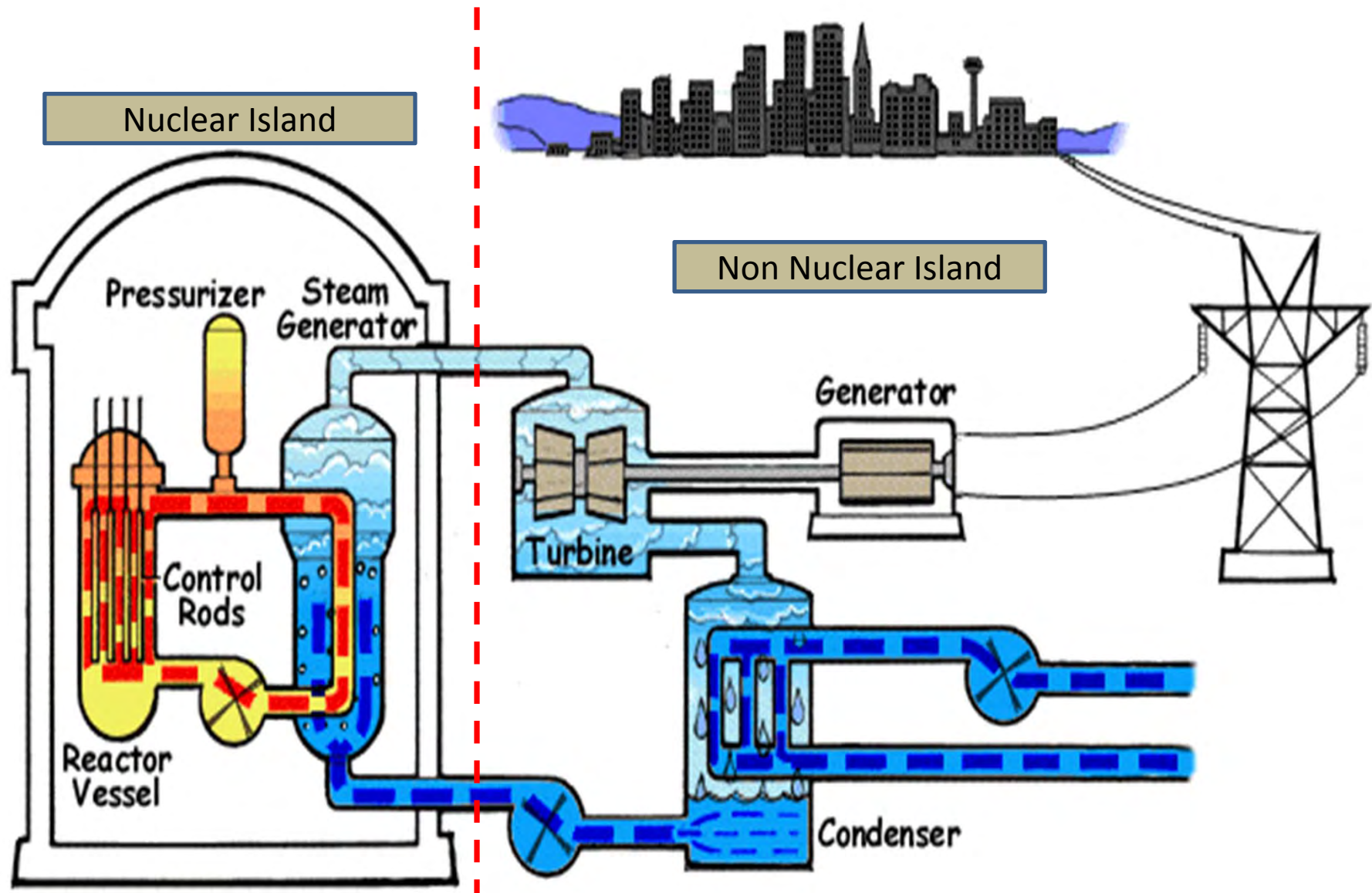
- “Every personnel who works in nuclear research, development and application should be provided adequate education and training in a certain level of competence”
- Indonesia has set the personnel competency standards

HRD's TEAM PROGRAMME

- Development of Academic Paper on “Preparation of Human Resource Development for NPP in Indonesia” :
 - ❖ Personnel requirements : quantitative and qualification (education, training and experience)
 - ❖ Existing infrastructure of HRD : education, training and licensing system
 - ❖ Action Plans
- Development of “Blue Print on Human Resource Development for NPP in Indonesia”
(Policy and strategy of HRD)
 - Establishment of Nuclear Training Center” for NPP
 - ❖ Organization aspect
 - ❖ Training Program
 - ❖ Facilities

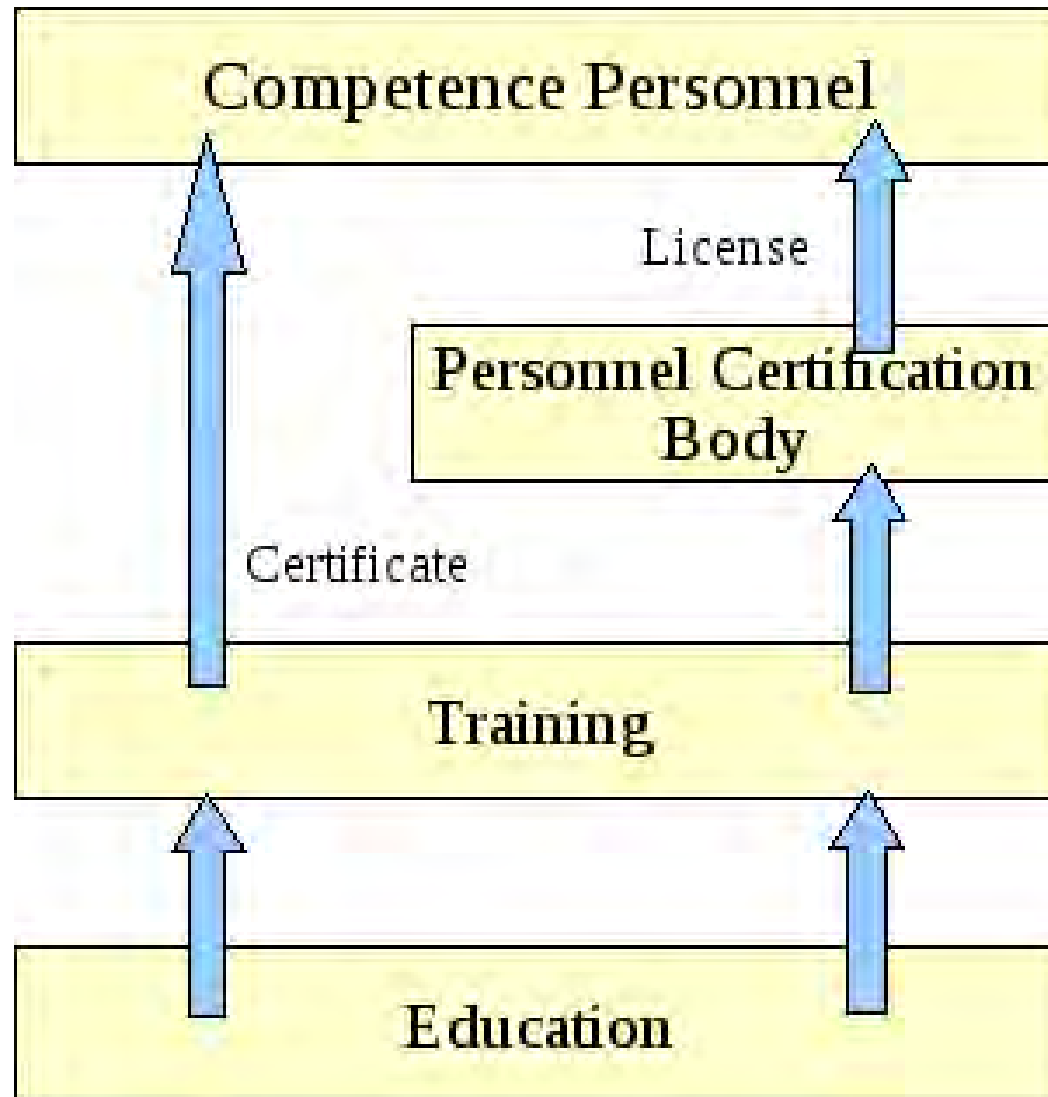
HRD Strategy

Working Area in NPP

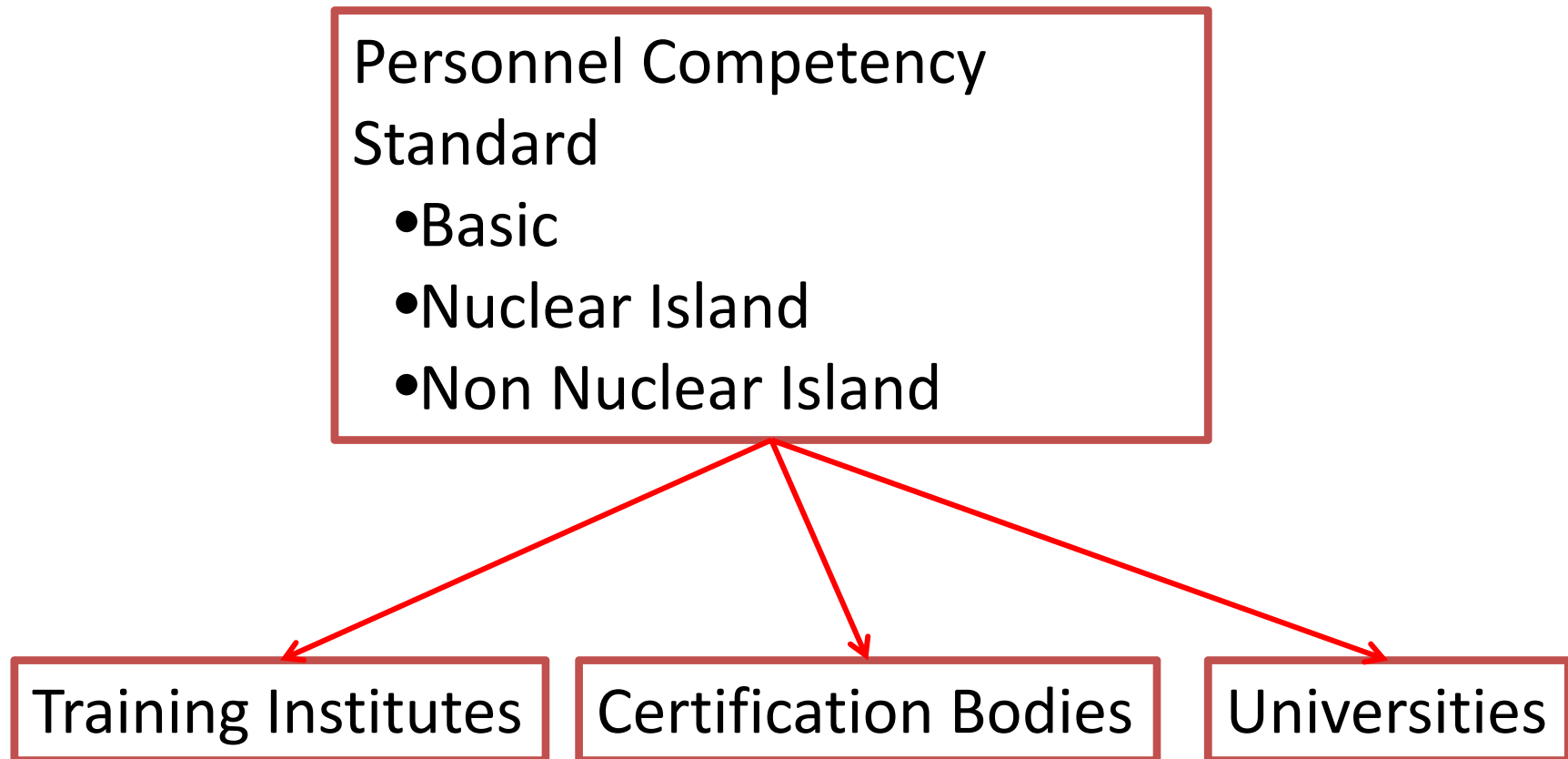


HRD Strategy

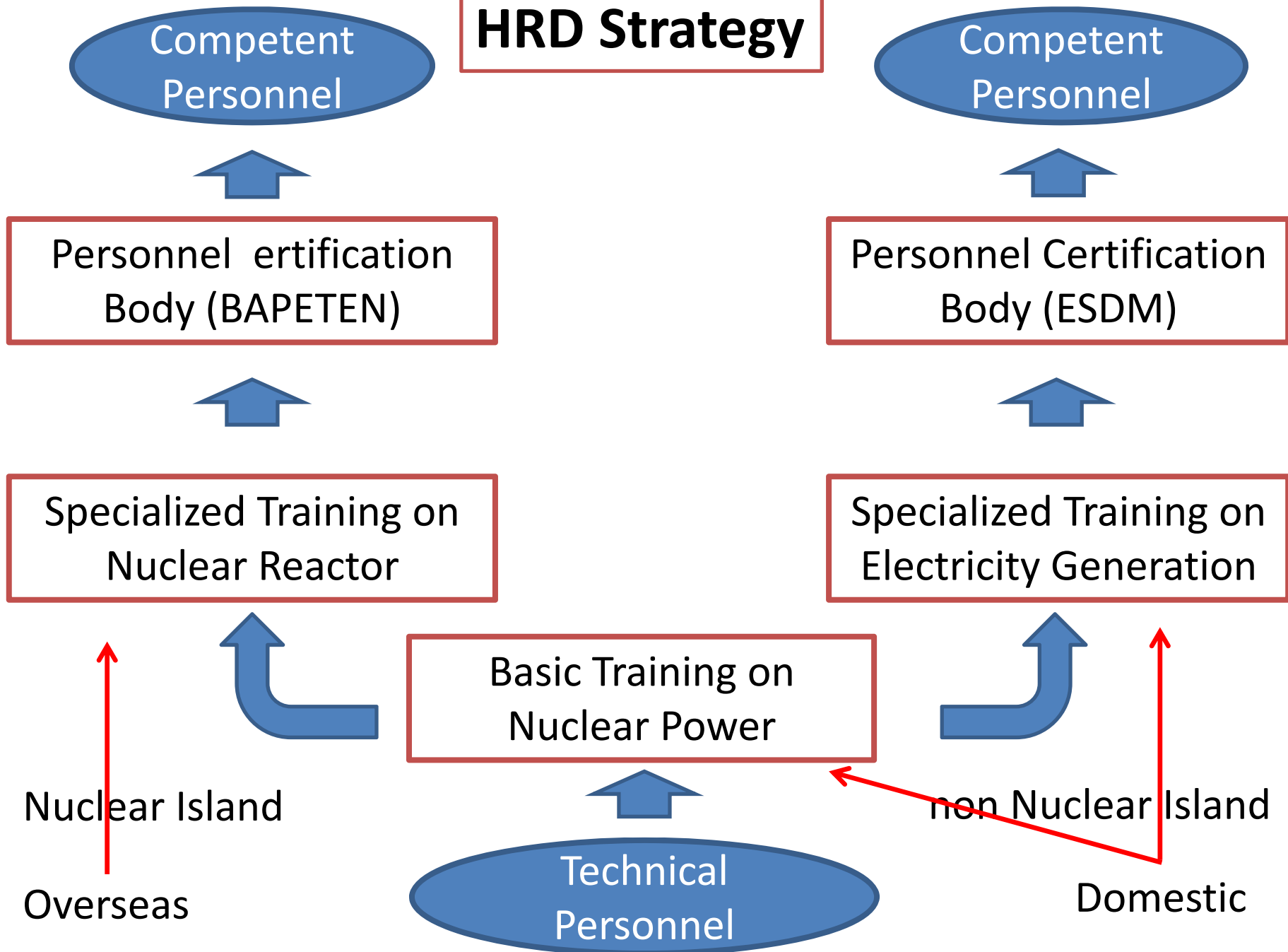
Personnel Competency Development



HRD Strategy



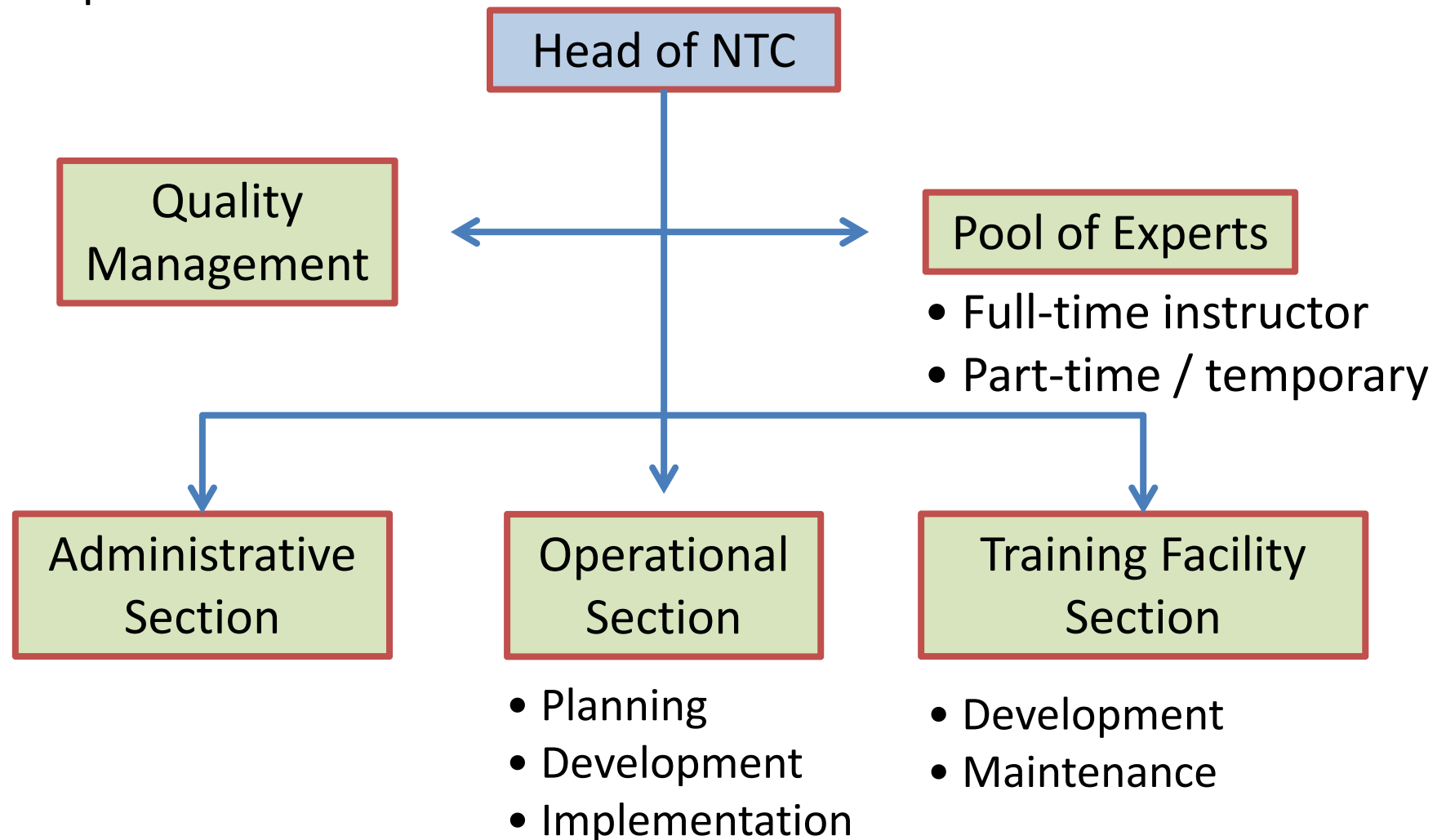
HRD Strategy



HRD Strategy

Nuclear Training Center (NTC)

A specific training institute for implementation of the HRD program for NPP personnel.



HRD Strategy

Personnel Competence
Standard

Standard
Curriculum

Training Material

Instructor

Laboratory

Training
Implementation

Bali



ACADEMIC PAPER HRD NPP IN INDONESIA 2012 - 2025

- **NPP Development Phase**

- Pre-project
- *Project Management*
- *Project Engineering*
- *Procurement*
- QA dan QC
- *Plant Construction*
- *Regulation and Licensing*
- *Commissioning*
- *Operations and Maintenance*

ACADEMIC PAPER HRD NPP IN INDONESIA 2012 - 2025

- **Quantitative Human Resource Need**
 - Professional
 - Technician
 - Craftsmen
- **Personnel Qualification**
- **NPP Organization**

The Basic Structure of Human Resource Development

- **Education**
 - University of Gajah Mada (UGM)
 - Institute Teknologi Bandung (ITB)
 - University of Indonesia (UI)
 - *Sekolah Tinggi Teknologi Nuklir (STTN)*
- **Personnel Training and Certification**
 - Subject acquirement in electricity
 - Subject acquirement in nuclear
- **Career Path Guidance**
 - Structural path
 - Non-structural path

Action Plan of HR Preparedness

- **National Participation on Human Resource Side**
- **Competency-based Standard for Nuclear Power**
- **Personnel Recruitment**

COMPETENCE STANDARDS

- SUB FIELD MAINTENANCE
- SUB FIELD OPERATIONS

Conclusion

- Indonesian Government yet has decision to develop NPP but The National Team has prepared of Blue Print on HRD for NPP in Indonesia and also develop of Academic Paper
- The National Team also has prepared Personnel Standard Competency for NPP
- Base on Personnel Standard Competency will be formulated Competency's base standard.

Conclusion

- International cooperation with experience country is very beneficial in order to develop and implement Training Program Cooperation base on personnel competency's standard.

Terimakasih

Borobudur

