

Country Report of Indonesia

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



Presented on FNCA-MLM

Tokyo, 6 Dec 2018

**Ministry of Research,
Technology and Higher
Education - RI**



POLICY ON ENERGY

PP 79/ 2014 on the National Energy Policy (NEP) → CHANGE
THE PARADIGM OF ENERGY IN INDONESIA.

The government of
Indonesia has published the
Energy Outlook 2016 in
which presents national
energy condition and
projection in 2016 to 2050.

TECHNOLOGY DEMONSTRATION FOR PUBLIC

Annual public opinion surveys (2016) showed that the public acceptance level has tended to increase during the last five years, with the highest acceptance level measured of 77,53%. Site: West and East Bangka & Kalimantan.



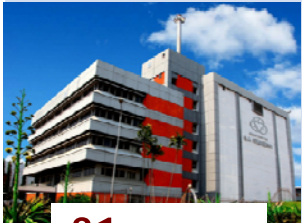
Indonesia is also continuing the development of 10 MW thermal experimental power reactor.

Basic Engineering Design (BED) stage was completed by 2016 and Detailed Engineering Design (DED) is targeted to be completed by 2018.

SERPONG NUCLEAR AREA Center For S & T (PUSPIPTEK)



UTILIZATION OF INDONESIAN RESEARCH REACTOR

Reactor	Utilization	Research Topics	Public Services	Users
TRIGA 2000  53 years	<ul style="list-style-type: none"> - Medical purposes - Industries - Material & radiometric analysis 	<ul style="list-style-type: none"> - Environmental radioactivity - Neutronic & thermohydraulic - Nano fluid 	<ul style="list-style-type: none"> - Facility for students visits - Radiopharmaceuticals production - Neutron irradiation 	<ul style="list-style-type: none"> - Hospitals - Industries - Researchers - Environment organization
KARTINI  39 years	<ul style="list-style-type: none"> - Sub critical assembly for Mo-99 research - Reactor experiments - Nuclear School - Internet reactor learning 	<ul style="list-style-type: none"> - BNCT research - Neutron activation analysis 	<ul style="list-style-type: none"> - Facility for students visits - Nuclear human resources development - Mechanical test 	<ul style="list-style-type: none"> - Universities
G.A.SIWABESSY MULTIPURPOSE  31 years	<ul style="list-style-type: none"> - Medicine & pharmacy applications - Material analysis - Aesthetic stone - Advanced Materials 	<ul style="list-style-type: none"> - Advanced Materials - Isotope production - Neutron Radiography 	<ul style="list-style-type: none"> - Neutron irradiation - Topaz irradiation 	<ul style="list-style-type: none"> - Universities - Nuclear institutions - Aesthetic stone company - Hospital - Industry



IAEA CC on Mutation Breeding

IAEA CC on NDTIT (NDE)

AMENDMENT OF THE NUCLEAR ENERGY ACT OF 1997

Indonesia is in the process of amending the Nuclear Energy Act (1997), under the coordination of the Ministry of Research, Technology and Higher Education, with the support of BAPETEN and BATAN.

The New Act will incorporate safety, security, and safeguards, as well as the authority to investigate any associated criminal act or violances, and the issue of countering proliferation finance in relation to nuclear terrorism.

MUTATION BREEDING

- Higher crops productivity
- Resistance to pests and diseases
- More adaptive to multi land
- Good quality and taste



NUMBER OF VARIETIES

- 23 Rice
- 10 Soybean
- 3 Sorghum
- 2 Mungbean
- 1 Peanut





Located at Serpong Nuclear Area,
Research Center for Science &
Technology
South Tangerang, BANTEN

Inaugurated at November 2017
by Vice President Dr. M. Jusuf Kalla



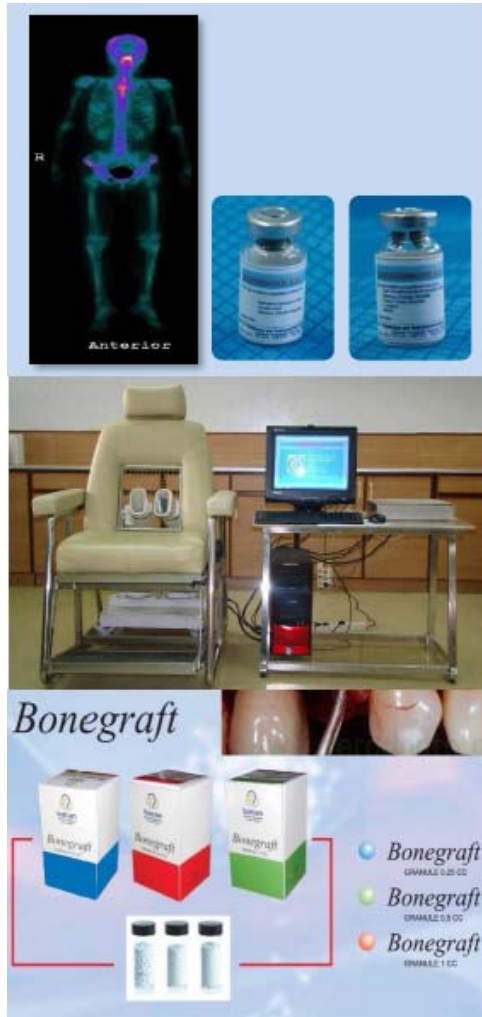
Irradiation Services

Potential Users

Foods:

- Cocoa Industry
- Chilli Powder
- Fruit Products
- Tea Products
- Seafood (fresh & frozen)

- ✓ Medical devices
- ✓ Tissue/biomaterial
- ✓ Packaging
- ✓ Lab-ware
- ✓ cosmetics and pharmaceutical raw materials
- ✓ Herbal products



Radiopharmaceuticals, labelled compounds
for diagnostic & therapy: BATAN + Kimia Farma Co. Ltd,
Hospitals (Hasan Sadikin, Dharmais, MRCC Siloam)

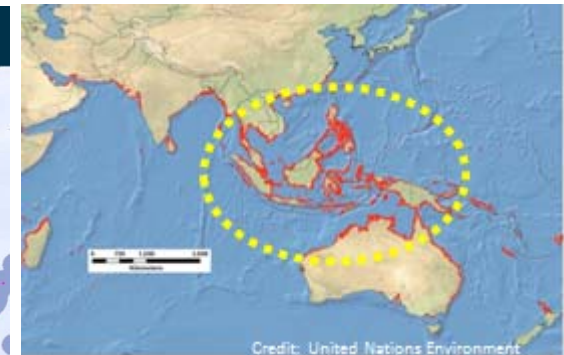
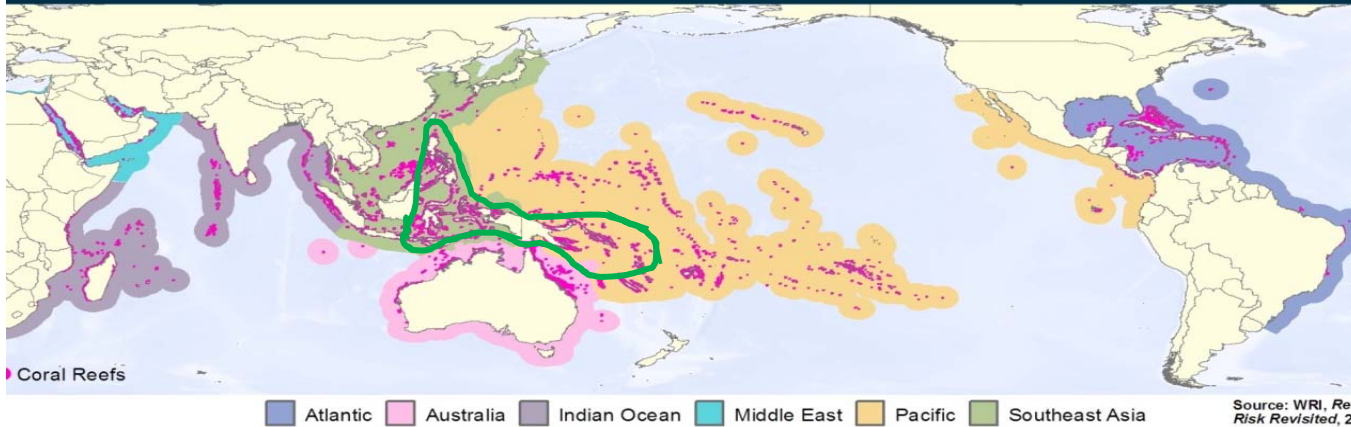
Radiation oncology → Cervical Carcinoma,
Nasopharyngeal Carcinoma, Breast Carcinoma (RSCM GD-
Jakarta & Dr. Sutomo GH – Surabaya)

Renograph → Kidney functions,
thyroid up-take counter
→ Installed in several hospitals

BATAN + SEAMEO REFCO → contributing in fulfilling
database of Indonesian Food Composition Table (FCT)

BATAN Research Tissue Banking → produce amniotic
membrane; bone grafts

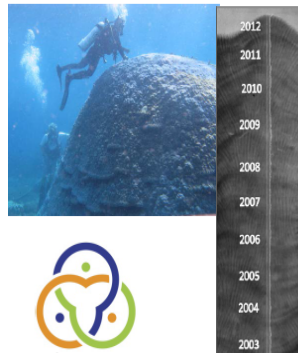
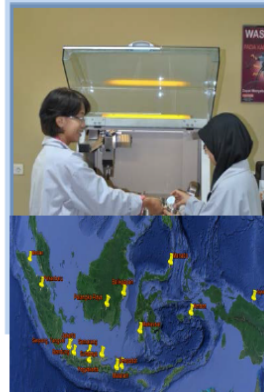
MAJOR CORAL REEF REGIONS OF THE WORLD



- ❑ Impacts of climate change to the marine and coastal ecosystem; increasing Sea Surface Temperature (SST), Sea Level Rise, coral bleaching and El-Nino, ocean acidification and extreme weather events;
- ❑ About 3 million hectares of mangrove forest grow along Indonesia's 95,000 km coastline. This is 23% of all mangrove ecosystems in the world;
- ❑ NST plays important roles particularly in the past time climate condition (paleo-climate) which is used for model prediction so that it will be needed for adaptation and mitigation.
- ❑ Collaboration: BATAN + Agency for R&D of Marine and Fisheries.

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).

- **Since 2017, Indonesia joint the FNCA – Research on Climate Change (RCC)**
- **lead by Australia;**
- **Indonesia has hosted the FNCA Workshop on RCC, 24-28 Sept 2018.**

Implementation on Mangrove → “Blue Carbon” on The Carbon Stock

- 80% of carbon in mangrove systems is stored in sediment.
- Sediment core; by using dating method of C-14 and Pb-210, it can be estimated the flux and rate of Carbon in the sediment, and combining with C-13 and N-15 for fingerprint (sources identification).
- Implementation, Indonesia conduct blue carbon research on mangrove forest in order to contribute to the regional Asia Pacific database in term of climate change.

IAEA and **the Ministry RTHE** concluded Practical Arrangements on enhancing technical cooperation among developing countries and strengthening South-South cooperation.

The Practical Arrangements cover a three-year period (2018-2021), providing a framework for the following activities:

- Provision of short- and long-term graduate and post-graduate education programs and training programs in the fields of nuclear for energy and non energy;
- Provision of experts and lecturers to conduct education and training programs and advisory missions to other developing countries;
- Use of laboratory analytical facilities in Indonesia to conduct collaborative activities.



THANK YOU
FOR YOUR ATTENTION

Terima kasih
Matur nuwun

ありがとうございます
Danke



BOROBUDUR TEMPLE



PRAMBANAN TEMPLE