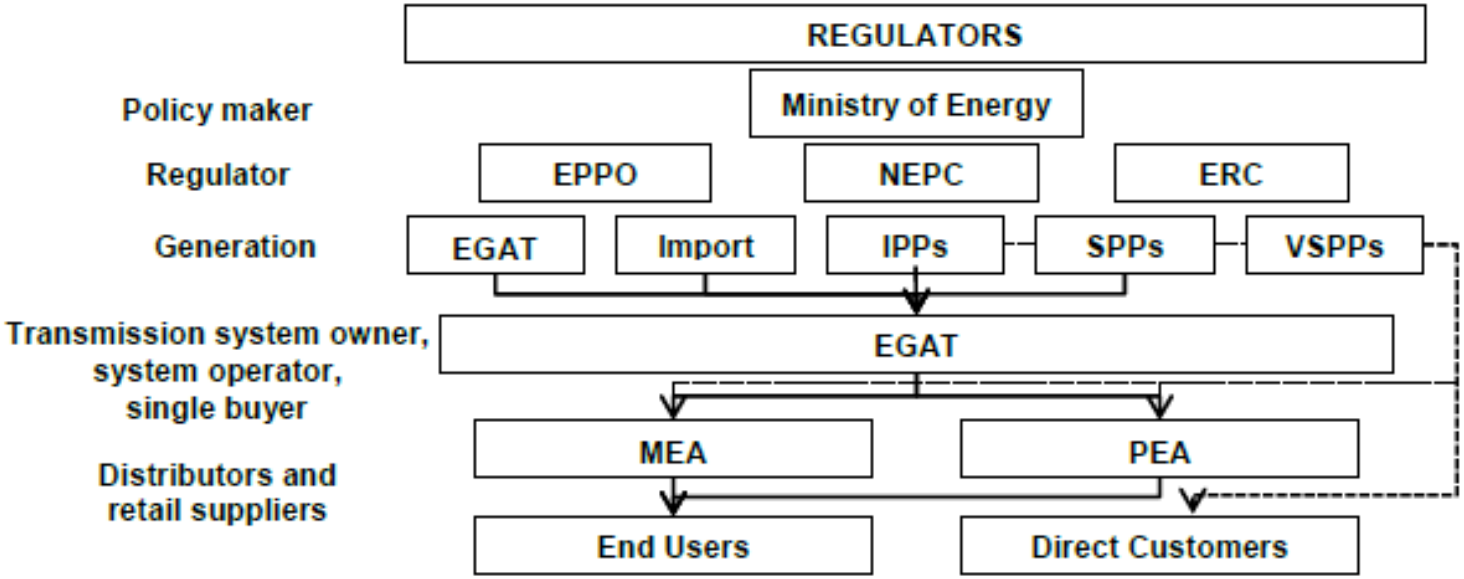
LEGAL FRAMEWORK OF NUCLEAR SAFETY AND PUBLIC PARTICIPATION

สถาบันเทคโนโลยีนิวเคลียร์แห่งชาติ (องค์การมหาชน)
Thailand Institute of Nuclear Technology (Public Organization)

ORGANIZATION OF THAILAND POWER SYSTEM

Figure 1: Organization of Thailand's Power System



EGAT = Electricity Generating Authority of Thailand, EPPO = Energy Policy and Planning Office, ERC = Energy Regulatory Commission, IPP = independent power producer, MEA = Metropolitan Electricity Authority, NEPC = National Energy Policy Council, PEA = Provincial Electricity Authority, SPP = small power producer, VSPP = very small power producer.

Source: Energy Regulatory Commission. 2012. *Thailand: Energy Regulation and the Promotion of Energy Conservation*. Bangkok.

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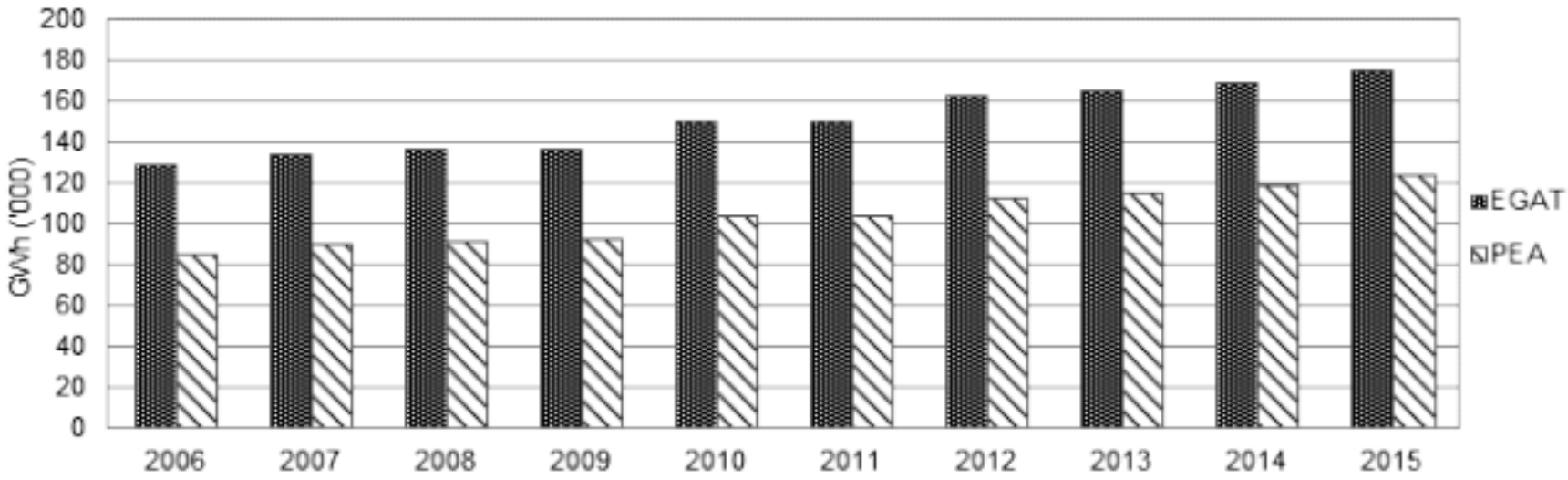
ELECTRICITY CONSUMPTION

Figure 2: Electricity Consumption



EGAT = Electricity Generating Authority of Thailand, GWh = gigawatt-hour, PEA = Provincial Electricity Authority.
Source: Energy Policy and Planning Office. 2016. *Thailand Energy Statistics*. Bangkok.

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ELECTRICITY CONSUMPTION BY SECTOR 2005 -2015

Table 1: Electricity Consumption by Sector, 2005–2015
(gigawatt-hours)

Year	Residential	Small General Service	Business	Industry	Agriculture	Others	Total	Change from Previous Year (%)
2005	25,482	11,894	17,781	59,669	249	6,164	121,239	5.3
2006	26,847	12,558	19,097	62,432	240	6,704	127,878	5.5
2007	27,938	13,207	19,991	64,553	268	7,157	133,114	4.1
2008	28,691	13,730	21,052	64,148	281	7,618	135,520	1.8
2009	30,257	14,342	21,347	60,880	318	8,037	135,181	(0.3)
2010	33,216	15,586	22,996	68,039	335	9,129	149,301	10.4
2011	32,799	15,446	23,660	67,942	297	8,711	148,855	(0.3)
2012	36,447	17,013	27,088	72,336	377	8,517	161,778	8.7
2013	37,657	18,374	30,413	72,536	354	5,007	164,341	1.6
2014	38,993	18,807	31,362	73,782	414	5,327	168,685	2.6
2015	41,286	19,768	33,219	74,773	387	5,401	174,834	3.6

( ) = negative value.
Source: Energy Policy and Planning Office. 2016. *Thailand: Energy Statistics*. Bangkok.

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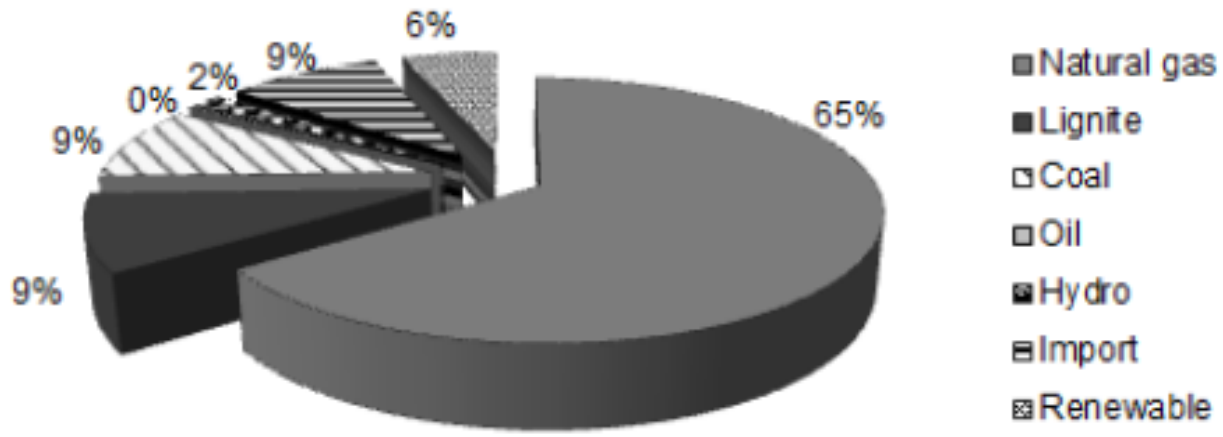
ELECTRICITY PRODUCTION BY FUEL SOURCE (JULY 2016)

Figure 3: Electricity Production by Fuel Source, July 2016



Source: Electricity Generating Authority of Thailand. 2016. *Thailand: Installed Generating Capacity (July 2016).* Bangkok.

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RATIONALE OF THE FORMULATION OF THAILAND ENERGY POLICY

1. Regional and Domestic economic situation which affect domestic energy consumption in Thailand such as Government's transportation infrastructure investment projects and the commencement of ASEAN Economic Community, AEC, in late 2015.
2. National Energy Policy Council, NEPC, approved the Framework and Assumption as a principle for the formulation process of PDP2015 on the 22nd October 2014.
   - Formulation of PDP2015 in accordance with the National Economic and Social Development Plan
   - Integration with the formulation of Energy Efficiency Development Plan, EEDP, and Alternative Energy Development Plan, AEDP.

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RATIONALE OF THE FORMULATION OF POWER DEVELOPMENT PLAN

1) **Security**

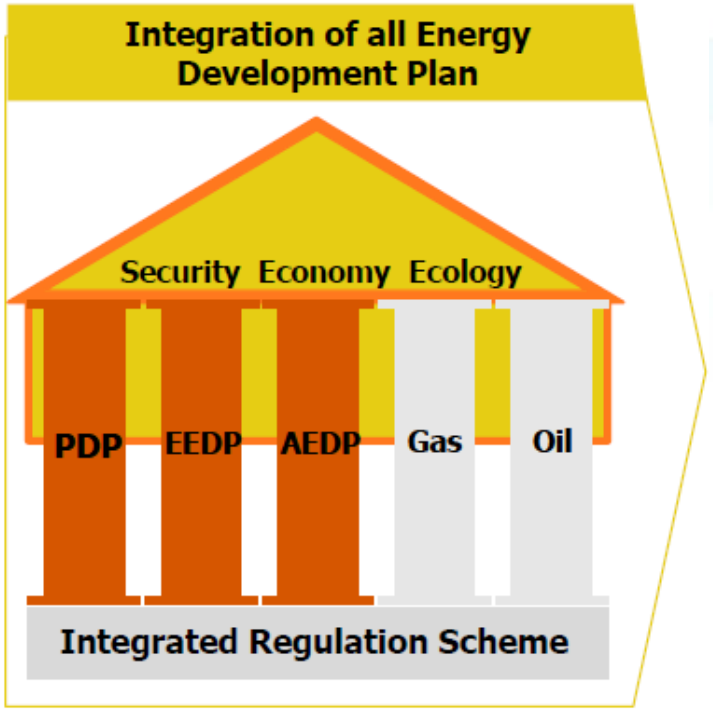
- Ensure the Security of all Power System Components
- Power
  - Generation, Transmission and Distribution
- Fuel Diversification to reduce

2**) Economy**

- Appropriate determination of Power Tariff to reflect the primary cost

3) **Ecology**

- Reduce / Minimize Ecological Impact to Environment and Community



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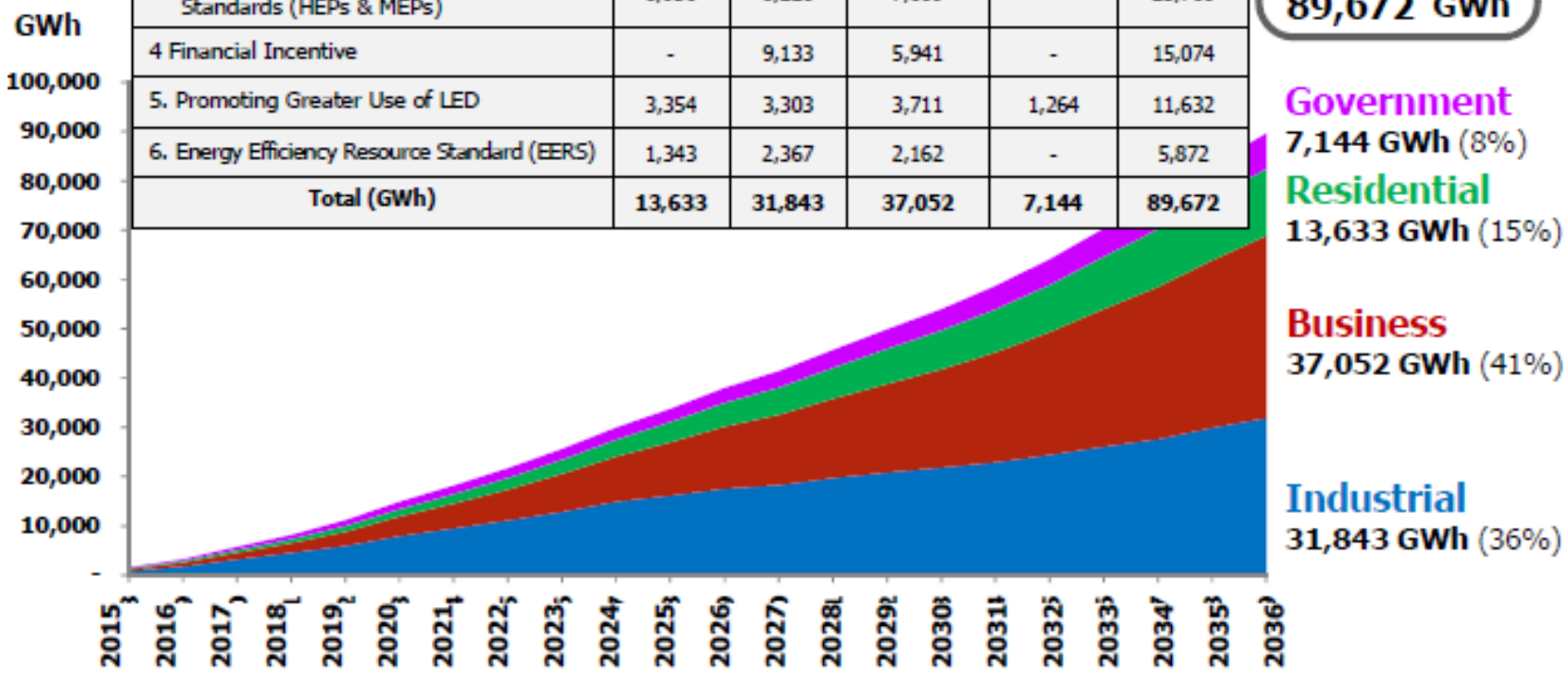
ENERGY EFFICIENCY TARGET FOR POWER SECTOR

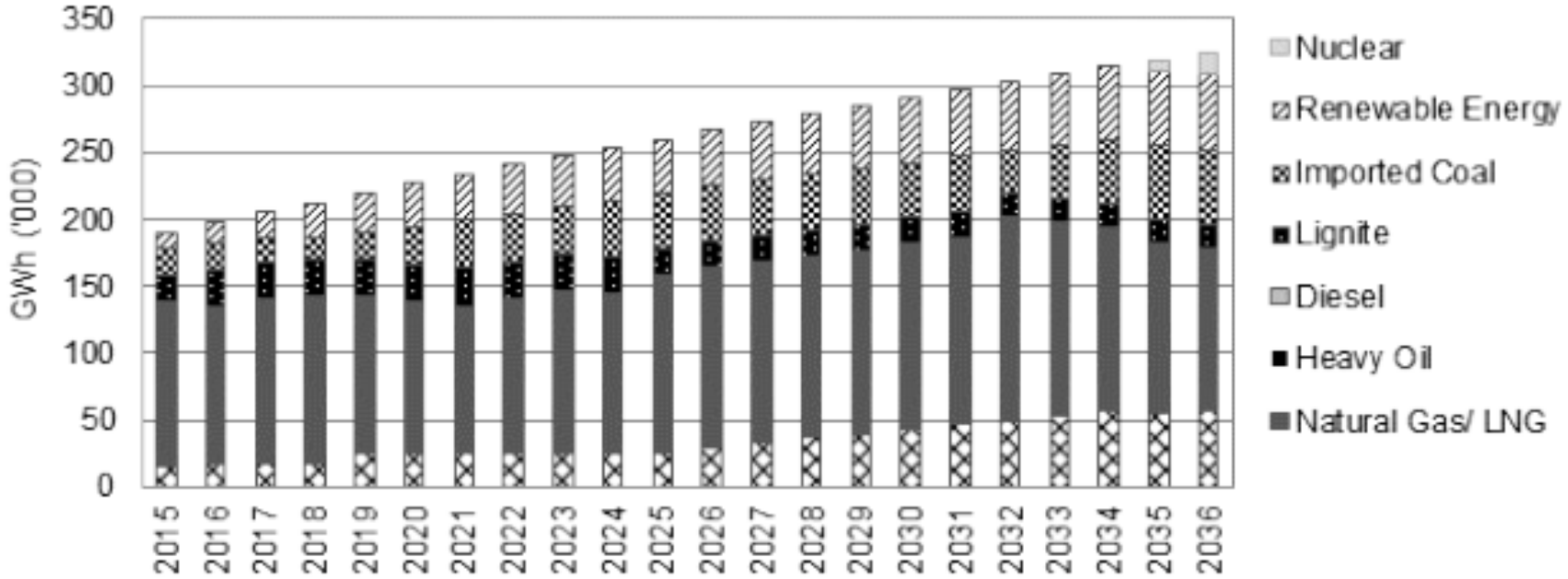
Energy Efficiency Target for Power Sector

Measure	Residential	Industrial	Business	Government	Total (GWh)
1. ENCON Act for Designated Factories and Buildings + Specific Energy Consumption	-	10,814	5,654	3,180	19,648
2. Building Energy Code (BEC)	-	-	11,975	1,711	13,686
3. High and Minimum Energy Performance Standards (HEPs & MEPs)	8,936	6,226	7,609	-	23,760
4 Financial Incentive	-	9,133	5,941	-	15,074
5. Promoting Greater Use of LED	3,354	3,303	3,711	1,264	11,632
6. Energy Efficiency Resource Standard (EERS)	1,343	2,367	2,162	-	5,872
Total (GWh)	**13,633**	**31,843**	**37,052**	**7,144**	**89,672**



FUEL MIX BY ENERGY GENERATION

Figure 4: Energy Generation by Fuel Type



GWh = gigawatt-hour, LNG = liquefied natural gas.
Source: Government of Thailand, Ministry of Energy. 2015. *Thailand Power Development Plan, 2015–2036.* Bangkok.

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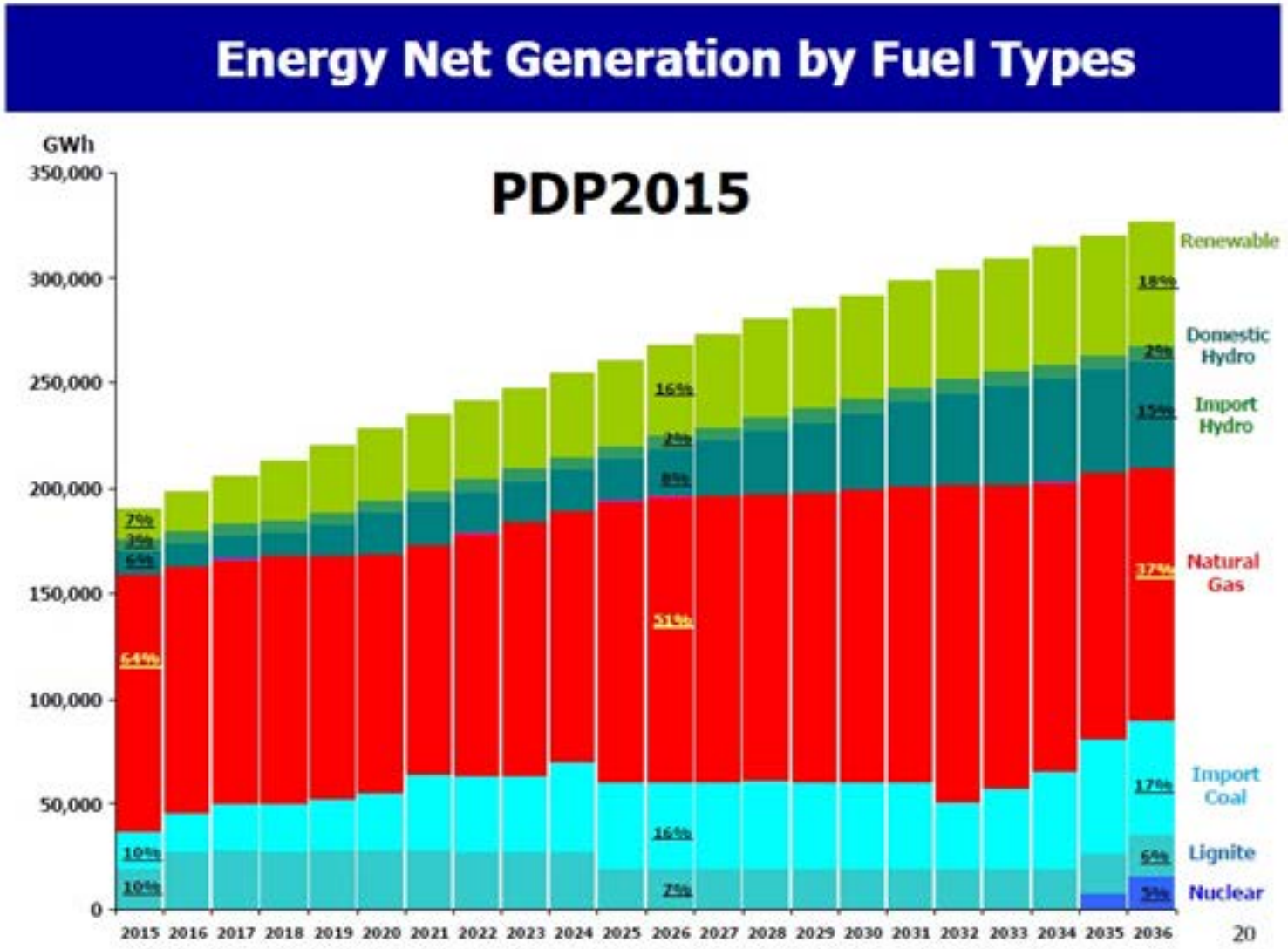
ENERGY NET GENERATION BY FUEL TYPES



ESTIMATION OF FUEL MIX FOR POWER GENERATION IN PDP2015

❖ Estimation of Fuel Mix for Power Generation in PDP2015

PDP 2015				PDP2010 rev3
Fuel Type	Sep 2014 (percentage)	2026 (percentage)	2036 (percentage)	2030 (percentage)
Imported Hydro	7	10-15	15 – 20	10
Clean Coal (inc. Lignite)	20	20-25	20 – 25	19
Renewable	8	10-20	15 – 20	8
Natural Gas	64	45-50	30 – 40	58
Nuclear	-	-	0 – 5	5
Diesel / Fuel Oil	1	-	-	-
TOTAL	100	100	100	100

LEGAL FRAMEWORK OF NUCLEAR SAFETY

- The body of Nuclear Energy for Peace Act 2016 created to regulate the conduct of legal or natural persons engaged in activities related to fissionable materials, ionizing radiation and exposure to natural sources of radiation.
- **NUCLEAR ENERGY FOR PEACE ACT, B.E. 2559 (2016)** aim to provide a legal framework for conducting activities related to nuclear energy and ionizing radiation in a manner which adequately protects individuals, property and the environment.
- The Nuclear Act enforce on 1st February 2016.
- The Ministerial Regulation is under progress of legislation 51 issues.

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INTERNATIONAL GUIDELINES FOR LEGAL INSTRUMENTS ON NUCLEAR SAFETY

- IAEA Safety Standards Series:
- Statutory basis – Article III.A(6)
- The Safety Standards Series comprises of:
  - Safety Fundamentals;
  - Safety Requirements; and
  - Safety Guides
- Publications of a regulatory nature covering various fields of nuclear safety

OTHERS PUBLICATIONS AS REFERENCES

- Fundamental Safety Principles, No. SF-1 (2006)
- Governmental, Legal and Regulatory Framework for Safety, No. GSR Part 1 (2010)
- International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, No. 115 (1996)
- Regulations for the Safe Transport of Radioactive Material, TS-R-1 (2009)

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INTERNATIONAL, MULTILATERAL AND BILATERAL AGREEMENTS

Thailand is party to and/or has signed:

- Treaty on the Non-Proliferation of Nuclear Weapon (NPT) (signed and ratified in 1972);
- Comprehensive Safeguards Agreement (signed and ratified in 1974);
- Convention on Early Notification of a Nuclear Accident (signed in 1987 and ratified in 1989);
- Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency (signed in 1987 and ratified in 1989);
- Comprehensive Nuclear-Test Ban Treaty;
- The South East Asia Nuclear-Weapon-Free-Zone Treaty (signed and ratified in 1995);
- The International Convention for the Suppression of Acts of Nuclear Terrorism (signed in 2005).

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INTERNATIONAL, MULTILATERAL AND BILATERAL AGREEMENTS

To formalize nuclear safety measures, Thailand would join or sign the following conventions in the near future:

- Convention of Nuclear Safety;
- Convention of Physical Protection;
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management;
- Convention on Supplementary Compensation for Nuclear Damage;
- Vienna Convention on Civil Liability for Nuclear Damage and Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention;
- Convention on Third Party Liability in the Field of Nuclear Energy and Convention of 31st January 1963 Supplementary to the Paris Convention.

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NUCLEAR ENERGY FOR PEACE ACT 2016

PRINCIPLES OF NUCLEAR ENERGY FOR PEACE ACT (2016)

- A number of basic concepts, are expressed as fundamental principles which can be mentioned in this regard:
- The safety principle;
- The security principle;
- The responsibility principle;
- The permission principle;
- The continuous control principle;

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NUCLEAR ENERGY FOR PEACE ACT 2016

PRINCIPLES OF NUCLEAR ENERGY FOR PEACE ACT (2016) (Cont.)

- The compensation principle;
- The sustainable development principle;
- The compliance principle;
- The independence principle;
- The transparency principle;
- The international co-operation principle.

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NUCLEAR ENERGY FOR PEACE COMMISSION

The Nuclear Energy for Peace Commission" consisting of:

1. The Prime Minister as Chairperson
2. The Minister of the Ministry of Science and Technology as Vice Chairperson
3. Ten *ex officio* members
4. Six qualified members appointed by the Council of Ministers from exert persons
5. The Secretary General of OAP

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POWER AND DUTIES OF THE COMMISSION

1. To propose policies and recommendations to the Council of Ministers on the issues of the use of nuclear energy also nuclear and radiation regulation for safety
2. To advise the Minister on issuing the Ministerial Regulations under the Nuclear Energy for Peace Act
3. To specify rules and oversee compliance with the terms or conditions in a license issued under the Nuclear Energy for Peace Act
4. To develop specific standards on nuclear energy
5. to promote and disseminate the knowledge on nuclear safety

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INTERNATIONAL INSTRUMENTATIONS

1. Convention on Nuclear Safety, 1994 (INFCIRC/449) (Future Plan) Does not apply to research reactors

2. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 1997 (INFCIRC/546) (Future Plan) Dose not apply to waste containing only naturally occurring radioactive materials (NORM) which is outside the nuclear fuel cycle

3. Convention on Early Notification of a Nuclear Accident, 1986 (INFCIRC/335) (21 April 1989)

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INTERNATIONAL INSTRUMENTATIONS

4. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, 1986 (INFCIRC/336) (21 April 1989)

5. Code of Conduct on the Safety and Security of Radioactive Sources, 2003 (INFCIRC/663)

6. Code of Conduct on the Safety of Research Reactors, 2004 (IAEA/CODEOC/RR/2006)

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Convention on Early Notification of a Nuclear Accident, 1986 (INFCIRC/335)

- Obligation to notify nuclear accidents
- Inform and assist in a nuclear accident or radiological emergency
- Based on a system of competent authorities and national contact points for information exchange
- Detailed information must be made known through these contact points so as to facilitate counter measures

CODES OF CONDUCT

- Instruments of a legally non-binding nature prepared at the international level to offer guidance for the harmonization of national laws, regulations and policies
- Safety of “research reactors” i.e. nuclear reactors used mainly for the generation and utilization of neutron flux and ionizing radiation for research and other purposes
- Addresses not only the role of the State and the Regulatory Body but also the Operating Organization

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“Who is primarily responsible for ensuring safety?”

- “Who is primarily responsible for ensuring safety?”
- The entity that has been consistently identified as primarily responsible is the operator or licensee who has been granted the authority to conduct specific activities related to nuclear energy or ionizing radiation.
- The fundamental principle that the operator or licensee should bear the burden of ensuring that its activities meet the applicable safety, security and environmental protection requirements.

PUBLIC PARTICIPATION

- Public Hearing for Government Projects per Prime Minister's Office Regulation
- Stakeholder means any person who may be affected or may suffer a loss caused by a government project
- Government Project means
  - Any project involving economic or social development, which is under either by direct, concessional, or authorized management of a government unit, and
  - That project has widely significant impacts on environment, health, way of life, or any other interest of stakeholders.

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PUBLIC HEARING FOR GOVERNMENTAL PROJECT

- **Notifying stakeholders of**
  - Method of public hearing
  - Period of public hearing
  - Place of public hearing
  - Project details enough to understand and comment
- **Using one or more of the following public hearing methods with stakeholders**
  - Polling
  - Consultative Meeting
- **Announcing the results of polling and consultative meeting within 15 days of completion**

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