The Energy Research Institute Network
Policy Recommendation for RE Deployment in EAS Region

1. Background

Expanded use of renewable energy (RE) has become increasingly important as a measure in response to global warming, to improve the energy self-sufficiency, as well as an option to upgrade the low rate of electrification in developing countries. To that end, many countries have developed and implemented RE policy; the main RE policy tool in Europe is the Feed-in-Tariff (FIT), while that in the US is the Renewables Portfolio Standards (RPS). Expanded use of RE is especially remarkable in Europe, and the share of RE to the total electric power generation exceeds 20% in Germany and Spain. However, in recent years, due to the soaring support cost (surcharge) etc., the FIT system is under review. Amid such a situation, new policy directions aimed at supporting the use of RE are sought after, including introduction of a Feed-in-Premium (FIP) where a RE support (premium) is added and linked to the power market price coupled with a competitive bidding to determine the level of premium.

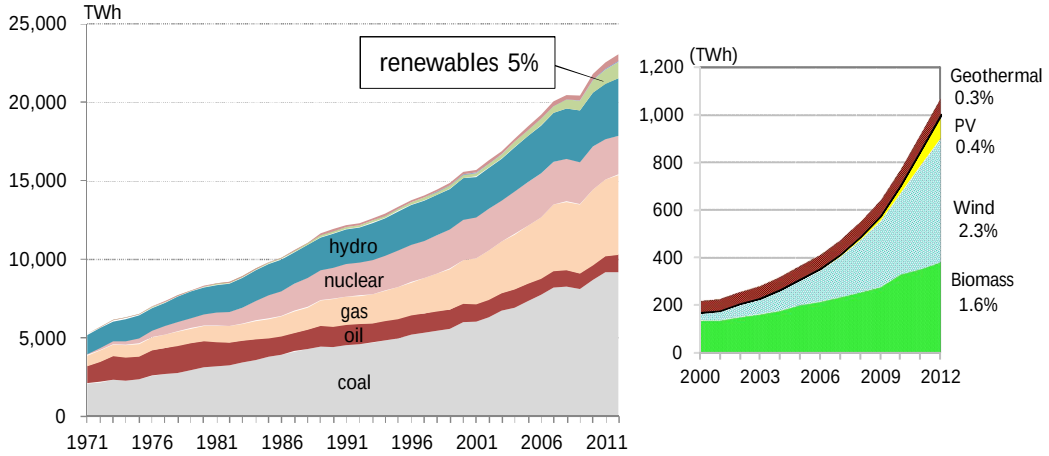
Based on the understanding of the current situation regarding RE, various useful discussions were held at the First ERIN Workshop. Discussion topics included information on benefits obtainable by EAS countries, focusing on RE policies and the use of net metering. Some EAS countries grant subsidies for the cost of generation or the electricity tariff, and the discussion was extented to cover situations as such.

2. Current status and outlook of RE power generation

In recent years, the volume of wind and PV power generation is increasing. However, the share of RE (wind power, PV, biomass and geothermal) in global electric power generation is still around 5% (2012)[1].

[1] Energy Balances of OECD Countries, IEA, 2014

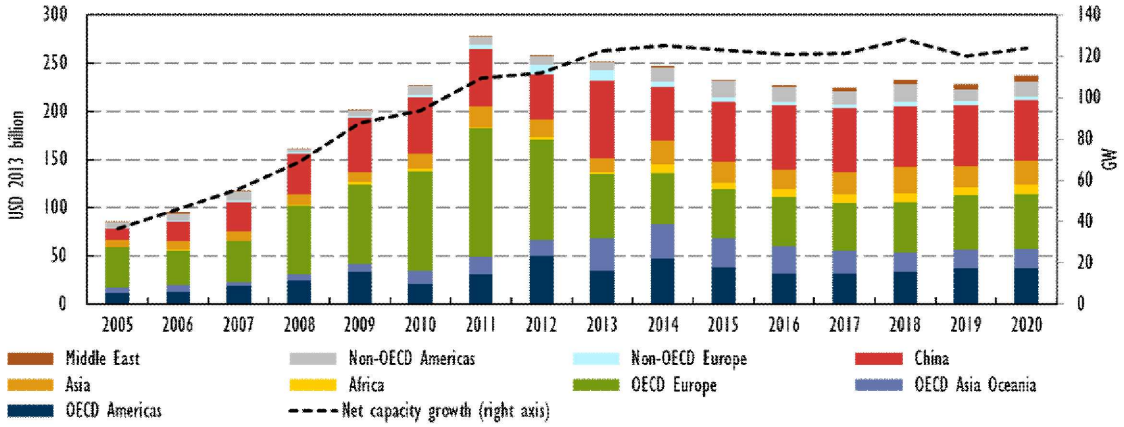
Figure1: Global Transition in the Electric Power Generation



(Created from Energy Balances of OECD Countries, IEA, 2014)

According to the IEA, global investment into RE has declined after peaking in 2011. After leading the investment into RE in the past, the decline is particularly prominent in Europe. Accordingly, various countries and regions including Asia may have a larger share of investment in RE in the future. However, steady implementation of RE policies is critically important to maintain a high level of investment.

Figure 2: Record and prospect of investment into RE.



Source: IEA, Medium-Term Renewable Energy Market Report 2014

3. RE policy

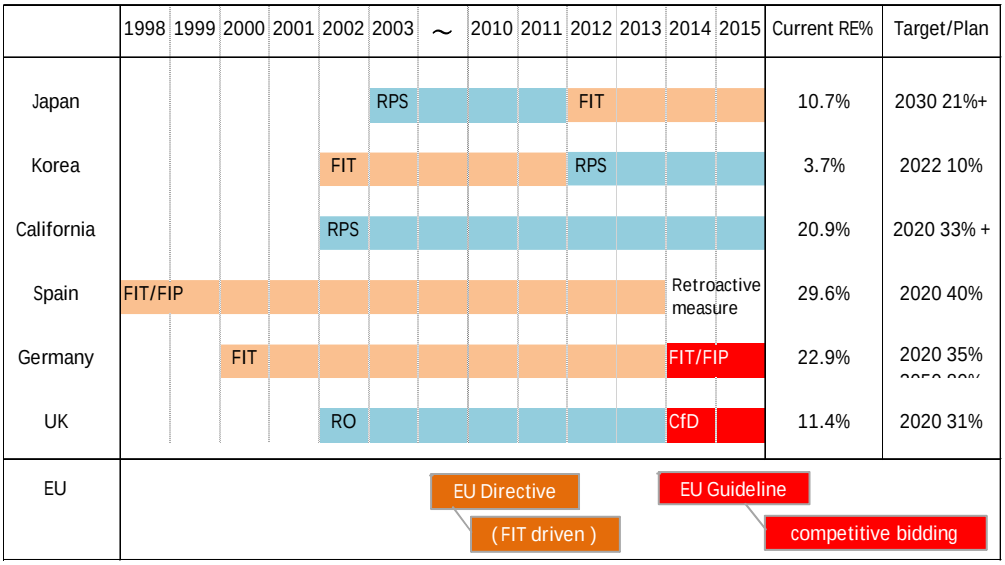
3. 1 Transition in promotion measures

RE policies adopted can be roughly divided into FIT (in Europe) and RPS (in the US). In Europe, abolition or review of FIT is currently in progress. In Japan, RPS was introduced in 2003, which was then replaced by FIT in 2012. In Korea, FIT was first

adopted in 2003 and had implemented until 2011, which was then replaced by RPS in 2012. In California, US, RPS has been implemented since 2002. As described later, Europe is reviewing preferential treatment policies under the current FIT, and is in the process of pursuing a new direction for RE promotion aimed at enhancing the linkage with the power market.

There are two methods for calculating the amount of RE electricity to feed-in. One is to feed-in all the power generated from RE, and another is to feed-in only the excess amount after subtracting the self-consumed electric power. In Europe the former method (feed-in all RE generation) is the main method, while in the US surplus feed-in, or net metering, has been implemented in 43 states[2].

Figure 3: Transition in RE policy at main countries and regions



Source: IEEJ based on various material

3.2 Implementation cases

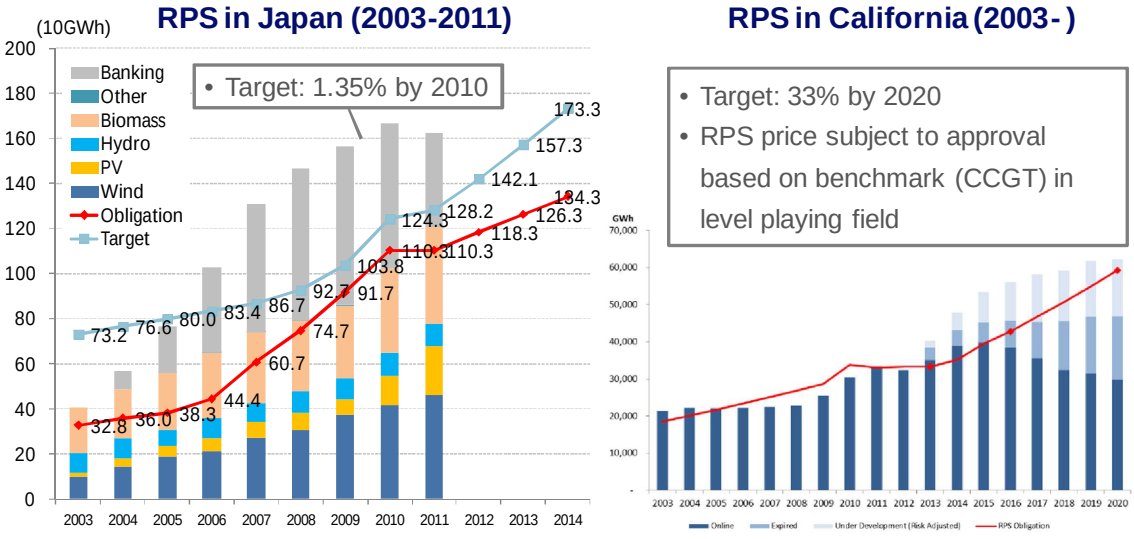
Looking at the cases of actual implementation, the system and outcome of measures such as RPS and FIT vary broadly. For instance, on introducing RPS in Japan (2003-2012), the initial implementation target (overall target: “national usage target”) was specified to be 12.2 billion kWh in 2010 (approximately 1.35% of the electricity sales). However, in the second year after implementation, i.e. in FY2005, it was found that the procured amount including the banking (carry over) from the previous fiscal year exceeded the total of obligatory amount (amount required to each company:

[2] Database of State Incentives for Renewables & Efficiency; as of September 2014

"standard usage amount")[3] by about 50%. Ever since, RPS power procured by the obliged companies have constantly surpassed the standard usage amount as well as the national usage target and the obliged companies kept carrying over the surplus from one year to another. Even in this continuous situation of oversupply, the RE power purchase agreement (price, purchase term, etc.) were left to be decided by the market, and as a result investment into RE was dampened. On the contrary, in California, US, a target to supply 33% of the net system energy demand with RE by 2020 was established, and allocation to each company is specified accordingly to this target. Additionally, the government has adjusted the system by, for instance, conducting administrative examination on the procurement price of RPS and giving a certain level of advantage to RE by reflecting the global warming countermeasure cost.

Regarding FIT, there were cases, like in Japan, where a fixed tariff was specified by the government each year, and there were other cases, like in Spain, where an option was given to choose from a fixed tariff or a premium added to the power market price. While there were differences in the design of the FIT system, as with these examples, the introduction of RE, in particular solar power, rapidly progressed in the countries that adopted FIT.

Figure 4: RPS in Japan and California

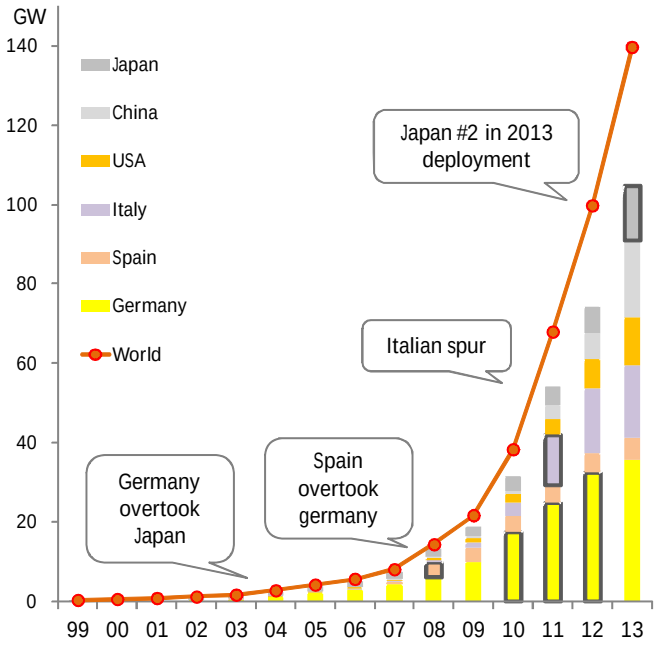


Note: CCGT is Combined Cycle Gas Turbines

Source: IEEJ based on various materials

[3] In RPS adopted in Japan, it was stipulated that the obligatory amount (standard use) actually imposed onto the target business operators shall be adjusted based on the performance of each company to avoid sharp increase in burden. To that end, while the total of standard use did not match the implementation target, the gap between the two was to be filled gradually.

Figure 5: Development of the solar power plant capacity in the world.



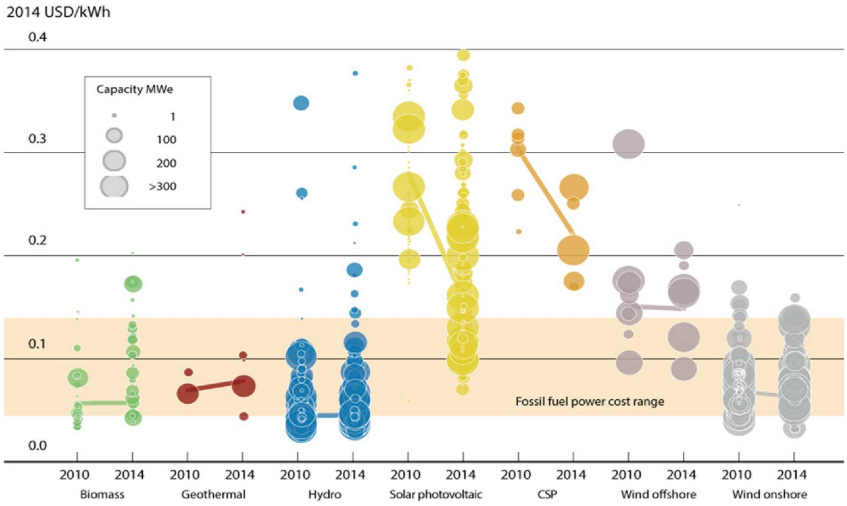
Source: IEEJ based on IEA PVPS 2015 data

3.3 Issues

Some issues surfaced for RE policies centering on RPS and FIT. For RPS, the key is to create demand that encourages promotion of investment and market competition in RE (target setting), and taking political initiatives to enable such target setting becomes important. It is also pointed out that in RPS the power selling price is determined by negotiations among the relevant parties or market trading, which induces uncertainty in the investment return and associated risk premium, and as a result the implementation cost is raised.

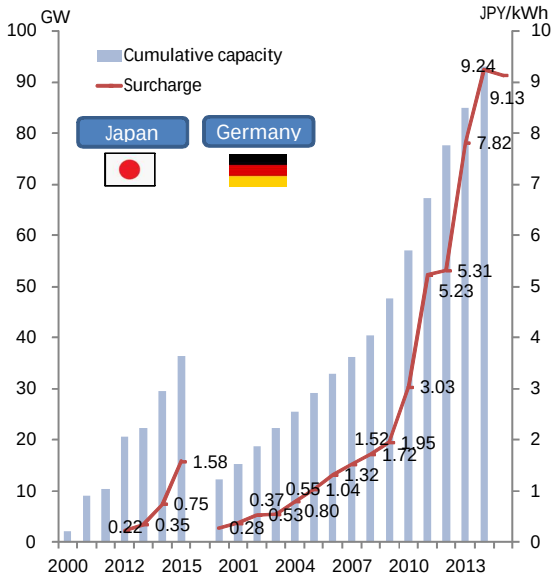
Meanwhile, with FIT where the priority is placed on the certainty of investment, there is a possibility that the subsidy level is too large. However, even where the cost of RE generation has fallen, it may be politically difficult to reduce the tariff duly reflecting such cost decline due to vested interests. In the system of FIT, the purchase cost is often passed onto users. However, as has happened in Japan and Germany, such a pass through of cost (surcharge) sharply increases along with the expansion of RE power generation purchased under the FIT.

Figure 6: Transition in the RE generation cost in the world.



Source: IRENA Renewable Cost Database, executive summary

Figure 7: Transition in FIT surcharge in Japan and Germany.



Source: BMWi Germany and Natural Resources Agency of Japan

Against this backdrop, the search for new methods of promoting the use of RE has started mainly in Europe. Europe has long promoted liberalization of the power market, and recently there arose criticism that RE promotion measures based on FIT has distorted the power market. In reality, there emerged an issue of the profitability of conventional thermal power plants worsening significantly due to the massive introduction of RE subsidized by FIT. In response to such situations, EU-wide

guidelines were released by the European Commission, stating that measures to facilitate the use of RE shall be compatible with market structure and the power system operation[4].

As specific measures, the Guidelines abolished the obligatory purchase by FIT for new large-scale RE generation facilities (500 kW or higher), and stipulated transition to a Feed-in-Premium (FIP) system where the RE generators directly sell power at the market price and the difference between the support level (hereinafter “standard price”) and market price is to be subsidized by a premium. Additionally, the Guidelines specify that facilities with 1 MW or more shall use competitive bidding from 2017 onward to apply the standard price and determine its level.

The UK has already adopted the Contract for Difference (CfD) system. CfD in principle is similar to FIP, yet it specifies that RE generators pay the difference when the market price exceeds the standard price. For electric power from RE source with established technologies (e.g., onshore wind, PV), it is stipulated to determine the standard price by using the competitive bidding.

Such FIP and bidding systems aim to improve the efficiency of support measures by utilizing market mechanism, yet, from the viewpoint of securing the investment into RE, they also have an aspect of placing priority on the long-term stability of the RE system. RPS and FIP both require direct sales of power in the market. However, with RPS price is determined in the market, whereas with FIP the price is specified by government or a premium determined through bidding is provided by the government or an organization established by the government via a long-term contract[5]. As a result, these systems bring a level of certainty and long-term stability to the profitability of RE business.

Meanwhile, it is assumed to be politically difficult to raise the electricity tariff in countries where the power generation sector is not liberalized and the electricity tariff is regulated. In those case, it will be necessary to secure the funds for supporting the use of RE by methods that are different from the FIT system in Europe or in Japan where the cost is recovered from the users through the electricity tariff. If the cost is to be covered by the national budget, the increase in the state expenditure on RE will necessitate the peoples' acceptance. When subsidies are granted to generation fuel (especially fossil fuel), it may raise a question over comparative costs of generation, and the policy integrity needs to be secured in view of the climate change policies.

[4] Guidelines on State aid for environmental protection and energy 2014-2020, European Commission

[5] For a case of onshore wind power generation, CfD in UK is for 15 years, and FIP in Germany or Italy is for 20 years.

3.4 General comment on RE policy

The RPS, FIT, FIP and bidding systems described above have advantages and disadvantages as follows:

- The effect of FIT is determined by the level of tariff set by the government, and the RE introduction effect becomes high when the tariff is high, yet the burden on the rate payers also becomes heavy. Thus, it is necessary to adjust the tariff flexibly based on certain criteria such as the capacity added.
- FIP that comes with obligatory direct marketing is similar to FIT in making preferential treatment to RE in terms of providing financial aid, yet FIP is expected to promote power supply in accordance with the demand and competition among RE generators, since the profitability of RE generators depends on market sales. FIP also enables the reduction of cost by adopting a bidding system to determine the level of premium through market competition. For sectors where the RE technologies and market are established to a certain degree, it may be desirable to recommend a shift to such a system based on market mechanism. Meanwhile, with FIP, project feasibility may be sacrificed if low-price bidding is induced, there is a difficulty for small-scale business operators to enter the market.
- RPS is a system where policy makers determine the volume or the share of RE electricity introduced and the market determines procurement details (e.g., energy source, price, terms and conditions). Setting the target at an appropriate level is important in RPS, and RPS also has an issue of high profitability risk that the RE generators has to take. Adequate demand and various options and providers being available in the market are the preconditions for the RPS system to materialize its intended effect.

4. Policy Recommendations

Based on the landscape of RE policy discussed above, policy recommendations that should be considered in EAS countries are as follows:

- Assessment of policies options should include both the effectiveness and efficiency of alternatives. Whether policies achieve the desired outcomes, while meeting demand of electricity including disadvantaged communities at low cost is an important point to be checked.
- Policy needs to be considered comprehensively. For example, integrating carbon pricing and resource pricing within the overall context of achieving RE outcomes.

- While the EAS region has abundant RE potential, the geographic distribution and the exploitation status varies. If further promotion of RE is desired, further measures are needed.
- RE policy should be selected by taking into account the availability, maturity, market scale, etc. of the RE generation technologies.
- Ways to share the cost of RE introduction by the society should be well considered prior to the implementation of support scheme. In order to keep the support cost under control, support policy should include a system design that encourages market competition of RE supply, especially where the generation cost may fall rapidly.
- When the implementation cost of RE policy is to be recovered from the electricity users as the FIT surcharge, considering its regressivity, it is necessary to consider measures that include exemption for households below a certain level of power consumption.
- While cost measures are important, for the purpose of expanding the use of RE whose costs are currently high, it is essentially important to secure and maintain the stability of the policy in order to reduce the investment risks. Long term stability is particularly important when investing in asset specific developments. For that reason, uncertainty of the policy must be minimal, and retroactive change in the system needs to be refrained from. In order to ensure the stability of the investment environment, the measures adopted in Europe would be informative, where linkage between the RE power selling price and the market price was maintained at a high level and yet the long-term power purchase agreement (PPA) is stipulated.
- At the same time, to avoid over-subsidy of RE, it is effective to share the vision of RE expansion in the long run, by clearly indicating in advance the conditions and schedule of reducing the support level based on certain criteria such as upper limit in the RE volume introduced in a certain period of time and by setting the prospect of system change (“exit strategy”; e.g., from FIT to FIP).
- When subsidy is granted for the electricity tariff, there is a concern that the support to RE will distort power market (the market mechanism not functioning properly, or sending wrong price signals) and excessive support will put a cost burden on the government. Therefore, discussions to rationalize the subsidy are required.
- Initiatives must also be taken on obstacles other than financial incentives (e.g., lack of human resources, complicated regulations and procedures), with learning from best practices in other countries (e.g., acceleration of licensing procedures in

Germany by specifying the development promotion zones (zoning) by local governments).

- Along with the increase in variable RE, measures to stabilize the electricity grid will become necessary, while maintaining the high degree of reliability demanded by consumers. It is important to consider how to bear those costs including grid operation measures and/or expansion of grid infrastructure in line with the expansion of RE generation. At the same time, it is desirable to optimize system reinforcement and/or the construction of backup power sources. Thus, comprehensive policy framework will be needed that would oversee the grid system and other related policy areas such as smart communities, demand response, innovative storage technologies, etc. with an aim to increase the supply of RE that would match the generation portfolio and electricity demand.
- An EAS region based forward looking technology think tank specializing in trends in renewable energy production technology and costs can help drive an anticipatory renewable energy policy. For example, the costs of solar PV production that have been bid by First Solar in the US are for US$0.04 per kWh in the 2nd Quarter of 2015. Tracking the progress of President Obama's Sunshot initiative will also provide a sense of the future trendline in production costs. Trends in new RE technologies such as wave power and tidal power can also be analyzed, - for example, tracking new patents issued, and new trial projects being implemented in different parts of the world.
- An information network among EAS countries should be established and maintained to enable sharing of knowledge and findings on RE policy above and promotion of best practices.

Annex:

Australia

a) Electric Power Industry[6]

(Electricity tariff)

Year	NSW		Victoria		South Australia		Tasmania		Queensland	
	Residential	Business	Res	Bus	Res	Bus	Res	Bus	Res	Bus
2000/01	13.82	10.35	15.13	12.18	18.04	12.70	16.61	6.35	14.41	12.02
2001/02	13.49	11.05	16.39	14.21	18.07	14.82	16.09	6.36	14.47	11.04
2002/03	13.53	9.70	16.45	11.36	20.49	14.02	16.24	6.50	14.50	10.56
2003/04	13.57	9.80	16.06	11.47	22.66	14.16	16.40	6.57	14.76	10.66
2004/05	14.38	9.32	15.62	10.90	21.85	13.46	16.39	6.24	14.78	10.14
2005/06	14.92	9.35	15.15	10.94	20.45	13.51	16.28	6.27	14.91	10.17
2006/07	15.32	9.13	14.90	10.68	20.39	13.18	16.43	6.12	15.01	9.93
2007/08	15.93	9.65	15.76	11.30	20.54	13.95	17.21	6.47	16.20	10.50
2008/09	16.84	10.22	17.30	11.96	21.44	14.76	18.37	6.85	17.02	11.12
2009/10	20.02	10.76	19.54	12.59	21.90	15.54	18.97	7.21	19.21	11.70
2010/11	21.17	11.66	21.83	13.64	23.82	16.84	20.42	7.81	21.06	12.68
2011/12	23.82	12.35	23.22	14.45	28.45	17.84	23.06	8.28	21.79	13.43
2012/13	27.62	14.73	27.64	17.24	32.46	21.28	24.96	9.88	24.16	16.03
2013/14	28.01	16.01	28.07	18.98	31.78	20.72	24.08	9.16	27.93	17.24

- Power generation and retail sectors are liberalized.
- 5 transmission business operators regionally monopolize. In the National Electricity Market (NEM), the transmission networks are regulated monopolies. The Queensland, NSW and Tasmanian networks are all government owned. All transmission networks in Victoria and South Australia, and three interconnectors (Directlink, Murraylink and Basslink) are privately owned.

b) Subsidy for electricity tariff[7]

- The tariff for the generation sector is determined by the spot market, and an upper limit is specified for the feeding price used for calculating the spot price.
- In the NEM, wholesale trading in electricity is conducted as a spot market where supply and demand are instantaneously matched. Generators offer to supply the

[6] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014
[7] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014

market with specific amounts of electricity within a price range set under the National Electricity Rules. The spot price may vary between the maximum spot price of $13,500/MWh, the 'Market Price Cap', and a price floor of minus $1,000/MWh, the 'Market Floor Price'.

c) Current status and challenges of RE policy

(System currently implemented)

- The introduction of Feed in tariffs (FiTs) in Australia followed the National Principles for Feed-in Tariff Schemes issued by the Council of Australian Governments (COAG) in 2008. The primary aim of FiTs is to encourage the adoption of renewable energy. FiTs also encourage electricity consumers to become more energy-efficient. The majority of contracts in Australia are for a fixed term, up to twenty years in some cases, and for either gross or net metering.
- The core of the Federal RE policy is the Renewable Energy Target (RET) scheme. This scheme consolidated the existing RE systems in the states and Northern Territory and secured the RE certificate trading market, based on the Mandatory Renewable Energy Target (MRET). The MRET was introduced in 2001 to raise the additional RE power to 9,500 GWh by 2010. In 2009, a bill was passed to achieve a 20% share (45,000 GWh) of RE in all power generation by 2020. On 26 February, 2010, the Minister for Climate Change announced that the RE target would be differentiated for large-scale and small-scale systems from 1 January, 2011. The small-scale systems are subject to assistance, where the upper limit was not specified. Meanwhile, for large-scale systems, the Large-scale Renewable Energy Target (LRET) to 2030 was formulated. The LRET to 2030 was specified to be 41,000 GWh. Amending legislation to implement changes to the RET was agreed to by the Australian Parliament on 23 June 2015. A new target for the LRET of 33,000 GWh to 2030 has been specified.

(Result)

- Since RET is a Government target, it is mandatory on the electricity suppliers to meet the target each year. Since its inception, the target has been achieved in Australia.

(cost sharing)

- Feed-in tariffs (FIT) are a payment to producers of renewable energy supplied to the electrify grid. In Australia, FIT payments provided financial incentives to encourage take-up of distributed generation systems operating on renewable energy sources. FiTs have been implemented in every state in Australia.
- Eligibility for a FiT depends on the requirements of the scheme in each state and

territory, including for system capacity and renewable energy sources. The ACT and New South Wales have gross feed-in tariffs. Other State Governments have enacted net feed-in tariff schemes.

- In addition, Small-scale Technology Certificates (STCs) provide a financial incentive to eligible households for installation of rooftop solar PV. STCs are a sort of renewable energy currency created under auspices of the Renewable Energy Target (RET) scheme. The value of the STC represents an up-front discount for those who purchase solar systems for their homes or businesses.

Brunei Darussalam (review not received)

a) Electric Power Industry

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*

b) Subsidy for electricity tariff

c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- "Energy White Paper" issued in March 2013 held up a target to raise the RE generation rate to 10% by 2035, and to raise the generation amount from the current 1.7 GWh to 124 GWh by 2017 and to 954 GWh by 2035.
- *Description of the current introduction results and effects*
- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

Cambodia (review not received)

a) Electric Power Industry

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*

b) Subsidy for electricity tariff

c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- Aiming at promotion of power generation by RE, in May 2003, the Renewable Energy Action Plan 2002-2012 (REAP) was formulated supported by the World Bank. A target to raise the RE energy generation capacity to 6,000 kW was set.
- The specific introduction schedule or political measures were not specified for the target, and the implementation results are not disclosed.
- Meanwhile, the government approved the Rural Electrification by Renewable Energy Policy in 2006 to expand the electricity access. The Policy included achievement of 100% electrification for rural areas by 2020, supplying grid-quality electricity for 70% of households by 2030, etc.
- *Description of the current introduction results and effects*
- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

China (review not received)

a) Electric Power Industry[8]

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*
- The generation sector consists of 5 major generation (central) companies, other central companies, local public generation companies, etc. Two national companies are in charge of the transmission and distribution business.

b) Subsidy for electricity tariff[9]

- Both the wholesale electricity tariff and the retail electricity tariff are specified for each Province, approved by the government.

c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- The "Renewable Energy Law" was formulated in January 1, 2006. The Law obligates power transmission companies to purchase all the RE generation amount at the specified purchasing price.
  - *Describe the purchase price:*
- Along with the revision of the Renewable Energy Law (December 2009), the "Renewable Energy Development Fund" was established. The Fund consists of allocation of special funds of the national finance and RE premium added onto the electricity tariff, and is to take the burden of purchasing RE electricity.
- In the RE electricity purchase system, the purchase price is determined through bidding at the initial stage, and the governmental purchase price is determined after gaining information by introducing a certain amount.
- For the PV generation, the nation-wide purchase price was specified in July 2011. However, due to the system reform in August 2013, new purchase prices were specified for large-scale PV power stations by region depending on the amount of resources. The purchase price for PV power stations established at regions with the best sunshine condition (Class I Resource District) was specified to be 0.9 yuan/kWh (11.3 yen/kWh), that at regions with the next best sunshine condition (Class II Resource District) to be 0.95 yuan/kWh (11.9 yen/kWh), and that at other regions (Class III Resource District) to be 1 yuan/kWh (12.5 yen/kWh). These prices are still applicable.
- Along with the review of the PV electricity purchase price, the standards for aiding

[8] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014
[9] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014

distributed PV generation were also specified. Power transmission companies are able to purchase the surplus electricity generated by distributed PV generation systems at the price standards for the local coal-fired thermal generation, and to receive the subsidy of 0.42 yuan/kWh (5.25 yen/kWh) from the government for the entire generation amount. Some local governments also grant aid for PV generation, especially for distributed PV generation, in addition to the aid by the central government.

- ➢ *Describe the specific amount of subsidies:*

- Expanded introduction of RE has become an important political challenge also as a measure against the air pollution that has become a serious issue. On September 12, 2013, China's State Council released its "Action Plan for Air Pollution Prevention and Control", which stipulates targets to reduce the share of coal in the energy consumption to 65% and to raise the rate of non-fossil fuel to 13% by 2017.
- *Description of the current introduction results and effects*
- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

India (review not received)

a) Electric Power Industry[10]

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*
- The central sector is in charge of power generation and transmission across states, and state governments take charge of power generation, transmission and distribution business within the state. The state supply system varies depending on the state; the system is liberalized in some states, and an integrated system is adopted in some other states.

b) Subsidy for electricity tariff[11]

- The tariff system varies depending on the state.
- Retail prices are below the supply cost. The retail prices for agricultural use are set at substantially low values.
- There is subsidy for the agricultural sector, domestic sector and cross-state sales. Additionally, there are subsidy by the state governments and internal aid by electricity business operators.

c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- Regarding interconnected RE, as the introduction target by source from April 2011 to March 2017 including the period of the 12th Five Year Plan (December 2012), it was specified to increase the RE power plant capacity from the current 25,000 MW to 30,000 MW.
- For PV generation, the target is to introduce 20 GW by 2022, and it was determined to purchase 1 GW in the first stage (up to March 2013) and 3 GW in the second stage (total of 4 GW) through the Renewable Purchase Obligation (RPO) imposed on power companies.
- Through RPO, electricity regulatory commission in 21 states imposes 1-10% of the obligatory purchase rate onto licensed power distributors. In 2009, guidelines for formulating an FIT system were issued to each state, specifying; (1) All renewable electricity technologies are the target. (2) The purchase prices are effective for 13 years, excluding:
- PV and solar heat: 25 years, small-scale hydropower (5MW or less): 35 years. (3) Electricity regulation authority of each state is to determine the final purchase

[10] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014
[11] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014

price. (4) The purchase prices of PV and solar heat power general shall be reviewed every year, and that of other RE electricity every 3 years.

- The Central Electricity Regulatory Commission (CERC) also issued guidelines on FIT purchase prices, but the actual purchase prices are freely determined by each state.
  - *Purchase price:*
- *Description of the current introduction results and effects*
- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

Indonesia (review not received)

a) Electric Power Industry[12]

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*
- The generation sector is occupied by PLN (the government holds a 100% share), its subsidiaries and IPPs, and the power transmission and distribution sector are monopolized by PLN.
- Power generation by IPPs is all purchased by PLN through competitive bidding, while PLN can directly designate for RE electricity without going through bidding.

b) Subsidy for electricity tariff[13]

- The government aids PLN.

c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- On October 17, 2014, the "2014 National Energy Policy" was formulated. The target rate of new and renewable energy (nuclear, hydrogen, coal bed methane, liquefied coal and gasified coal) was specified to be 23% by 2025 and 31% by 2050.
- Policies for purchasing RE, etc., are as below:
  - Small Distributed Power Generation Scheme for Renewable Energy (Ministry of Energy and Mineral Resources (MoEMR) Decree: No.1122 K/30/MEM/2002): Preferential purchase price by PLN is applied to business with the RE electric power plant capacity of 1 MW or less. The actual purchase price is determined through negotiation with PLN.
    - *Purchase price:*
  - Medium Scale Power Generation Scheme for Renewable Energy (MoEMR Regulation No.002/2006): Preferential purchase price by PLN is applied to business with the RE electric power plant capacity of 1-10 MW for 10 years. The actual purchase price is determined through negotiation with PLN.
    - *Purchase price:*
  - Tariffs by PLN for Small and Medium Scale Power Generation (10 MW) using Renewable Energy (MoEMR Regulation No.31/2009): It stipulates that PLN is obliged to purchase all RE electricity except geothermal generation at a certain price.
    - *Purchase price:*

[12] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014
[13] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014

- Purchase obligation of geothermal generation electricity at bidding price (MoEMR Regulation No.32/2009): Came into force on December 4, 2009. It is a supportive policy to achieve the geothermal development target held up by PLN's Electricity Power Supply Business Plan (RUPTL). PLN is obligated to purchase geothermal generation electricity at the price determined at the time of bidding (with an upper limit of US$0.097/kWh; post facto price negotiation is not accepted). PLN also standardizes the process of power purchase agreement (PPA).
- Electricity Purchase from Small and Medium Scale Renewable Energy and Excess Power (MoEMR Regulation No.4/2012): PLN is obliged to purchase electricity of small- and medium-scale RE generation facilities with 10 MW or less and excess power. The purchase prices are determined based on the interlinking cost to the medium- and low-voltage transmission lines at each region, and price negotiation is not accepted. Special purchase prices are specified for urban recycled resources such as biogas, biomass, landfill gas, and urban refuse.
    - *Purchase price:*

- *Description of the current introduction results and effects*
- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

Japan

a) Electric Power Industry

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*
- Japanese electricity business operators include general electric utilities, wholesale electric utilities, independent power producers (IPPs), special scale electric utilities, and specified electric utilities. General electric utilities refer to business operators who take charge of power generation, transmission and distribution to general consumers in an integrated manner, and there are 10 regional companies. The power system used to be regionally monopolized by general electric utilities, which was then liberalized since 1995 in steps starting with liberalization of the generation sector and partial liberalization of the retail sector. In 2016, the retail sector will be fully liberalized through the second revision of the Electricity Business Act (June 2014). Through the third revision of the Electricity Business Act (bill passed the House of Representatives in May 2015), the power transmission and distribution sector is to be separated by 2018.

b) Subsidy for electricity tariff

c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- FIT was introduced in July 2012. RPS was introduced before FIT. (Describe the detailed period, specific measures and the effects in the notes)
- Introduction of PV generation rapidly increased in recent years. There was the introduction of an additional 15.82 million kW by the end of December 2014, and the authorized facility capacity including facilities that underwent authorization (those where FIT application price is determined yet the operation has not been started) has reached 74 million kW. Meanwhile, introduction of RE power supply other than PV is stagnant.
- The purchase cost for FIT amounted to 1.8 trillion yen in FY2015, and the unit surcharge price to users soared from 0.22 yen/kWh (monthly burden on average household: 66 yen) to 1.58 yen/kWh (474 yen). The purchase cost of RE electricity excluding authorized facility capacity of facilities that are unlikely to become operable is estimated to be 2.2 trillion yen per year, and the cumulative total for the purchase period may amount 50 trillion yen.
- The national government has presented a plan to make the share of RE electricity

in the energy mix to be 22-24% in 2030, and is aiming at raising the total share of geothermal, biomass and hydropower to 15%. The challenge is to promote cost effective development of power sources other than PV amid the situation of soaring purchase cost of PV electricity.

- *Description of the current introduction results and effects*
- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

Korea

a) Electric Power Industry[14]

(Electricity tariff)

- Residential use 127Won/kWh, industrial use 101/kWh
- The generation sector consists of six power generation subsidiaries of KEPCO (the government holds 51% of shares) and IPPs, and KEPCO is in charge of the power transmission/distribution and power retail.

b) Subsidy for electricity tariff[15]

- Electricity tariff of KEPCO is the same throughout the country. Revision of the tariff requires approval by the government.
- Due to the deficit of KEPCO associated with increased supply cost, introduction of a fuel cost adjustment system is under consideration.

c) Current status and challenges of RE policy

(System currently implemented)

- "Energy Basic Plan" was formulated in January 2014.
- The plan is to expand the share of new and renewable energy (RE and new energy: fuel cell, hydrogen, and coal liquefaction/gasification) in the primary energy supply up to 11% by 2035.
- Replacing FIT (2002-2011), RPS was introduced in 2012. While the RE surcharge of FIT used to be covered by the government budget instead of price pass-through to the electricity tariff, the burden increased and the system was being sunset.
- The companies subject to RPS are 13 energy companies with generation facilities of 500,000 kW or larger (excluding RE sources), and the target was started with 2% in 2012 which is to be increased at a rate of 0.5% a year by 2016 and thereafter at a rate of 1% a year to reach 10% by 2022.
- Weighted RECs (Renewable Energy Credits) are adopted for counting the mandatory amount. For instance, power generation of 1 kWh by fuel cell is counted as 2 kWh in RPS.
- Since the introduction of RPS, many of the obliged business entities were unable to observe RPS allocated to them and ended up with borrowing or pay penalties. Hence, discussions are currently underway to postpone the aforementioned target (10% by 2022) by 2 years, and there arose a necessity to review the appropriateness of target setting.

[14] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014
[15] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014

Lao PDR

a) Electric Power Industry

(Electricity tariff)

- Domestic sector 0.042$/kWh, Industrial sector 0.092$/kWh

b) Subsidy for electricity tariff

- For small consumers (residential), industries and agriculture

c) Current status and challenges of RE policy

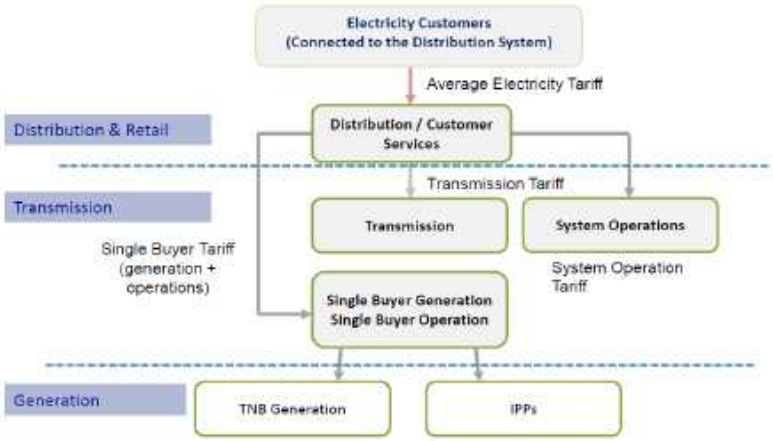
(System currently implemented)

- None of the approaches has been implemented yet as RE policies are under drafting process
- The "Renewable Energy Development Strategy" announced in October 2011 specified the ratio of introduced RE to the overall energy consumption to be 30% by 2025, focusing on hydropower and bio fuel (10% to reduce fossil fuel import).
- The policy is to promote introduction of RE integrated with the local electrification policy, and construction of power systems and introduction of distributed RE power sources will be promoted simultaneously.
- In the local electrification policy, the target is to achieve a 90% national average electrification rate by 2020. To facilitate the introduction of distributed power sources, the Law on Electricity (effective since 1997) ensures the freedom of entry of small power generation business operators with 15,000 kW or less by the judgment of local governments.
- As Laos does not have RE policies yet, key domestic challenges and constraints on RE development will be
  - No specific policies or strategies on RE promotion
  - Lack of coordination between stakeholders in renewable energy
  - RE policy has not yet been clearly stated in the National Socioeconomic Development Plan
  - Lack of specific regulations and laws on RE
  - It was not clear yet, who is responsible for RE project approval
  - Users have insufficient knowledge and understanding on RE
  - Lack of public funding support on RE
  - Absence of energy pricing regulation is a risk for investors
  - Rural households prefer grid electricity rather than off-grid one
  - Insufficient information on RE potential for provincial level
  - Electricity access rate in remote areas is still low
- Further reference: http://www.edl.com.la/en/page.php?post_id=6

Malaysia (review not received)

a) Electric Power Industry

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*
- Vertically integrated by geographic location
- Single buyer model



(Source) Dr. Romeo Pacudan, ERIN WS, 20 April 2015

b) Subsidy for electricity tariff

- Power fuel suppliers (piped gas, LNG and coal) are subsidized

c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- The 10th Malaysia Plan 2011-2015 formulated the "Malaysian National Renewable Energy Policy and Action Plan", targeting to achieve the RE electricity share of 9% by 2020 and 13% by 2050, where FIT is placed as the main promotion program.
- A depletion rate is specified for the purchase price of FIT, and the 6-monthly upper limit (RE Quota) is specified for the generation facility introduction amount by technology sector. Through these, the annual cost burden can be fixed, and the increase in the introduction cost will be controlled.
- The additional cost for introducing RE will be passed onto the electricity users, and customers with the monthly electricity charge of RM 77 (Ringgit) or more will be charged an additional 1% to the monthly electricity charge. The Sustainable Energy Development Authority (SEDA) operates the fund collected through the electricity tariff as RE fund, performs bidding of RE Quota, and takes charge of management and supervision of FIT implementation.
- *Description of the current introduction results and effects*

- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

Myanmar

a) Electric Power Industry

(Electricity tariff)

- Myanmar currently uses Capacity Basis Tariff.

	Units	Kyats
Household	Below 100	35
	101 to 200	40
	Over 201	50
Industrial	Below 500	75
	501 to 10,000	100
	10,001 to 50,000	125
	50,001 to 200,000	150
	200,001 to 300,000	125
	3200,001 and above	100

b) Subsidy for electricity tariff

- The new tariff system helps the Ministry of Electric Power (MOEP) to remove the subsidy in the power sector and currently the subsidy is standing at the breakeven point.

c) Current status and challenges of RE policy

(System currently implemented)

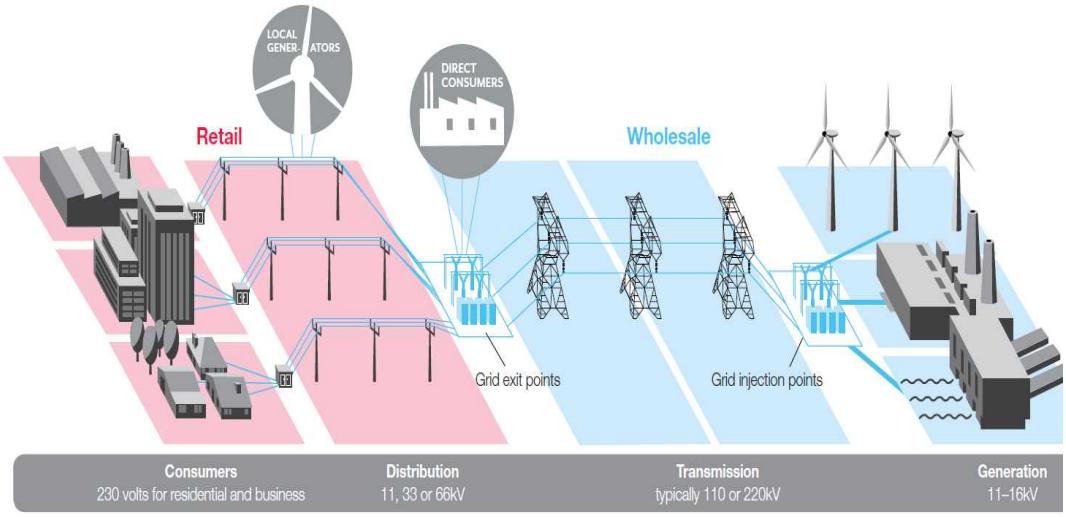
- To strengthen the rules and regulation in power sector, Ministry of Electric Power (MOEP) enacted the new Electricity Law and continues drafting the Electricity Regulation. After this stage, MOEP will proceed to formulate the necessary law, rules and regulation (IPP, SPP, VSPP, FIT, etc…).
- MOEP has drafted National Electricity Master Plan by coordinating with Japan International Cooperation Agency (JICA). And the MOEP is processing to get the approval from the Government. According to National Electricity Master Plan, the contribution of Renewable Energy in power generation mix is 9% in 2030 and the capacity of 2000MW.
- The Ministry of Energy places hydropower generation as an important source of energy in its energy policy, and presents policies to promote development of small-scale hydropower. However, specific preferential treatment or aiding measures have not been implemented.
- In order to promote the development of small-scale hydropower, MOEP developed a new process, under this, the private sector can build and operate small and medium hydro power plant with the approval of regional governments.

New Zealand

a) Electric Power Industry

(*Electricity tariff)*

- Renewable resources contribute to over 70% of New Zealand's electricity supply. This outcome is achieved without subsidies or financial support. Government policy has set a target of generating 90% of electricity from low carbon sources by 2025. This target is achievable if projects already consented proceed (Suomalainen and Sharp, 2015).
- The structure of New Zealand's power industry is shown below. A wholesale electricity market began operating in 1996 with competitive bidding among generators at approximately 250 grid entry points throughout the country. Transmission is undertaken by a natural monopoly to grid exit points to supply the retail market. Competition in the retail market has increased in recent years with the entry of power switching.



Source: Electricity Authority 2011

- *Electricity tariff in real NZc/kWh (2015)*

	2005	*2015*
Residential	*22.43*	*28.86*
Commercial	*16.25*	*16.91*
Industrial	*11.07*	*12.06*

Note: Residential tariff includes 15% GST.

b) Subsidy for electricity tariff

- There are no subsidies to electricity production and consumption. Market operations are monitored and regulation is light handed.

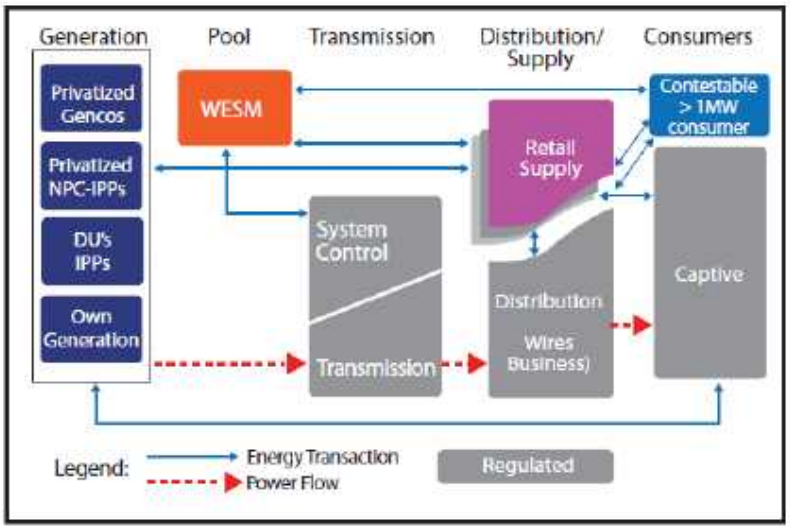
c) Current status and challenges of RE policy

- Institutional reforms and renewable policies have supported the widespread deployment of competitive renewable energy technologies.
- Further developments, at the generation and retail level, will be conditioned by market forces. The development of renewable sources will continue, provided they meet commercial criteria.
- Domestic sources of gas will continue to play an important role in security of supply.
- Already consented low-carbon electricity projects offer roughly enough energy to meet the 90% renewables target by 2025.

The Philippines (review not received)

a) Electric Power Industry

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*
- Wholesale and retail competition



(Source) Dr. Romeo Pacudan, ERIN WS, 20 April 2015

b) Subsidy for electricity tariff

- Power fuel suppliers are not subsidized

c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- "Philippine Energy Plan 2012-2030" was formulated in December 2012, specifying RE to be 32.6% by 2030 under the BAU scenario and 37% for the case of low carbonization.
- The Renewable Energy Act of 2008 stipulated introduction of FIT. The purchase prices were specified in July 2012, and it was decided to implement it officially.
  - *Purchase price:*
- It is stipulated that FIT is jointly used with the RPS Rules, and the specific implementation method is yet to be determined. Additionally, FIT has some problems to be solved, for instance, the actual timing for applying tariff to business operators is not determined, guidelines on payment are unknown, and there is a major discrepancy between the supply/demand amount at the power retail spot market and the target of the RE introduction plan.
- *Description of the current introduction results and effects*

- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

Singapore (review not received)

a) Electric Power Industry

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*

b) Subsidy for electricity tariff

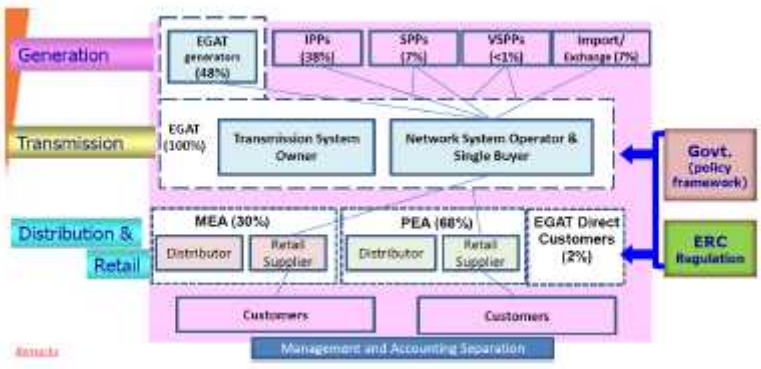
c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- While specific targets for introducing new and renewable energy have not been formulated, financial support is provided for establishment of PV generators and technology development for developing the clean energy industries (e.g., EVs, smart grid, biomass, fuel cell, bio fuel).
- Example: Clean Energy Research Programme (CERP): A program to support R&D initiatives in the RE industry with the total amount of 50.7 million SGD for 5 years from 2007. Research projects proposed by the laboratories of companies and universities etc. were selected through bidding. Projects on PV generation technologies are the main focus.
- *Description of the current introduction results and effects*
- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

Thailand (review not received)

a) Electric Power Industry

- *Electricity tariff: Domestic sector X$/kWh, Industrial sector X$/kWh*
- Vertically integrated in generation and transmission
- Single buyer model



(Source) Dr. Romeo Pacudan, ERIN WS, 20 April 2015

b) Subsidy for electricity tariff

- Rural area customers are cross-subsidized by urban area customers
  - *Subsidy amount:*

c) Current status and challenges of RE policy

- *System currently implemented: Exhibit those that apply from RPS, FIT, FIP, bidding system, net metering, etc., describe the existence of facility subsidy and the possibility of its joint use with policy (e.g., FIT), and describe the details below:*
- A target to raise the RE ratio in the final energy consumption to 25% by 2021 was established. The "Alternative Energy Development Plan" (AEDP-Master Plan 2012-2021) was announced (July 2013), where the target of RE electric power plant capacity was set to be 13,927 MW.
- A program to purchase electricity from small power producers (SPPs, 10-90 MW) started in 1994, and that from very small power producers (VSPPs, 10 MW or less) started in 2002. Based on these, in April 2007, the Adder program was introduced, where the purchase prices and the period were fixed by adding a premium on the purchase prices of SPP and VSPP programs. Through revisions of the premium, the premium price and the purchase prices from SPP and VSPP were consolidated since the end of 2011, and transition to the Feed-in Tariff system was announced. Specific system design is a pending issue.
- *Description of the current introduction results and effects*

- *If financial aid is provided for introduction (e.g., FIT), the cost sharing method*

Vietnam

a) Electric Power Industry[16]

(Electricity tariff)

- The latest electricity tariff of Vietnam is promulgated by the Ministry of Industry and Trade in Decision No. 2256/QD-BCT dated 12/3/2015 and is applicable from 16/3/2015. According to this decision, the average retail tariff is 1,622.01 VND/kWh, or 7.56 US cents/kWh.
- The electricity tariff is divided into retail tariff and wholesale tariff, which are then further divided into groups of customers, voltage levels, consumption levels, peak – off-peak hours. Following is the summary of the electricity tariff.

ELECTRICITY TARIFF OF VIETNAM (FROM 16/03/2015)		
No.	*Group of customers*	*Tariff range*
Retail Tariff		
1	*Manufacturers*	*4.05 – 12.75 US cents /kWh*
2	*Administrative and non-profit units*	*6.8 – 7.8 US cents/kWh*
3	*Businesses*	*5.5-18.6 US cents/kWh*
4	*Electricity for living*	*6.9 – 12.1 US cents/kWh*
Wholesale tariff		
1	*Rural areas*	*5.7 – 9.5 US*
2	*Residential blocks or clusters*	*6.1-11.1 US cents/kWh*
3	*Commercial – Service – Residential complexes*	*6.2-17.6 US cents/kWh*
4	*Industrial zones*	*At 110kV busbar: 3.8-11.2 US cents/kWh* *At medium-voltage side of the substation: 4.1 – 12.1 US cents/kWh*

- EVN group, established as a national company in 1995, owns and manages main power plants, load-dispatching offices, transmission companies, distribution companies, etc. A Power development plan, reform proposal for electricity tariff, etc. were formulated and implemented.

[16] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014

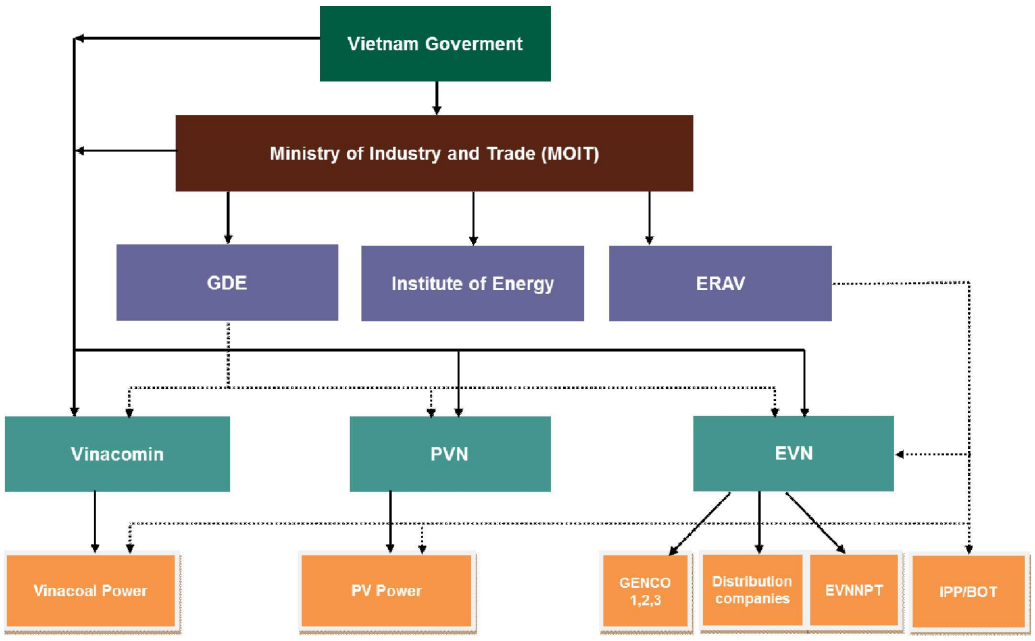


Figure: The organizational structure of power industry in Vietnam

- The National Power Development Plan (Master Plan - PDP) is developed every five year by the Institute of Energy and approved and promulgated by the Prime Minister. This is the power development plan for the next 10 years with outlook to the subsequent period of 10 to 20 years ahead, and is the orientation document for the development of power industry in Vietnam. The current PDP is PDP VII and a revised PDP VII is now under preparation and approval period.
- The power market of Vietnam is now in competitive generation market stage, and is preparing for the pilot stage of electricity wholesale market.

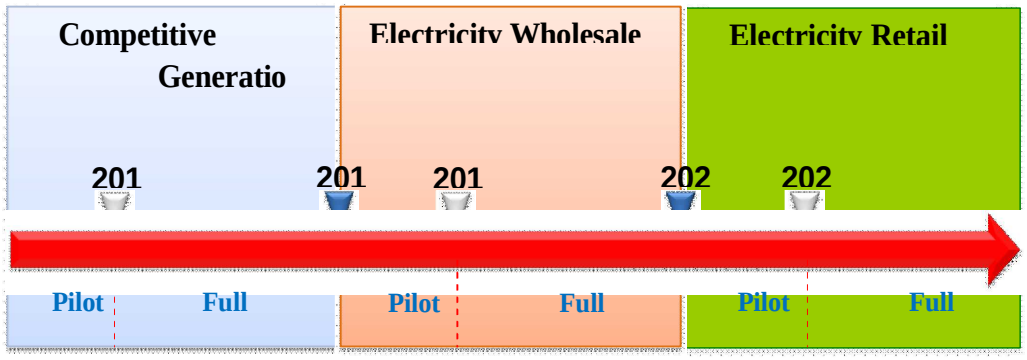


Figure: Vietnam Power market development roadmap

- Electricity tariff is regulated by Ministry of Industry and Trade, The current price

is low and does not cover the actual cost, causing pressure for EVN in financing the development of the power system.

b) Subsidy for electricity tariff[17]

- Retail prices are the same throughout the country.
- Electricity prices are regulated, albeit less rigidly than before. As of April 2011, EVN was allowed to adjust electricity prices by up to 5 per cent every 3 months according to changes in production costs, while retail price adjustment over 5 per cent require the approval of the Ministry of Finance (MOF) and the Ministry of Industry and Trade (MOIT). According to latest regulation, EVN is allowed to adjust electricity prices by 7 to 10 per cent every 6 months under a regulated pricing framework and in line with changes in production costs, with approval of MOIT. Retail price adjustment over 10 per cent or beyond the framework requires the approval of the MOF and the MOIT.

c) Current status and challenges of RE policy

(System currently implemented)

In order to support renewable energy projects, MOIT issued a regulation on the avoided cost- based tariff and standard power sale contract applicable to small power plants that use renewable energy. The avoided cost-based tariff is set on the basis of the avoidable cost on the national power system when 1 kWh is generated from the small power plant to the power distribution grid. The avoided cost tariff will be calculated by the seasons and published annually.

For wind energy, the government of Viet Nam has approved Fit-In Tariff (FIT). The FIT is equal to 7.8 US cents/KWh and Electricity of Viet Nam (EVN) is responsible for purchasing all electricity from wind power plants with contract period of 20 years with possible extension or renewal.

The supporting mechanism for biomass power projects is promulgated in 2014. According to this decision, EVN is responsible for purchasing all electricity generation from on-grid biomass power plants with contract period of 20 years with potential extension or renewal. The FIT applied to power-thermal co-generation biomass plants is 5.8 Uscent/kWh. For on-grid biomass power plants other than power-thermal co-generation plants, the power purchase price is according to the avoided-cost based tariff for biomass power projects promulgated by MOIT annually. Besides, all on-grid and off-grid biomass power plants also benefit from other incentives such as investment credit incentives from the State, exemption from import tax for equipment and materials not yet produced locally, discount on corporate income tax, exemption and

[17] The Electric Power Industry in the World, Japan Electric Power Information Center, Inc., 2014

reduction on land use levy and fee.

- The supporting mechanism for on-grid power generation from solid waste projects is promulgated in 2014. Similarly to the regulations on wind and biomass power projects, EVN is required to purchase all power generation from on-grid solid waste power plants with contract period of 20 years with possible extension or renewal. Waste to power projects also benefit from other incentives on investment credit, import tax exemption, corporate income tax discount, land use levy and tax exemption and reduction similarly to biomass power plants. The FIT applied for solid waste thermal power plants is 10.05 US cents/kWh, and FIT applied for power plants burning gas recovered from solid waste landfill is 7.28 US cents/kWh.
- The supporting mechanism for on-grid biogas power projects has been proposed in a study implemented by Institute of Energy with GIZ fund, but has not been approved yet by the Prime Minister.
- The revised "PDP VII" specified a target to raise the ratio of installed capacity of RE from 3.5% in 2010 to 6.3 % by 2020, to 8.1 % by 2025 and to 10.1 % by 2030.
- The amount and distribution of resources are not investigated minutely, and legal development etc. is required. The use of RE is placed as an immediate measure for realizing local electrification and against the poverty; commercial introduction is considered difficult.

(Results)

- The mechanism on avoided cost tariff seems to be effect on development of SHP. Currently, there are around 157 SHP projects with total capacity of 1,269,4 MW being in operation and 163 SHP projects with total capacity of 1,683.0 MW are under construction. Moreover, there are above 260 SHP projects with total capacity of 2,028.2 MW are preparing for investment report and 127 SHP projects with total capacity of 660.7 MW are under planning period (Statistic Data, 2012, General Directorate of Energy, MOIT)
- For the wind power, as of the end of July 2014, there were 52 wind power projects in Vietnam with a total power capacity of 4,452 MW, and all were located in the central and southern provinces. Three are already in operation with a total installed wind power capacity of 52 MW. The rest are in various stages of development, e.g., in the investment report preparation or construction stages
- The supported price for wind power is still low and the benefits from wind power project also do not compensate the investment costs and other O&M costs. So far, the first wind power project, located in Tuy Phong district, Binh Thuan province, has completed the first phase of building to be operational with the installed

capacity of 30 MW. The second project, also located on Phu Quy Island has an installed capacity of 6 MW. The third wind power project was implemented in the Mekong delta province of Bac Lieu with 16 MW has been completed and connected to the national grid in September 2013 at the first phase.

- The potential of biomass to power in Vietnam is high, but now there is only 150MW of installed capacity using bagasse for power generation mainly for own consumption of sugar plants with residual generation sold to EVN.

(Cost sharing method)

- The FIT for wind power is 7,8 US cents/kWh, of which 6,8 US cents is paid by EVN and 1 US cent is subsidized by the State through the Environment Protection Fund
- The FIT for co-generation biomass power is 5.8 US cents/kWh and is paid by EVN
- The FIT for municipal solid waste power is 10.05 US cents/kWh for incineration and 7.28 US cents/kWh for landfill and is paid by EVN.