

Country Report of Indonesia

POLICY AND CURRENT STATUS OF NUCLEAR FOR ENERGY AND NON ENERGY IN INDONESIA



Djarot Sulistio Wisnubroto
Chairman of BATAN

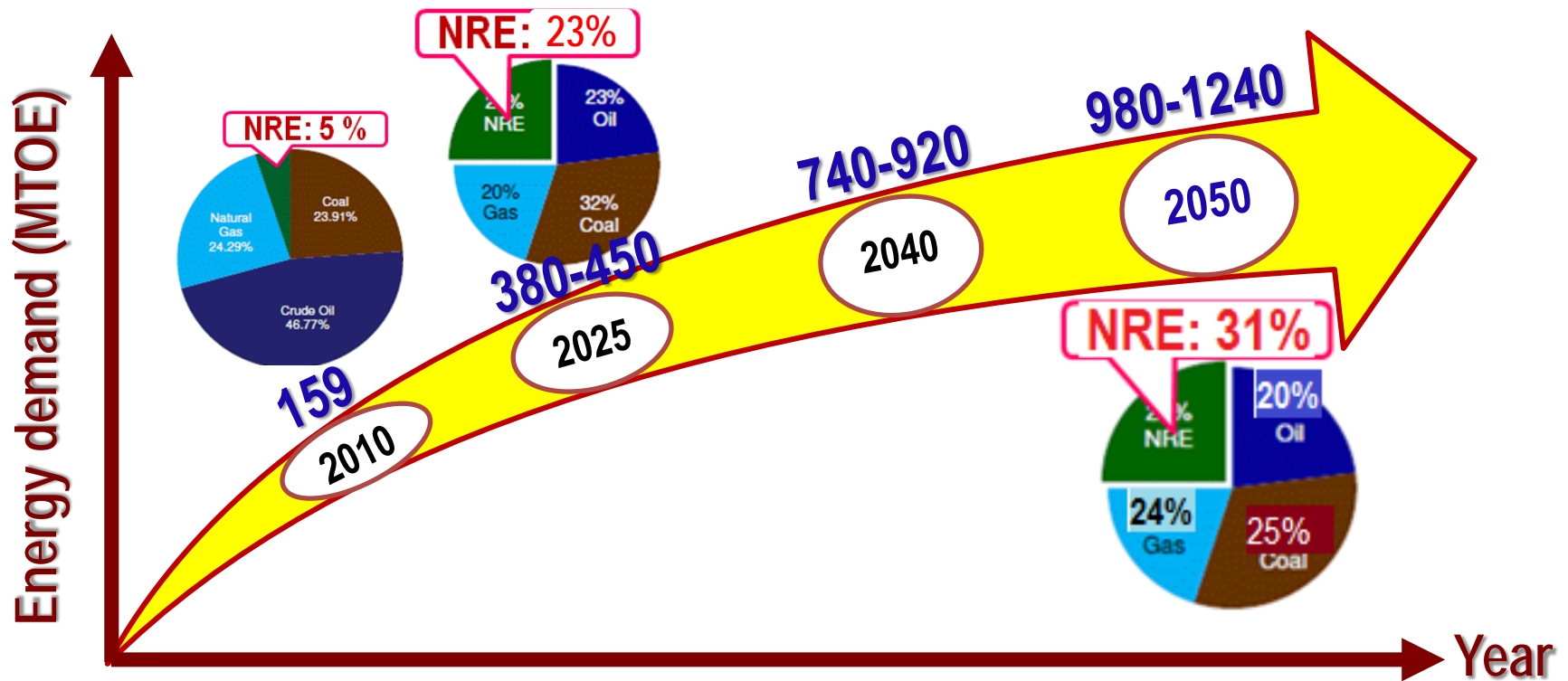


NATIONAL NUCLEAR ENERGY AGENCY OF INDONESIA

Tokyo-Japan, Nov 30, 2016

ENERGY POLICY: Energy Demand Projection Growth to 2050

Based on National Energy Policy , Gov. Reg. 7, 2014



- Energy Projection Scenario: economic growth, population growth, industrial and transportation growth.
- The government strongly encourages the growth and use of new and renewable energy (NRE). Nuclear energy (NPP) → **last option**.
- The President statement in National Energy Council (DEN, **June 22, 2016**) → create a roadmap of **NPP**, **build a power reactor research and build international networks**.

NUCLEAR POWER PROGRAM & STAKEHOLDER INVOLVEMENT

- **1970s:** idea to build NPP.
- **1991-1996:** FS in **Muria Peninsula**–Central Java multi-dimensional crisis and the anti-nuclear demonstration → NPP was postponed.
- **2011-2013:** FS in **Bangka Island** no decision to implement NPP.
- **2015:** Public Survey → **75.3%** respondents **accepted NPP**

Stakeholder Involvement:

- **Government:** regulation, technology selection, education, socialization, licensing, political decision, national program.
- **Legislative:** compliance with law, political decision, etc.
- **Local Government:** regulation, local benefit, political decision, social and environment impact, job opportunities.
- **Youth & Scientific Community:** local human resources involvement, socialization, social networking.
- **Media:** news worthy information, public information and opinion.
- **Community and NGO:** environment and social impact.

INDONESIA EXPERIMENTAL POWER REACTOR (I-EPR)



Location : PUSPIPTEK SERPONG
Power, Technol. : 10 MWth, HTGR
Construction : 2018-2022
Commissioning/Operation : 2022/2023
Project Status : pre-project has been completed

- I-EPR → entry points for NPP;
- Nuclear legislation → BATAN has an authority to build and operate **I-EPR** (non-commercial NPP);
- I-EPR → strategic effort for mastering NPP project management, engineering capacity building and HRD to strengthen the role of Technical Supporting Organization;
- I-EPR will be a master of Indonesia Commercial NPP in the future to support fulfilling energy demand.

ROLE OF NST IN AGRICULTURE

With mutation technique, Indonesia has successfully improved local rice varieties toward positive attributes such as **higher yield**, **earlier in maturity**, more insect and disease resistance, and with better quality than the original parents.

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Socialization

Demplot

Seed Distribution

Seed Production

Animal Food Supplement

Training

Harvest Ceremony

batan

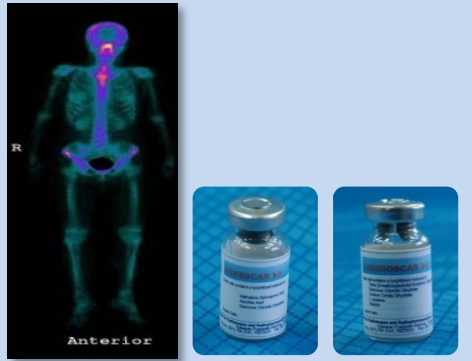


DISSEMINATION OF R&D ON NST IN AGRICULTURE



- 21 rice mutant varieties → have been released (by Min. of Agric.). **Mira1, Bestari, Sidenuk** have been grown widely by farmers & rice growers in almost all Provinces in Indonesia.
- In 2015-2016, the dissemination of mutant rice varieties has achieved > **92,000 Ha** → increased the **income of farmers ± 30%**.

ROLE OF NST IN HUMAN HEALTH



- **Radiopharmaceuticals, labelled compounds** for diagnostic and therapy → BATAN + **Kimia Farma Co. Ltd., Hospitals** (Hasan Sadikin, Dharmais, MRCCC Siloam)

- **Rrenograph** → kidney functions, thyroid up-take counter
→ installed in several hospitals

- Sterilized **Allograft, xenograft, amniotic membrane**
→ used in many hospitals and clinics



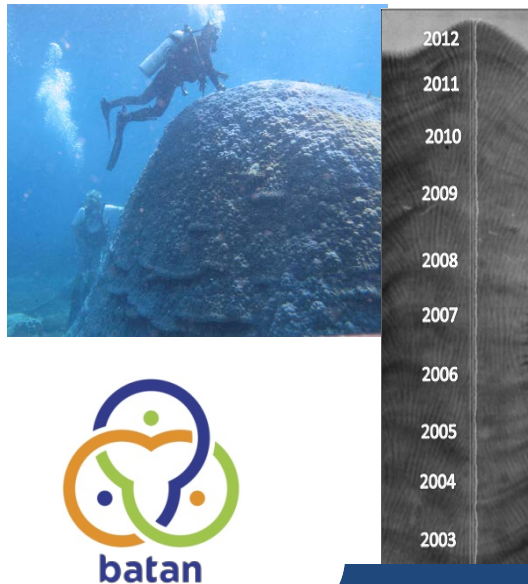
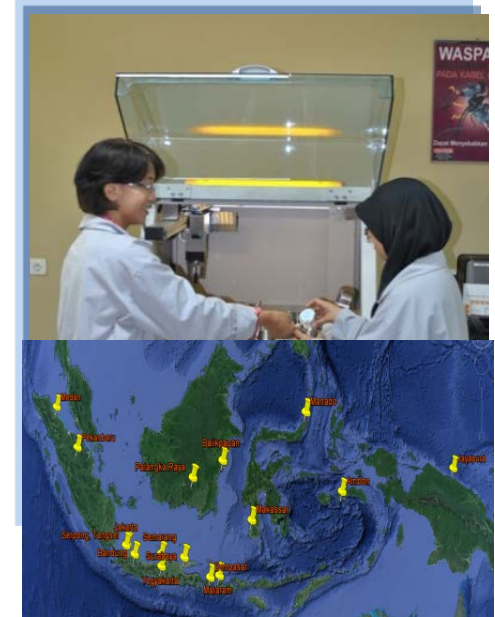
- BATAN + SEAMEO REFCO → contributing in fulfilling database of Indonesian food composition table (FCT)

- Radiation oncology → Cervical Carcinoma, Nasopharyngeal Carcinoma, Breast Carcinoma (RSCM GD-Jakarta, Dr. Sutomo GH-Surabaya)



ROLE OF NST IN ENVIRONMENT AND CLIMATE CHANGE

- **Environment:** BATAN + Ministry of Environment and Forestry, Local EPA, ANSTO → contributed in solving air pollution problems through application NAA, XRF and PIXE for characterization of airborne particulate samples, marine - river pollutant, soil, river sediment, underground water, *etc.*

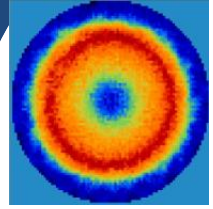


- **Climate Change:** reconstructed from massive coral reefs using NST for future prediction.

(BATAN + Ministry of Maritime Affairs and Fisheries of Indonesia, Universities (Bogor Agric., Diponegoro, Brawijaya), Okayama Univ., ANSTO).

ROLE OF NST IN INDUSTRY

NDE techniques (X-ray, gamma, CT, CR, Neutron Radiography) → developed and applied in various industries for troubleshooting, diagnosing and inspection.



Universities, government and private research institutions → involved in NDE R&D in supporting the IAEA-BATAN Collaborating Center.



Biodegradable plastics:

BATAN + local gov., private company, → to disseminate biodegradable to the traditional market at Central Java.



FNCA – PROJECT ACTIVITIES IN INDONESIA

Indonesia involves in all FNCA Project:

- 1. Mutation Breeding:** early in maturity, higher yield, resistance to insect and disease
- 2. Electron Accelerator Application:**
oligochitosan for PGP, PE, and anti virus.
- 3. Biofertilizer:** applied in combination with oligochitosan.
- 4. Research Reactor Network:** share information of operation & utilization of RR.
- 5. Safety Management Systems For Nuclear Facilities:**
self assessment and peer-review process nuclear safety facilities.
- 6. Radiation Oncology :** research on cervical, nasopharyngeal, and breast carcinoma.
- 7. NAA:** air particulate matter and laboratory inter-comparison for rare earth element.
- 8. Radiation Safety and Radioactive Waste Management:**
sharing information about radiation safety and radioactive waste management as well as *Emergency Preparedness and Response (EPR)*
- 9. HRD:**
cooperation with MEXT in supporting the education community in implementing the nuclear science lessons and established Nuclear Smartbook.
- 10. Safeguards and Nuclear Security:**
coordinating to evaluate DBT adapted to current status of national security, conducting 2nd self assessment of nuclear security culture, *etc.*

Celebrating
50 Years
of the Joint FAO/IAEA Division

Outstanding Achievement Award In mutation breeding

List of honour

Cereal and Native Grains
Research Program
Universidad Nacional Agraria La Molina
PERU

Mr Mirza Mofazzal Islam
Bangladesh Institute of Nuclear Agriculture
BANGLADESH

Radiation Mutant Breeding Team
Jiangsu Lixiahe Area Research Institute of
Agricultural Science,
Jiangsu Academy of Agricultural Sciences
CHINA

Plant Breeding Group
Center for Isotopes and Radiation Application,
National Nuclear Energy Agency
INDONESIA

Agricultural Genetics Institute
Vietnam Academy of Agricultural Sciences
VIETNAM

**THANK YOU
FOR YOUR ATTENTION**
ありがとうございます



IAEA
International Atomic Energy Agency

NATIONAL NUCLEAR ENERGY AGENCY
OF INDONESIA (BATAN)

IAEA Collaborating Centre

for

Research and Development and Capacity Building in
Nondestructive Diagnostics, Testing and Inspection
Technologies

2015–2018



Vienna, 24 Sept 2014



DG IAEA, Dr. Yukiya Amano, 23 Jan 2015