Session II: Enabling environment: policy and regulatory frameworks

Regional Workshop on Overcoming Critical Bottlenecks to Accelerate Renewable Energy Deployment in ASEAN+6 Countries

June 15, 2016

Foundations of a policy framework

- Renewable energy policies remain the most important driver of deployment.
- An enabling policy framework should provide:
  - Long-term government commitment, and credible targets.
  - Remuneration arrangements with long term predictable revenue streams.
  - Overall stability and predictability, with built in flexibility to allow adaptation.
  - Actions to tackle non-economic barriers including streamlining planning and permitting, developing the necessary skills base and providing public information.

Types of renewable energy policies

National policy

Provides a trajectory for future evolution of the energy mix

Provides a tangible framework and enabling conditions for renewables

- Renewable Energy Target
- Renewable Energy Law / Strategy
- Biomass Law / Programme
- Biofuels Law / Programme
- Solar Heating Law / Programme
- Solar Power Law / Programme
- Wind Power Law / Programme
- Geothermal Law / Programme

Fiscal incentives

Crucial for the development of renewables, particularly considering the higher upfront cost of some technologies

- VAT Exemption
- Fuel Tax Exemption
- Income Tax Exemption
- Import / Export Fiscal Benefit
- National Exemption of Local Taxes
- Carbon Tax
- Accelerated Depreciation
- Other Fiscal Benefits

Grid Access

Provides confidence to project developers

- Grid Access
- Transmission Discount / Exemption
- Priority / Dedicated Transmission
- Preferential Dispatch

Types of renewable energy policies (Contd)

Regulatory Instruments

Provide incentive for investing in renewables

- Feed-in Tariff
- Feed-in Premium
- Auction
- Net Metering
- Quota
- Ethanol Blending Mandate
- Biodiesel Blending Mandate
- Solar Mandate
- Certificate System
- Hybrid

Finance

Crucial for financing projects and reducing risk for investors

- Currency Hedging
- Dedicated Fund
- Eligible Fund
- Guarantees
- Pre-investment Support
- Direct Funding

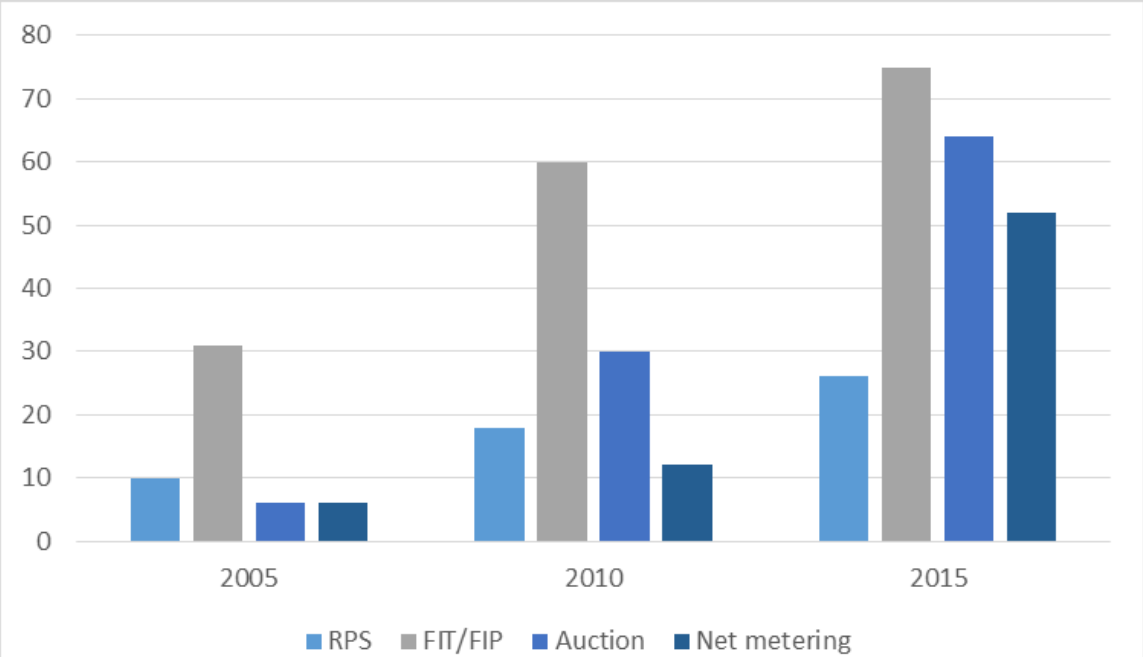
Other

Maximise socio-economic benefits

- Renewable Energy in Social Housing
- Renewable Energy in Rural Access Programmes
- Renewable Energy Cookstove Programme
- Local Content Requirements
- Special Environmental Regulations
- Food / Bioenergy Nexus
- Social Requirements

Renewable energy regulatory policies

Number of countries with renewable energy policies, by type (2005 – 2015)



Source: REN21, 2006, 2014, 2016

Moved from a feed-in tariff to auctions

Moved from auctions to a feed-in tariff

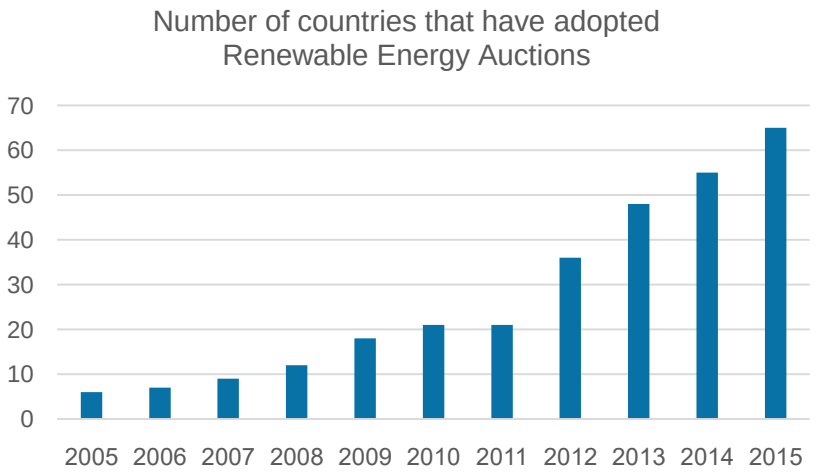
Implemented auctions and a feed-in tariff simultaneously

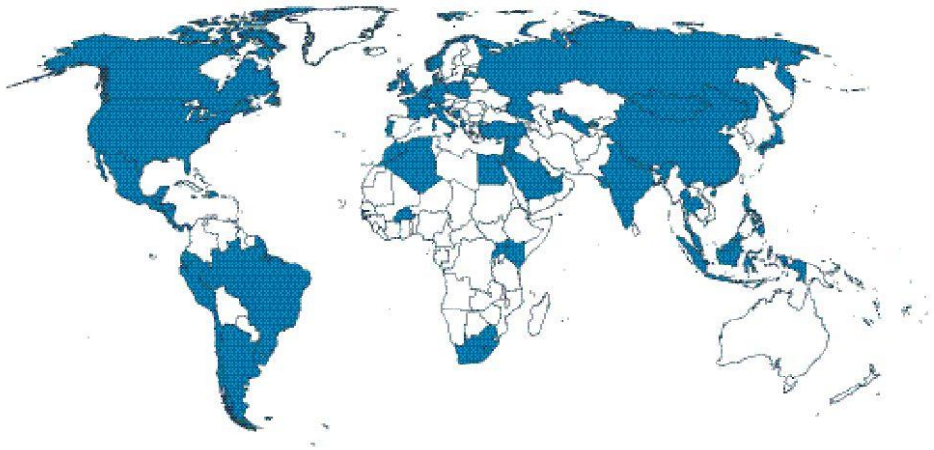
Renewable energy feed-in tariffs

- Most widely used policy instrument to support the development of renewable energy.
- Provides maximum levels of certainty in terms of project revenues from electricity generation.
- Usually reduces transaction costs and administrative processes given that tariffs are fixed.
- Drove deployment in “early adopter” countries such as Germany, Italy, Spain and the United Kingdom.
- Early challenges associated with unregulated deployment, limited cost tracking leading to over compensation, financial cost and market integration of high shares of renewables.
- Several adaptation measures introduced such as automatic degression schemes and caps on volume and costs.

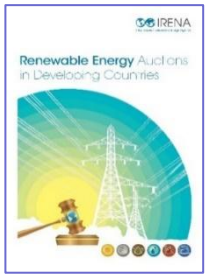
Renewable Energy Auctions

Auctions have increasingly been adopted to support renewable energy deployment

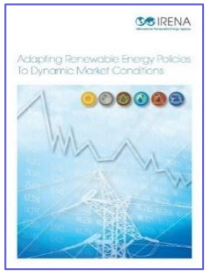




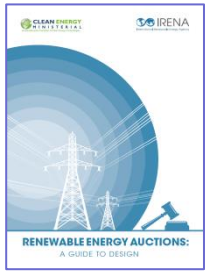
Based on REN21 Global Status Report (2005 to 2015)



2013



2014



2015

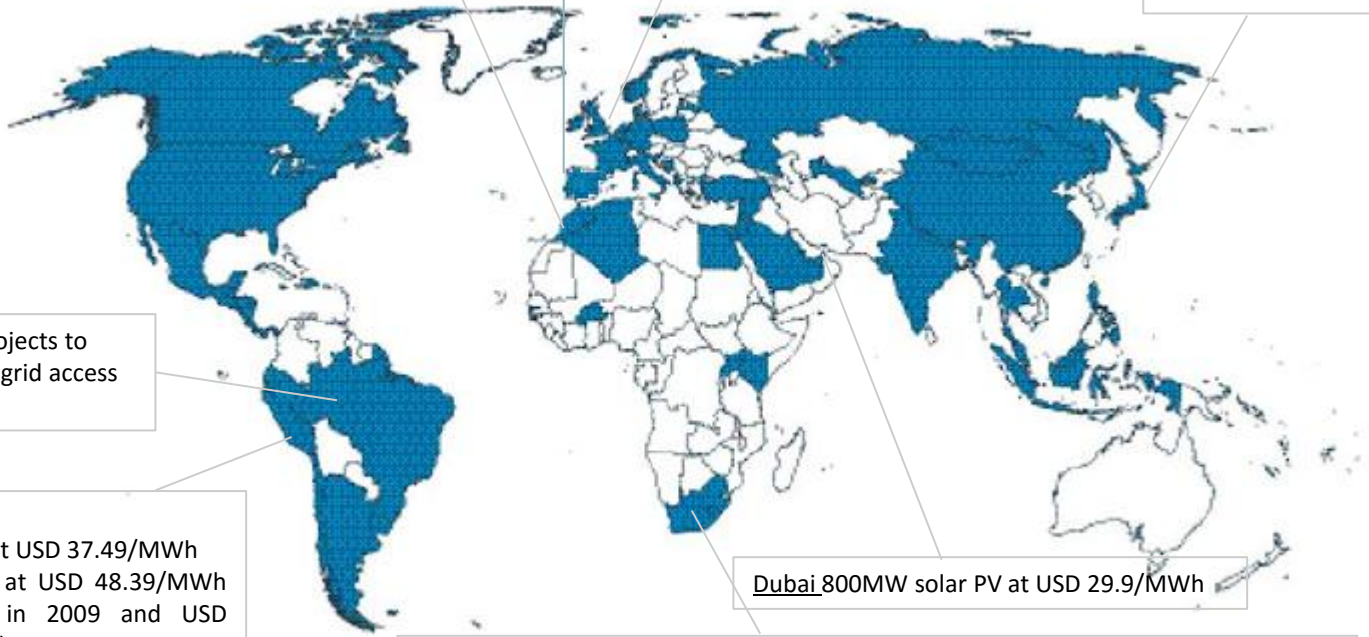
Renewable Energy Auctions - Recent highlights

Spain awarded 500 MW of wind and 200 MW of biomass with no financial incentive

Germany third round of solar PV
204 MW at 0.08 EUR/kWh (0.0849 EUR/kWh for the 2nd and 0.0917 EUR/kWh for the 1st with a cap of 150 MW)
Among the winners 3 individual investors, 2 registered cooperatives and 3 small privately held businesses

Morocco achieved a new low for wind with average bids of USD 30/MWh for 850 MW (the lowest at around USD 25/MWh)

Japan announces move to auction from FIT in 2017 to cap installations and reduce costs on consumers



Brazil mandates projects to secure guaranteed grid access prior to bidding

Peru 4th auction:
162 MW of wind at USD 37.49/MWh
184.5 MW of PV at USD 48.39/MWh
(USD 220/MWh in 2009 and USD 110/MWh in 2010)

Dubai 800MW solar PV at USD 29.9/MWh

South Africa announces 5th auction to target 1.6 GW of new capacity

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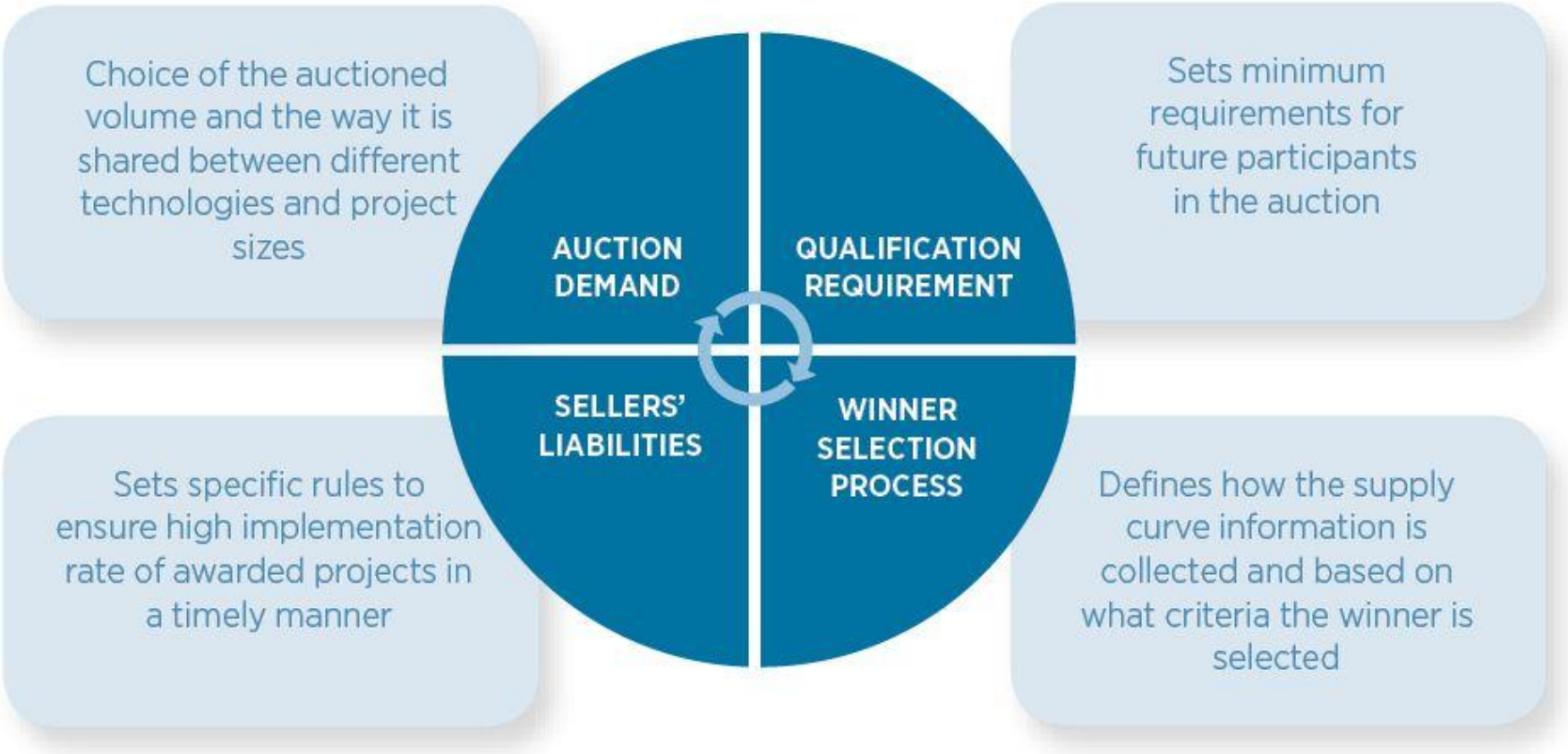
Renewable Energy Auctions – Design elements



Key considerations in designing and implementing auctions

Increasing competition for cost-efficiency

- Increased participation of bidders
- Prevention of collusion and price manipulation

Limiting participation to bidders who can meet goals

- Project delivery
- Deployment goals

Ensuring global socio-economic development goals

- Qualification requirements
- Multi-criteria selection

Strengths and weaknesses of FITs, FIPs and Auctions

	FITs	FIPs	Auctions
Strengths	Limits the risks for investors also in emerging technologies	Fixed premiums encourage generators to react to market signals	Flexibility in the design according to conditions and objectives
	Facilitates the entry of new players in the market	Sliding premiums or capped fixed premiums minimise the support cost	Permit real price discovery
	Often funded by consumers and not exposed to public budget cuts	Limit risk for investors, especially premiums with floor	Provide greater certainty regarding prices and quantities
	Long term security drives technological development	Flexible designs and well suited for liberalised electricity markets	Enable commitments and transparency
Weaknesses	Costly with high deployment rates and Generation is not exposed to electricity market prices	Fixed premiums without floor create risk for investors	Are associated with relatively high transaction costs for both developer and auctioneer
	Tariff setting and tariff adjustment process is challenging and complex	Premium setting and adjustment process is challenging and complex	Risk of underbuilding and delays

Auctions or FITs: No easy answer…

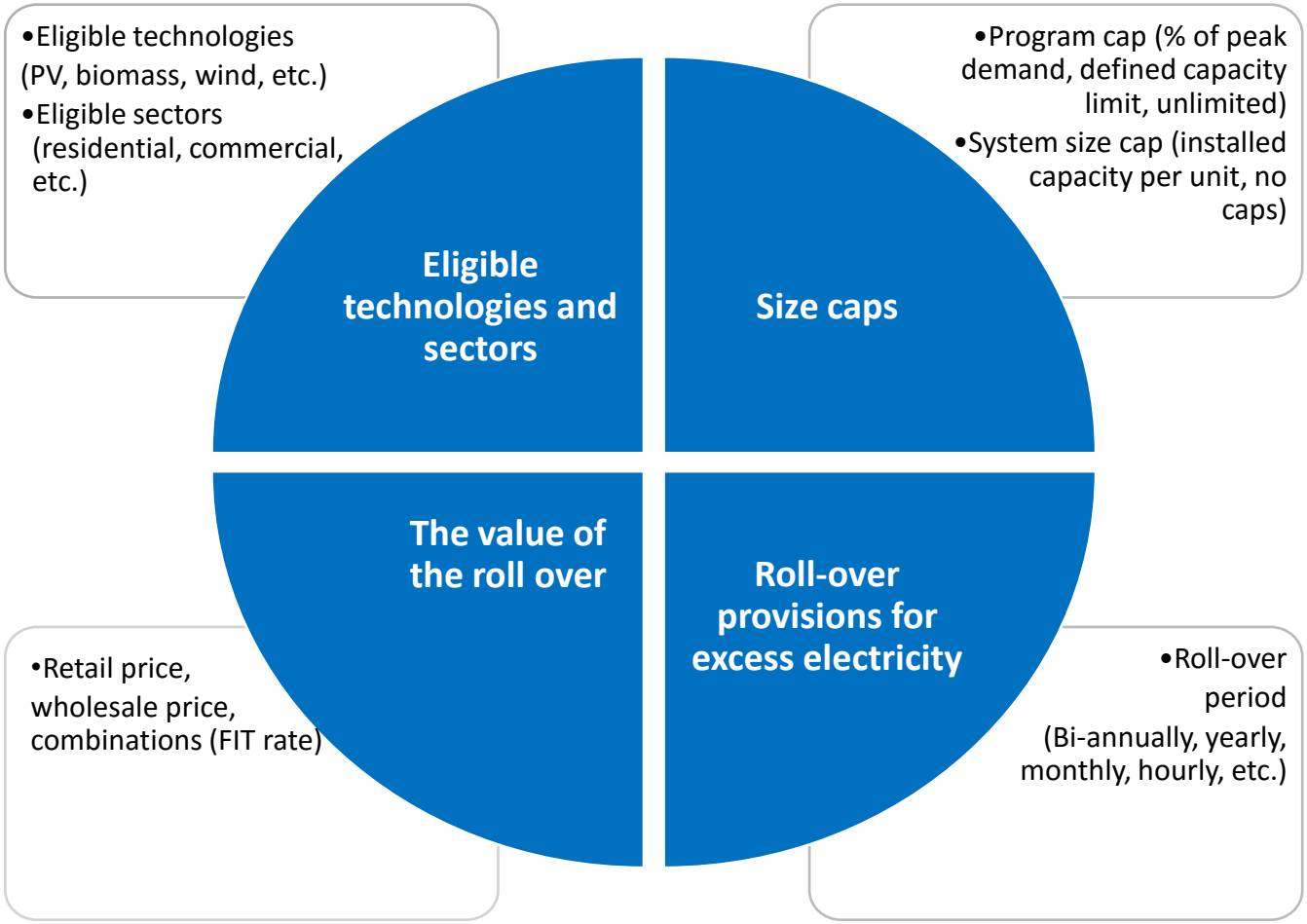
Auctions or FiTs?

- Is there experience in setting prices administratively?
- Is there sufficient interest in investing in renewable energy?
- Is the market big enough to create competition (size of auction)?
- Which type of actors should invest (small vs. big)?

Auction and FiTs?

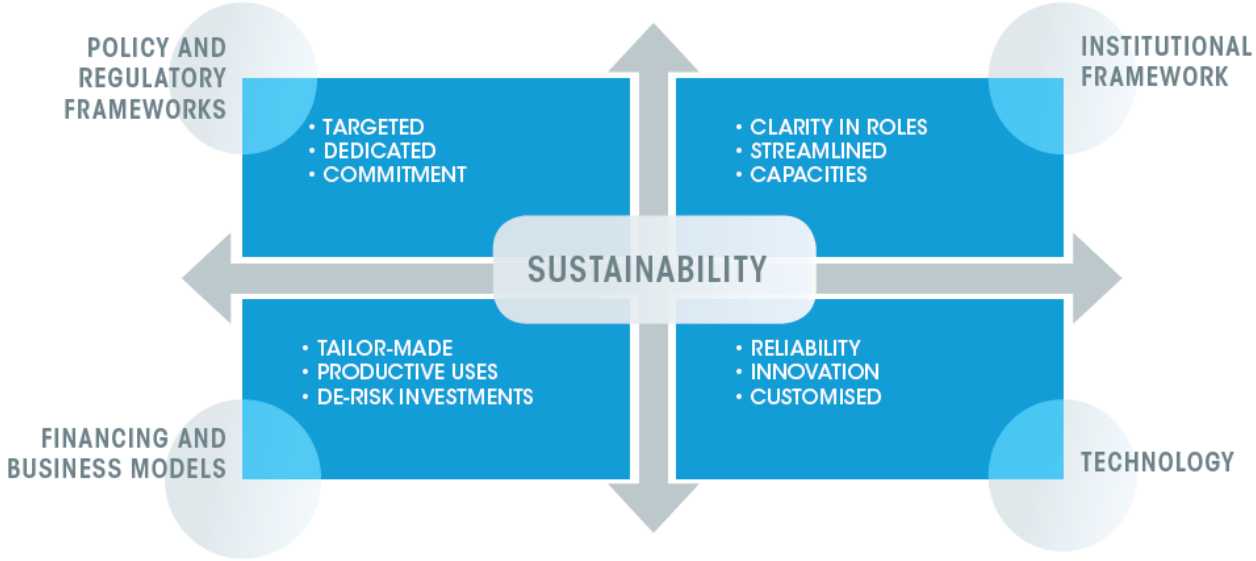
- Use auctions to determine FIT prices (China)?
- Use auctions for emerging technologies and FITs for mature technologies (Denmark, China)?
- Use auctions for large projects and FITs for small projects (France, Taiwan)?

Net metering– Design elements



Source: Freeing the Grid 2014

Enabling environment for off-grid renewables deployment



1. **Moving away from a project-by-project approach** towards a market-based approach where scale up in off-grid RE can occur sufficiently enough to meet 2030 targets.

2. **Ensuring sustainability in energy access efforts** wherein all elements of the energy service delivery model contribute to reliability and cost-effectiveness.

3. **Leveraging local enterprises and capacities** to expand electricity access in rural areas, rapidly and sustainably, and to maximise value creation.

ASEAN – Overview of policies

OVERVIEW OF ASEAN RE POLICY

Presented by:
Badariah Yosiyana
ASEAN Centre for Energy

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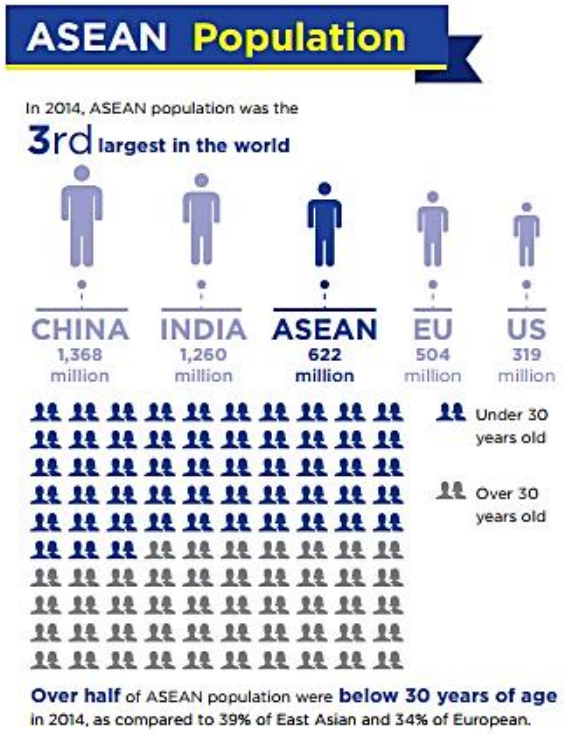
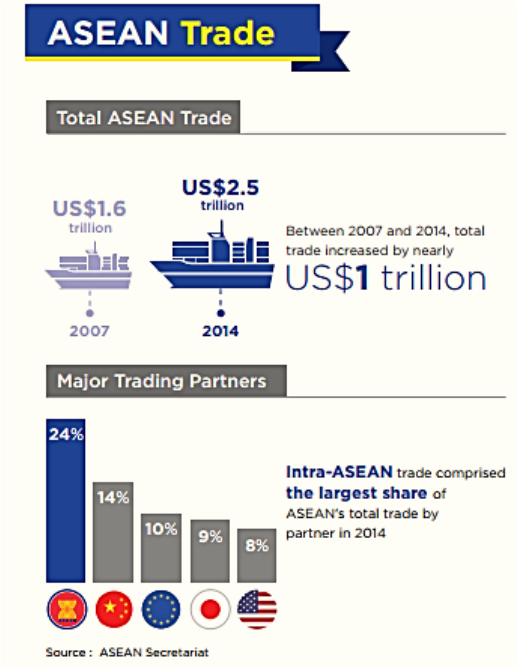
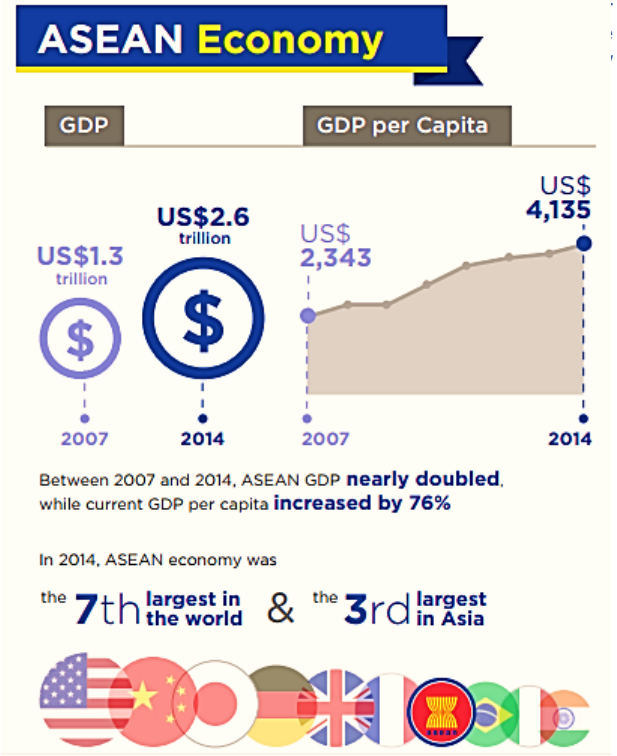
ASEAN KEY FIGURES



Electricity Cons.: **1,178 kwh/cap**
Electrification Rate: 78.7%

Below global averages





The ASEAN Economic Community:

- Effectively implemented on 31 December 2015
- Calls for a well-connected ASEAN to drive an integrated, competitive and resilient regions

REGIONAL COMMITMENTS

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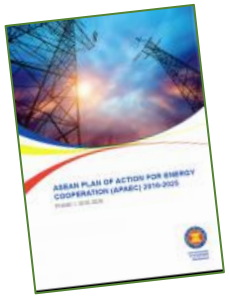
ASEAN Plan of Actions for Energy Cooperation (APAEC) 2016 - 2025



"Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All"

23% Share of Renewable Energy in the ASEAN **Energy Mix (TPES)** by 2025

* Include large scale hydro

Seven Programme Areas

- ASEAN Power Grid
- Trans ASEAN Gas Pipeline
- Coal & Clean Coal Technology
- Energy Efficiency & Conservation
- Renewable Energy
- Regional Energy Policy & Planning
- Civilian Nuclear Energy

CURRENT STATUS ON RE POLICIES

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Country	RE Target	Selling tariff	Incentives	Permits
Brunei	**10%** RE share in Power Generation by 2035*	No	No	No
Cambodia	More than **2 GW** of hydropower by 2020	No	Yes	Yes
Indonesia	**23%** NRE share in energy mix in 2025	Yes	Yes	Yes
Lao PDR	**30%** RE share of total energy consumptions by 2025*	No	Yes	Yes
Malaysia	**4 GW** RE installed capacity by 2030*	Yes	Yes	Yes
Myanmar	**15% - 20%** RE share in installed capacity by 2030*	No	No	No
Philippines	**15 GW** installed capacity in 2030	Yes	Yes	Yes
Singapore	**350 MW** installed capacity of **solar** by 2020	Yes	Yes	Yes
Thailand	**30%** AE share in total energy consumption by 2036*	Yes	Yes	Yes
Vietnam	**27 GW** RE installation in 2030*	Yes	Yes	Yes

*exclude large hydro

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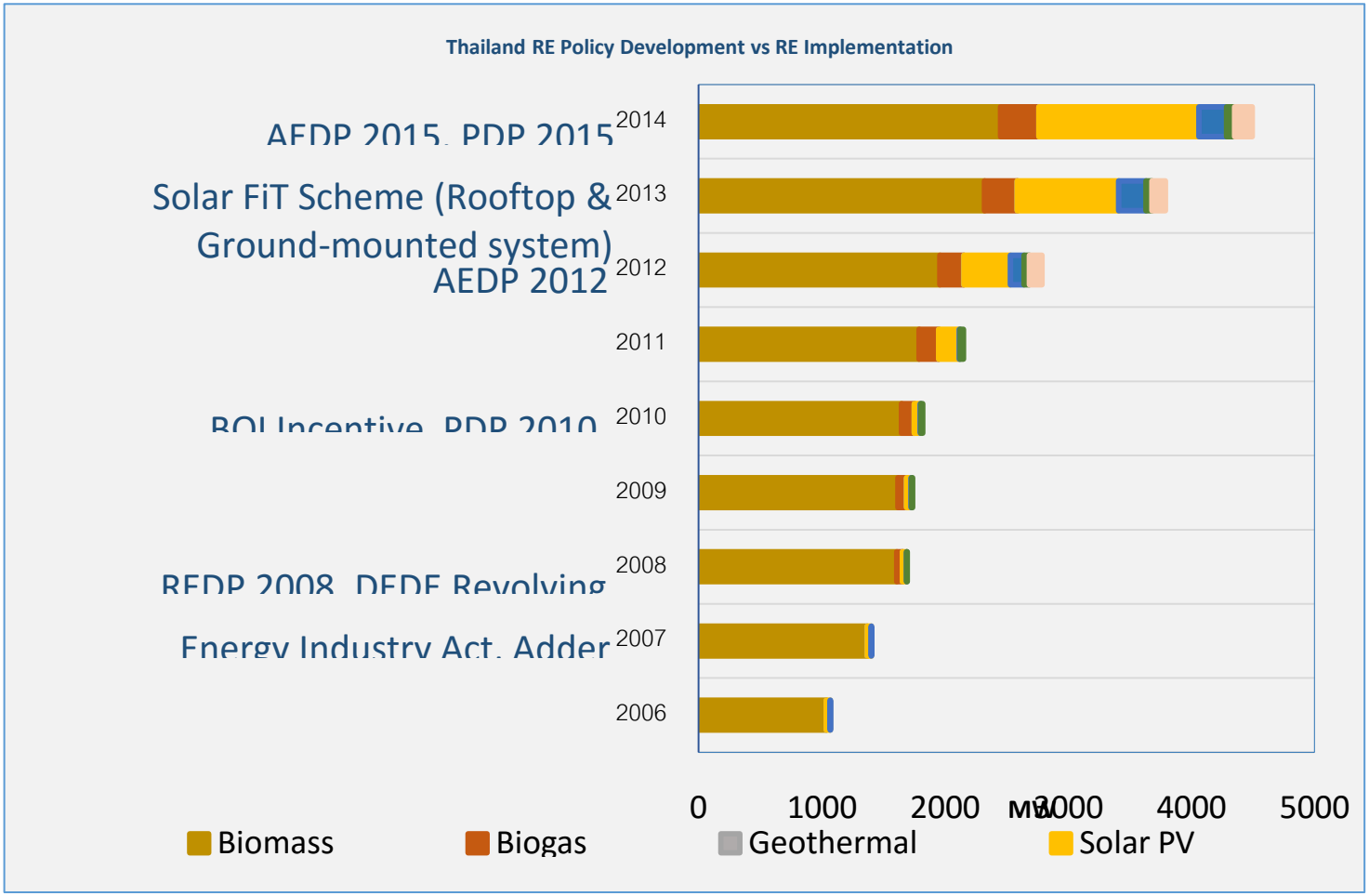

TPES – NOW AND THE PROJECTION

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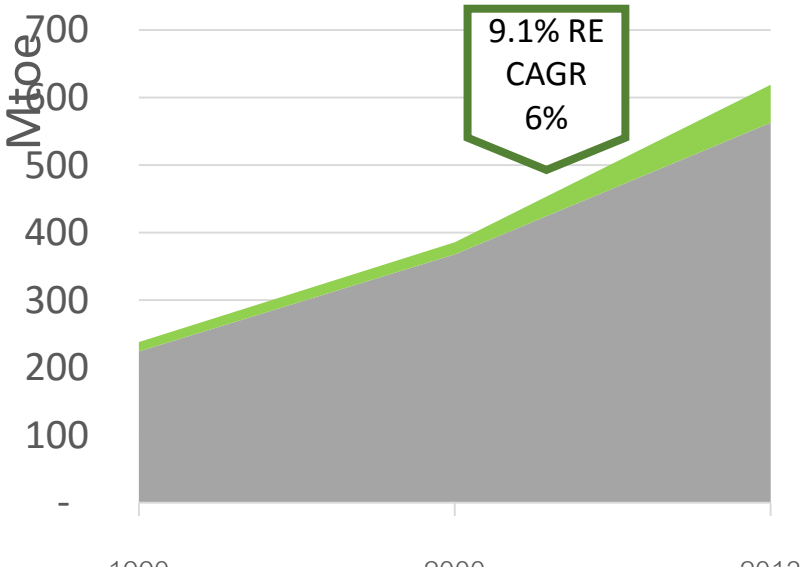
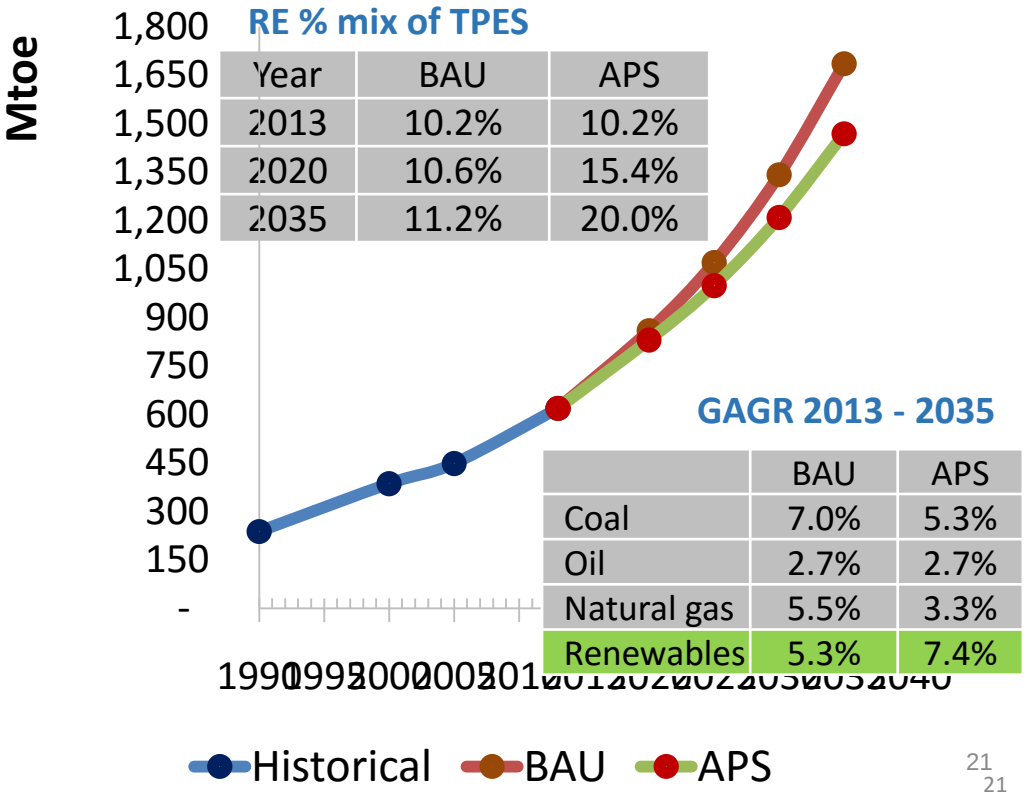


Renewable Energy : **56 Mtoe**

32 % Hydropower 19% Geothermal 49% Others RE



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MINISTRY OF SCIENCE AND TECHNOLOGY

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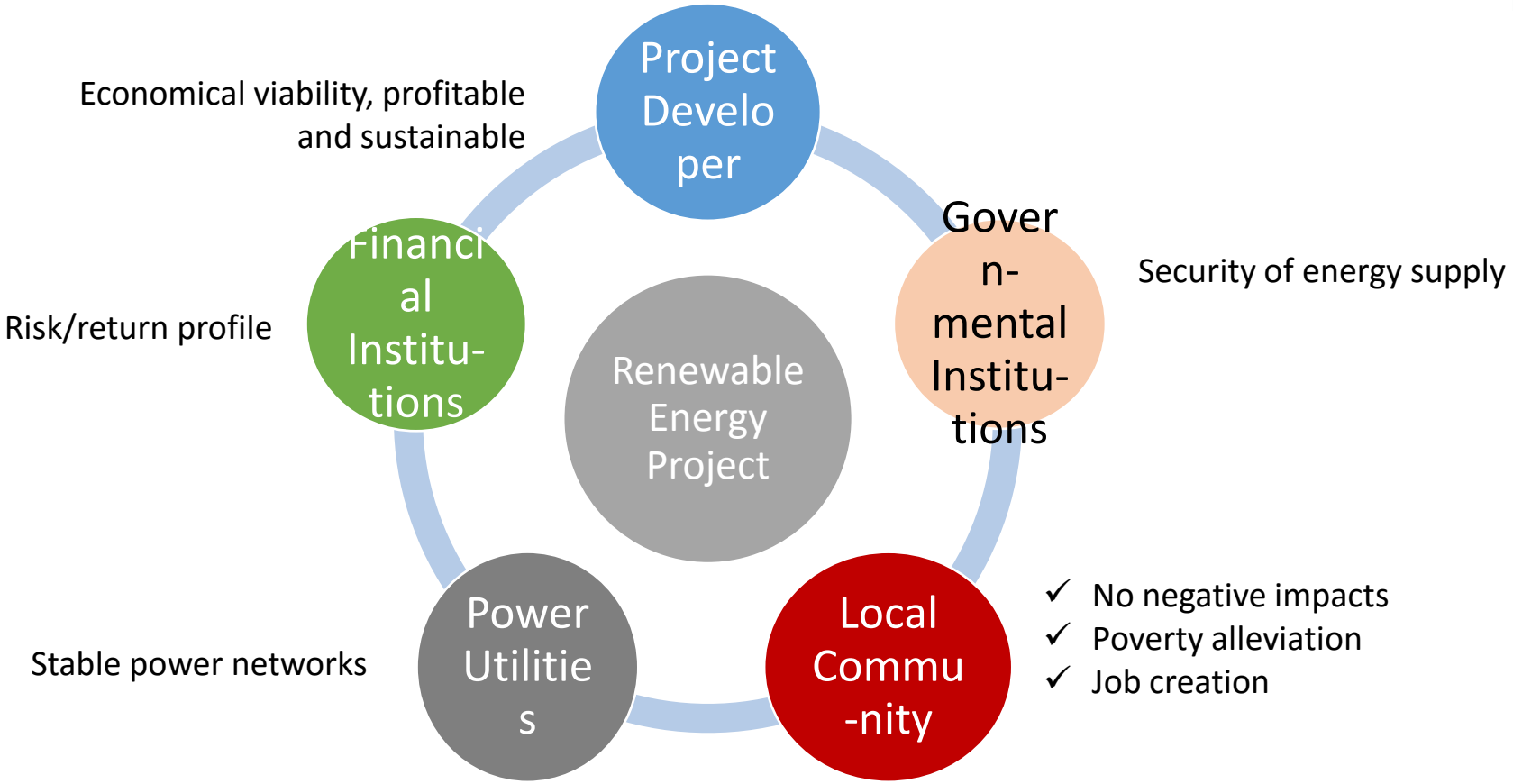
LANDSCAPE FOR RE PROJECTS



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CHALLENGES IN RE DEPLOYMENT IN ASEAN

a. Technical Issues

- Unavailability of data for preliminary assessment
- Information exists, but lack of practical knowledge in project development
- Lack of qualified & experienced technical consultants for project development
- Distance & compatibility of grids to be connected to RE source
- Scale or size of the project does matter in terms of development costs and land acquisition

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CHALLENGES IN RE DEPLOYMENT IN ASEAN

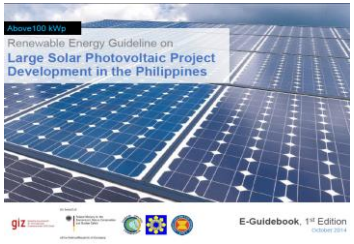
b. Non Technical Issues

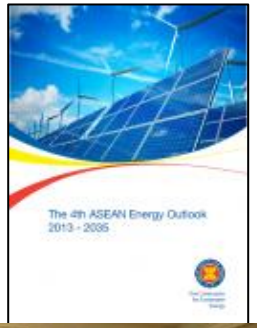
- Unreliable and unpredictable RE policy and regulatory measures
- Complex and time-consuming procedures
- Difficulty to get external financing
- Feasibility studies have not met banks' criteria
- Reliable supply of fuels (e.g. biomass or biogas power plant)
- Unappealing track record on RE projects
- Necessary documents cannot be provided in the early phase
- Power utility is a big factor in deciding RE projects due to its grid connections
- Environmental issues

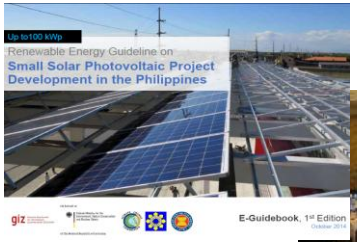
RENEWABLE ENERGY PROGRAMME

One Community for Sustainable Energy

- Publication
- Joint Study
- Pilot Project
- Information Dissemination
- Focus Group Discussion
- Capacity Building
- Training







ASEAN – policy and financing frameworks

Renewable energy policy

KEY MESSAGE

- There is a need, **1st** thing, to have legislative framework and Clear Renewable Targeting, and Energy Saving Goal;

- If RPS to be applied, it will require designated consumers to have some proportion of RE consumption (i.e.,20-30%) of the electricity bill.

Renewable energy policy

Some renewable technologies are not as competitive as thermal power generation technologies using fossil fuel. Therefore, Supportive RE policies are needed-

- Energy policies: Feed-in-Tariff (FIT), Renewable Portfolio Standard (RPS), net metering, carbon tax, or carbon cap and trade.
- Financial policies: Public financing, carbon financing, and banking regulations with sustainability requirements.
- The key to incentivise private investment in renewable energy is to lower the risks related to renewable energy projects and improve the profitability prospects.

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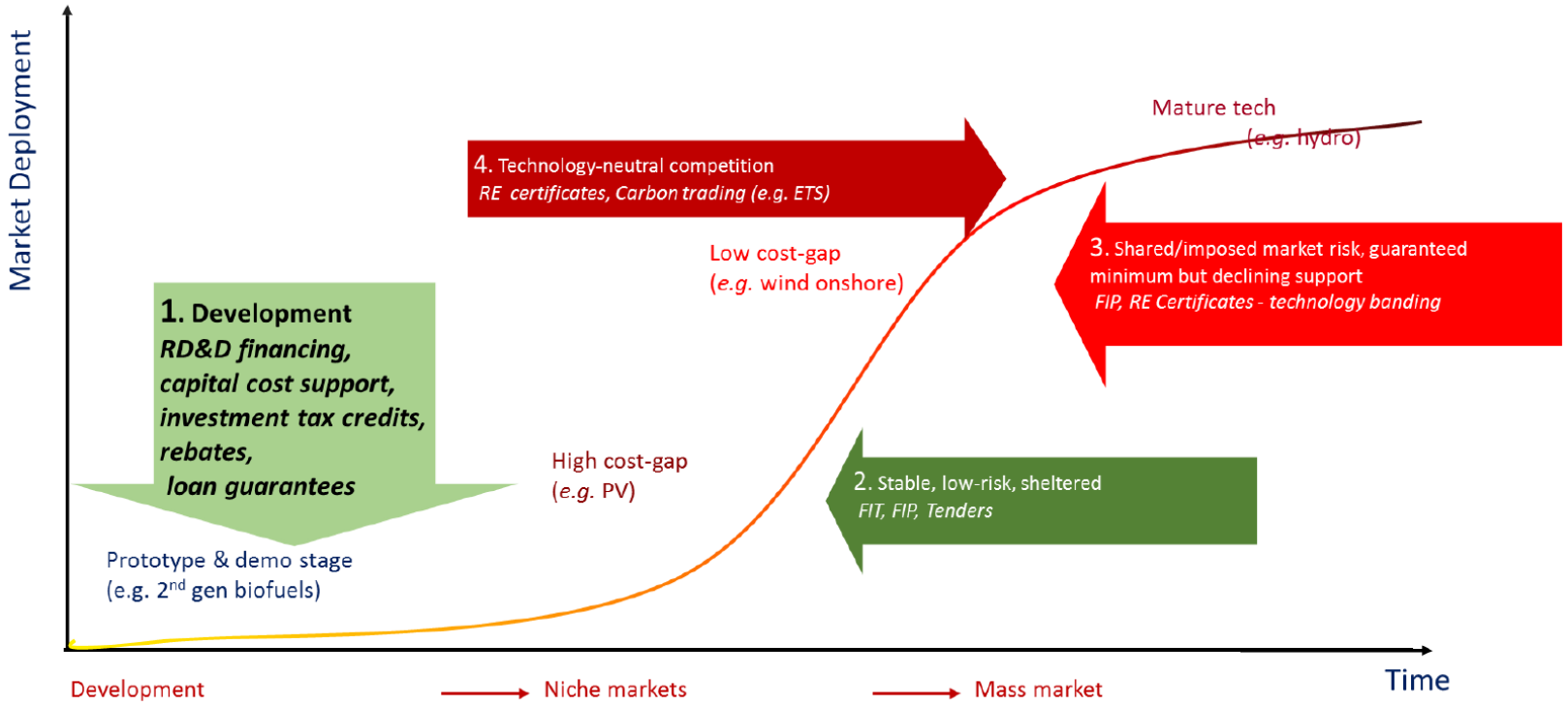
Renewable energy policy innovations



Renewable energy financing and subsidies

The purpose of the subsidies to biomass projects is to increase the number of projects, guaranteeing the safety and quality of energy and reducing the energy dependency and emissions;

- In general, the government subsidied upfront cost about 20-30 % for the installation of boiler of biomass power generation.
- Long term loan (10-15 years)
- Low interest rate (0.5-1% annually)
- Guarantees- which enterprise can use as collaterals
- Premium price of electricity produced using biomass (Feed in Tariff)

EXAMPLE-SUBSIDIES FOR BIOMASS POWER GENERATION

Installations for power production that use only bioenergy sources and with and installed power lower than 1 MW	Subsidy Amount	Maximum
Combustion Installations (Solid, liquid and gas fuels)	600 €/kW	100.000 €
Installations of gasification/pyrolysis	1.200 €/kW	100.000 €
Installations for the production and supply of heat, using only bioenergy sources	Subsidy Amount	Maximum
Biogas installations	60 €/kW	100.000 €
Installations for cattle, forest or wood activities that do not use biogas	90 €/kW	100.000 €
Installations that use biomass as fuel and produce heated water or air with power higher than 5 kW and lower than 15 kW	1.000 €	1.000 €
Installations that use biomass as fuel and produce heated water or air with power higher than 15 kW.	2.000 €	2.000 €
Studies about the logistic of supply for biomass and the energy uses of it and district heating installations that use only bioenergy sources.	3.000 €/study	3.000 €

Source: Intelligent Energy Europe, 2016

Conclusions

- Market correction-Phase out fossil fuel subsidy;
- Removing barriers in RE development and Re deployment
- Design Re policy incentive and supports based on the nature of fuel cost, operation cost, and investmement cost;
- Institutional and finacial framework to support renewable up-takings;
- Allocation of fund for R&D in renewable energy, and update Res market development.
- Capacity building and training

Cambodia

Renewable energy policy - Cambodia

- To provide an adequate supply of low cost energy for homes throughout Cambodia
- To ensure a reliable, secure electricity supply at prices which encourage investment in Cambodia and economic development
- To encourage exploration of environmentally and socially acceptable development of energy resources needed to supply to all sectors of the Cambodian economy
- To encourage efficient use of energy and to minimize environmental effects resulting from energy supply and use

Indonesia

Lao PDR

Drivers for renewable energy deployment

1. Good policy
2. Appropriated governance
3. Market available
4. Good business condition

Good policy

- Increase a share of renewable energy to 30% in the total energy consumption by 2025
- Appropriated Policy to support the RE and the target of GoL.
  - There are National Renewable Energy Strategy
  - Policy on Sustainable Hydropower Development in Lao PDR (PSHD)
  - Investment Promotion Law
  - Electricity Law
  - Tax Law and
  - Environmental Impact Assessment (EIA)

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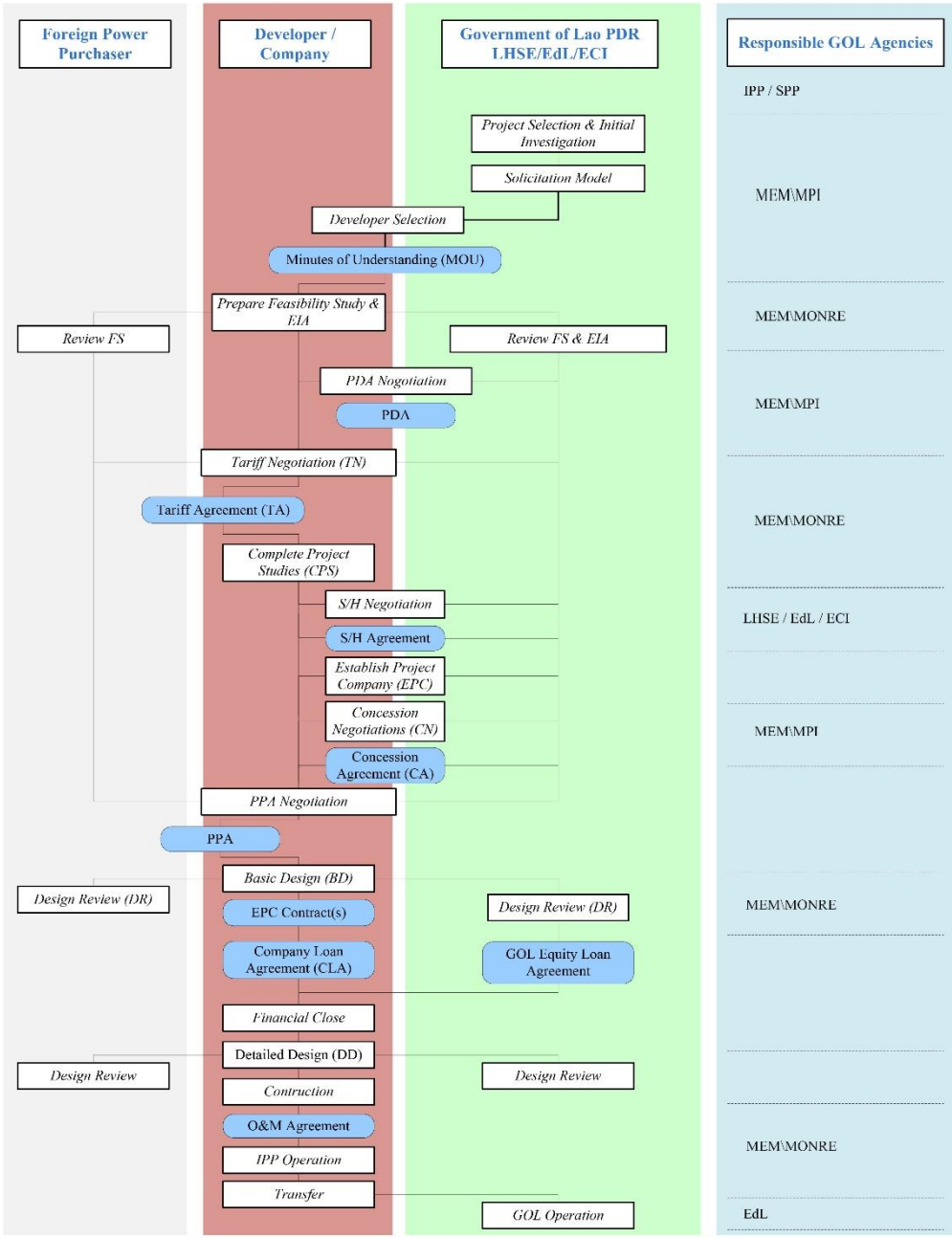
Appropriated Governance

Figure I

Independent Power Producer (IPP) Project Implementation Process



Remarks : **MPI** : Ministry of Planning and Investment, **MEM** : Ministry of Energy and Mines, **DOF** : Department of Electricity, **DEPD** : Department of Energy Promotion and Development, **EdL** : Electricite du Laos, **DDFI** : Department of Direct foreign Investment, **LHSE** : Lao Holding State Enterprise-GOL's Representive for export IPP, **ECI** : Electric Construction and Installation-GOL'sRepresentative for SPP, **SPP** : Small Power Producer, **EIA** : Environmental Impact Assessment, **PDA** : Project Development Agreement, **S/H** : Shareholder, **PPA** : Power Purchase Agreement, **EPC** : Engineering Procurement & Construction, **GOL** : Government of Lao PDR, **O&M** : Operation & Maintenance, CDEP : Coordinating Committee for the Development of Electric Power.

Market available and Good business condition

- Market available: Both domestic and neighboring countries (Thailand, Vietnam, Cambodia)
- Good business condition
  - ✓ Geographic
  - ✓ High potential of hydropower development> 26,000 MW
  - ✓ Appropriate investment
  - ✓ High investment rate of return and low risk

Malaysia

Myanmar

Renewable energy policy - Myanmar

Renewable Energy Policy	Myanmar

Renewable Energy Policy is under drafting stage in cooperation with ADB.

Renewable energy challenges- Myanmar

- **Hydro**
- It is necessary to develop the double installed capacity with development risks and initial investment increase against the demand due to the reduction of power generation in dry season Impacts on the social and natural environment such as resettlements are significant. Lead time for the development (survey, design, construction and commissioning) is long.
- **Wind**
- Mostly with slow wind speeds less than 4m/s and limited grid and system capacity is a critical factor hampering large-scale wind generation.
- **Solar**
- Off grid: Solar-powered battery-charging stations, solar lighting, solar home systems, and village mini-grids with solar components have been implementing but more research is needed to determine the levelized cost of electricity-LCOE for small scale off-grid solar PV generation.
- On grid: a technology is required for system stablility to connect with national grid system by large scale solar power plant.

Renewable energy policy - Myanmar

Regional

ASEAN member states have agreed to adopt the target of 23 per cent renewable energy use in the fuel mix in the region by 2025

20 per cent reduction of carbon emission in the region in 10 years' time at 33rd AASEAN Ministers on Energy Meeting on 7th October 2015 in KUALA LUMPUR: Malaysia.

Country-Specific: MYANMAR

The Government strategy for new electric power generation plants to be constructed in 2030 will be based on energy mix of about 9% (2000 MW) of renewable sources

Renewable energy policy - Myanmar

- The government will encourage deploying green technologies in a range of sectors including energy and enact policies for clean energy development for low carbon economy.
- Myanmar has made international commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and the related Kyoto Protocol, which Myanmar ratified in 2003. The Government is fully aware that without adequate environmental and social safeguards, climate change mitigation and adaption policies, and energy efficiency regulations, Myanmar's energy and electric power sectors will continue to be vulnerable to environmental challenges.
- The Energy Sector Policy aims to integrate the social and environmental considerations in the national energy planning and in the complete cycle of energy development.

Philippines

Renewable energy challenges - Philippines

Barriers and Challenges

- High upfront and technology costs
- Non-competitiveness
- Non-viable markets
- Inaccessible financial packages
- Social Acceptability

Renewable energy policy - Philippines

Enactment of two landmark laws on renewable energy

- Republic Act No. 9367 or the Biofuels Act of 2006
- Republic Act No. 9513 or the Renewable Energy Act of 2008

Renewable energy policy - Philippines

Fiscal Incentives

Mandatory Utilization of RE Resources

- Biofuels Mandate
- Renewable Portfolio Standards (RPS) for on-grid and off-grid areas
- Feed-In-Tariff (FIT)

Provision of Interconnection/Ancillary Services

Other Market Options

- Net Metering Rules and Interconnection Standards
- Green Energy Option Program

Policies to support renewable energy deployment

Department Circular DC2015-03-0001 Framework for the Implementation of Must Dispatch and Priority Dispatch of Renewable Energy Resources in the Wholesale Electricity Spot Market

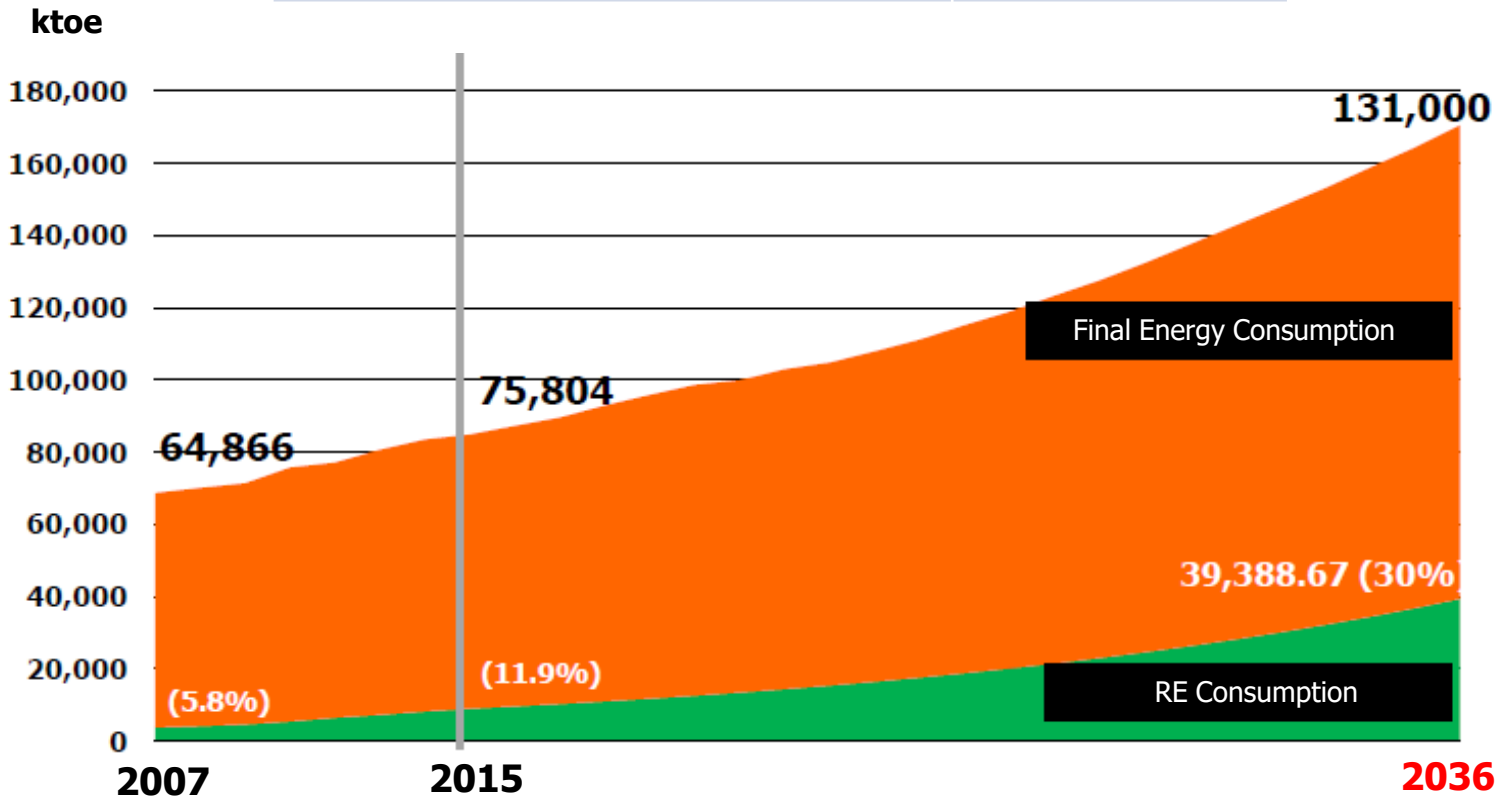
Department Circular DC2015-07-0014
Prescribing the Policy for Maintaining the Share of Renewable Energy (RE) Resources in the Country's Installed Capacity Mix through the Wholistic Implementation of the Pertinent Provisions of RA 9513 on FIT System, Priority and Must Dispatch, among others

Thailand

Alternative Energy Development Plan (AEDP) 2015-2036

Goal: *Target 30%* renewables in Total Energy Consumption by 2036

Target	ktoe
RE Consumption (ktoe)	39,388.67
Final Energy Consumption (ktoe)	131,000
RE share (%)	30%



Alternative Energy Development Plan (AEDP) 2015-2036

Foundation: Commitment to the development of a low-carbon society

Facilitator: *Private-led investment*

Strategy: Alternative Energy Development Plan 2015-2036

Facilitator: *Government funded RD&D*

Goal: ***Target 30%*** renewables in Total Energy Consumption by 2036

Bio-Energy

Biomass	Biogas	MSW + Industrial Waste
5,570 MW	1,280 MW	550 MW
22,100 ktoe	1,283 ktoe	495 ktoe

6,720 MW Power | 23,878 Ktoe Heat

Bio-Fuel

Ethanol	Biodiesel	Pyrolysis Oil
11.3 ML/Day	14 ML/Day	0.53 ML/Day

CBG	Alt. Fuels*
4,800 t/Day	10 ktoe

Solar

6,000 MW

1,200 Ktoe

Wind

3,002 MW

9,002 MW Power | 1,200 Ktoe Heat

Hydro

Large Hydro 2,906.40 MW	Small Hydro 376 MW

3,282.40 MW

New-Energy

Geothermal, Used Tire Oil, etc.

10 ktoe

* Alternative fuels = Bio-oil, Hydrogen

Main Activities

Electricity

- Area-based RE power generation target must be related to RE potential (RE Grid Capacity)
- Develop and support for power generation from unutilized fuel (e.g. agricultural waste, industrial waste, fast growing crop)
- Support competitive bidding for power purchasing system

Heat

- Promote and support RDF transformation for municipal waste management
- Promote and support biomass-derived fuel (e.g. biomass pellet, bio-coal)
- Support biogas generation from waste water or solid waste
- Promote heat utilization in building by building code establishing

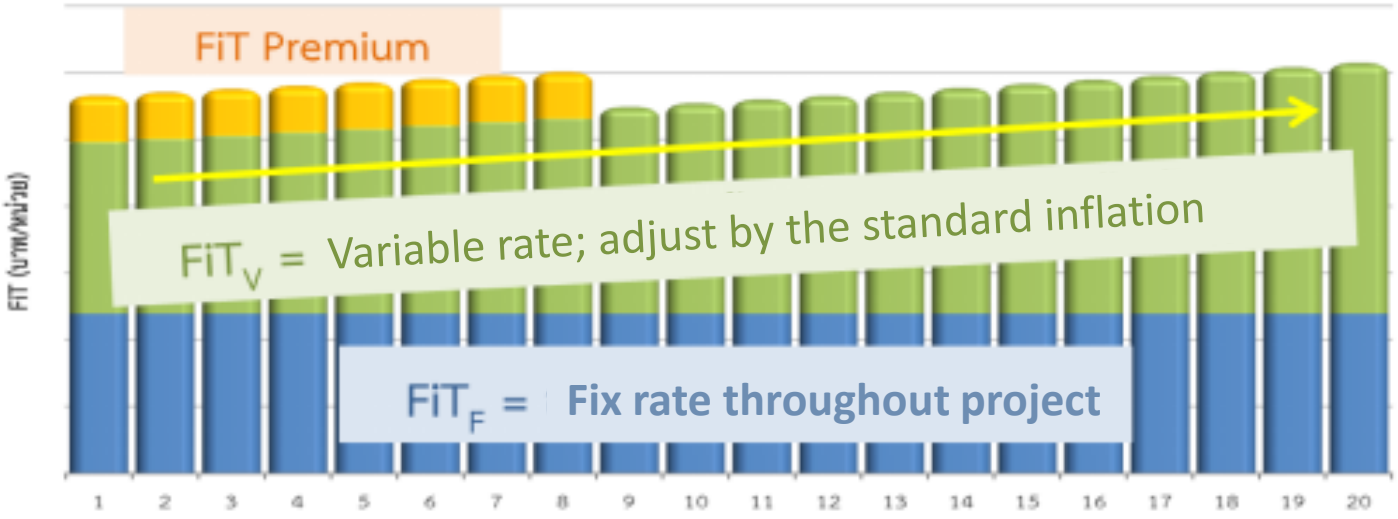
Biofuel

- Promote utilization of B10, B20 in both transportation and industrial sector
- Promote gasohol utilization
- Promote CBG utilization for vehicle and industry
- Promote biofuel production efficiency improvement

Feed-in Tariff Scheme

$$FiT_i = FiT_F + FiT_{V,i-1} \times (1+\text{Core inflation}_{i-1}) + \text{FiT Premium}$$

i=year of power purchasing



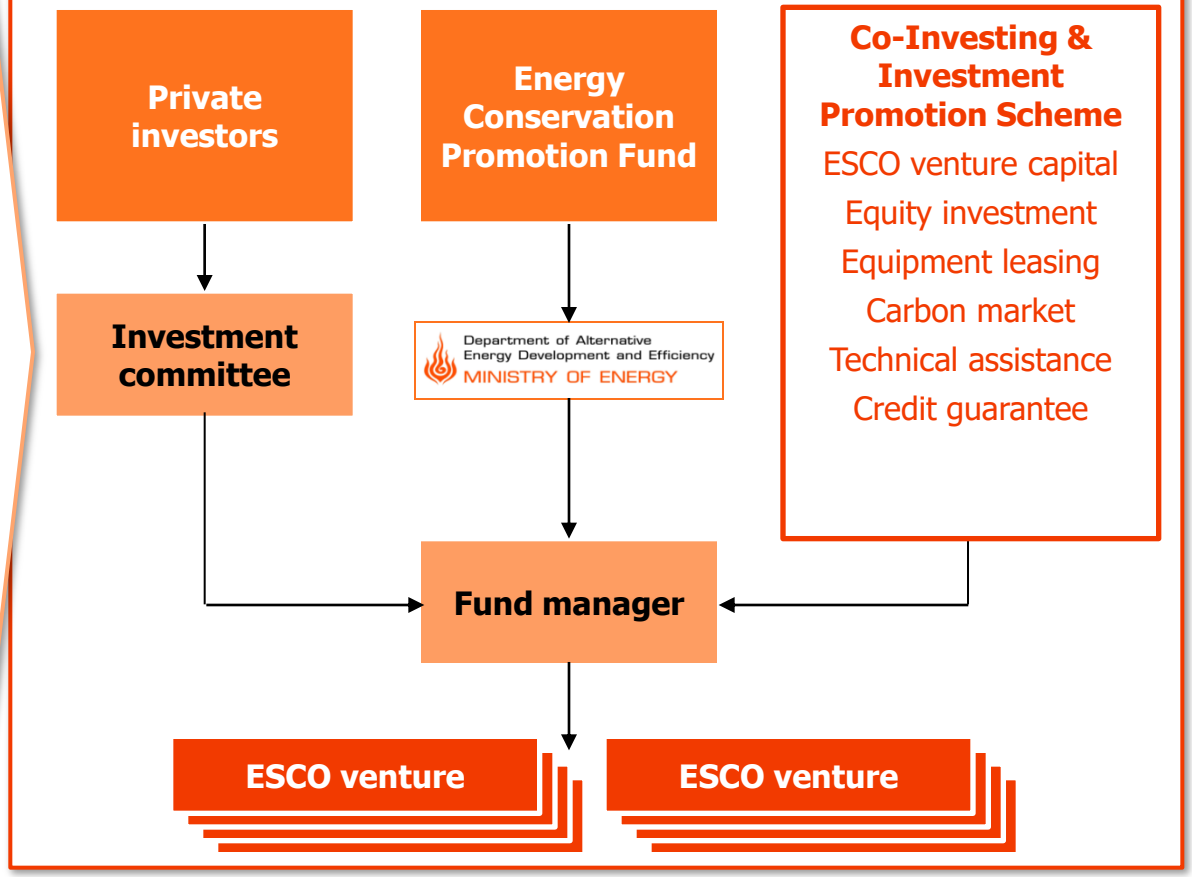
Feed-in Tariff Scheme

Capacity (MW)	FiT (THB/kWh)			Period of Subsidy (Year)	FiT Premium (THB/kWh)	
	FiT_F	$FiT_{V,2017}$	$FiT^{(1)}$		Biofuel Project (8 years)	Project in Southern Territory Area (Throughout Project Period)
1) MSW (Hybrid Management)						
Existing Capacity ≤ 1 MW	3.13	3.21	6.34	20	0.70	0.50
Existing Capacity > 1-3 MW	2.61	3.21	5.82	20	0.70	0.50
Existing Capacity > 3 MW	2.39	2.69	5.08	20	0.70	0.50
2) MSW (Sanitary Landfill)	5.60	-	5.60	10	-	0.50
3) Biomass						
Existing Capacity ≤ 1 MW	3.13	2.21	5.34	20	0.50	0.50
Existing Capacity > 1-3 MW	2.61	2.21	4.82	20	0.40	0.50
Existing Capacity > 3 MW	2.39	1.85	4.24	20	0.30	0.50
4) Biogas (Waste Water/Sewage)	3.76	-	3.76	20	0.50	0.50
5) Biogas (Energy Crop)	2.79	2.55	5.34	20	0.50	0.50
6) Hydropower						
Existing Capacity ≤ 200 kW	4.90	-	4.90	20	-	0.50
7) Wind	6.06	-	6.06	20	-	0.50

ESCO Fund

- DEDE has also developed an ESCO fund to de-risk and encourage investment in renewable focused ventures
- Fund pools capital from the Thai government's ENCON fund with capital from private investors
- In addition to capital funding, ESCO fund provides access to low cost equipment leasing
- Thus far, the ESCO fund has invested a total of 6.1 BN THB (510 MM THB from govt., remainder from private sources) in 54 separate projects accounting for a total energy savings of 1.1 BN THB

ESCO fund structure



Vietnam

Renewable energy targets- Vietnam

RE Strategy Targets	Unit	2020	2030	2050
Electricity Generation from RE	Bil. kWh	101	186	452
Electricity Generation from RE	%	38	32	43

Power Generation (Bil. kWh)	2020	2030	2050
Hydro Power	90	96	
Wind Power	2,5	16	53
Solar Power	1,4	35,4	210
Biomass	7,8	37	85

Note: Source: Viet Nam's Renewable Energy Development Strategy up to 2030, with an outlook to 2050); Renewable energy included hydro power)

Renewable energy policy - Vietnam

RE type	Status		Level	Note
	Existing	Proposing		
Small hydro	Avoided cost		By year, by season (about 5 UScents/kWh)	
Wind power	FIT	revising	7.8 UScents/kWh	Under revising
Biomass	FIT		- CHP: 5.8 UScent/kWh - Generation Cost from imported coal power plant	
MSW	FIT		- Land fill gas:7.28 UScent/kWh - Incineration: 10.05 UScent/kWh	
Solar PV	Drafting	FIT	-Solar farm: 11.2 US cents/kWh -Rooftop: 14 US cents/kWh	Planed to submit PM by 6/2016
Biogas		FIT	Under studying	
Geothermal		FIT	Under studying	

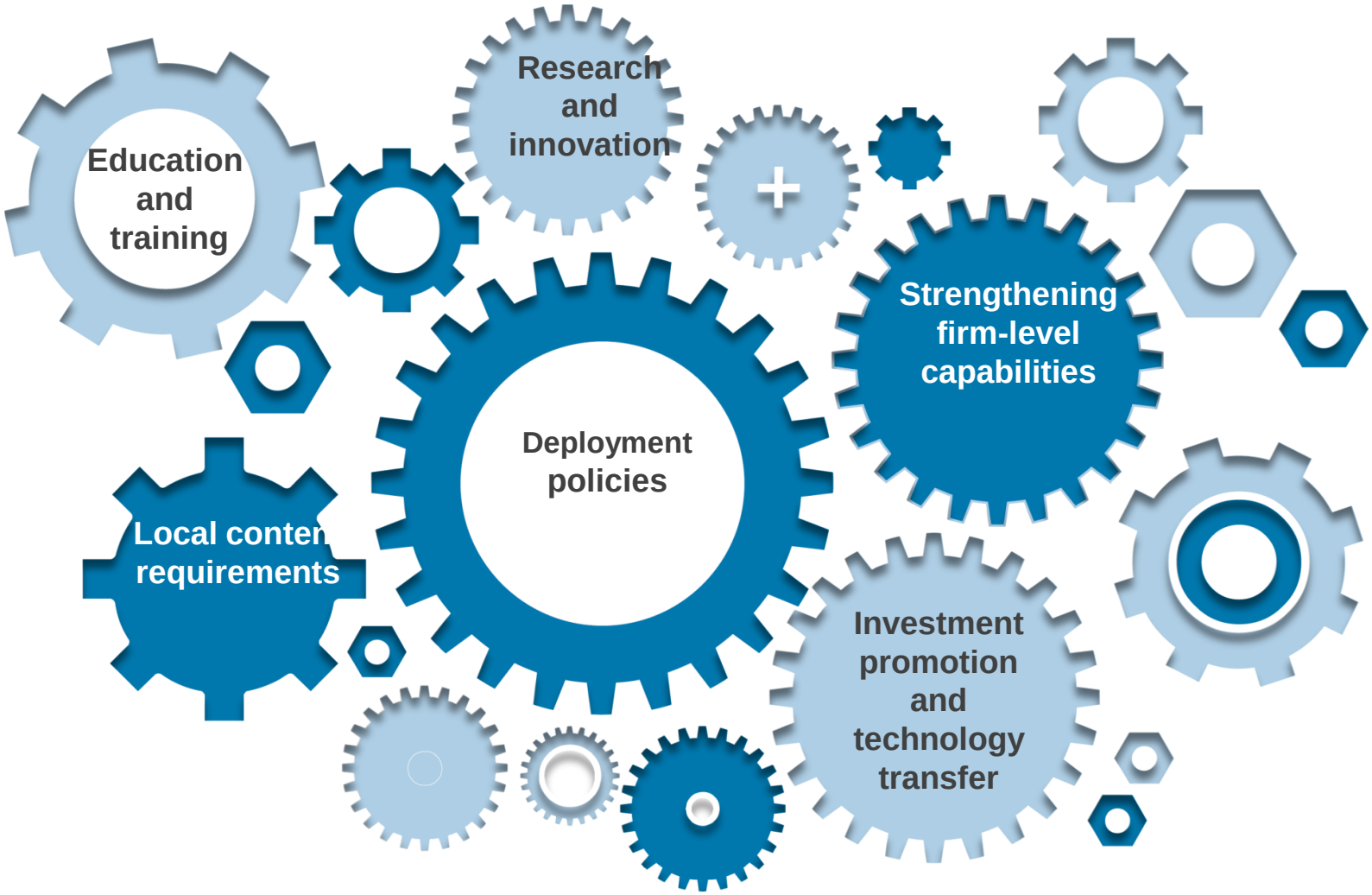
Renewable energy policy - Vietnam

- Corporate tax exemption for the first four years and reduce to 50% in the next 9 years.
- Import tax exemption.
- Obligation to purchase electricity: all electricity generated from RE Project will be bought by Electricity of Viet Nam (EVN).
- Template PPA for 20 years.

APCTT Asian and Pacific Centre for Transfer of Technology

IRENA International Renewable Energy Agency

An Integrated Policy Framework



Key policy recommendations

- Tailored policy mix adapted to country conditions and market segments (large-scale, small-scale and off-grid)
- Long-term strategy with clear targets
- Stable, predictable and adaptable policy framework
- Forward-looking skills, education and training policies
- Higher degree of institutional development and coordination

APCTT
Asian and Pacific Centre for Transfer of Technology

IRENA
International Renewable Energy Agency

Thank you

Policy and regulatory frameworks for off-grid RE

- **Integrating off-grid RE into the national rural electrification strategy** supported by dedicated policies relevant to the sector

- **Stable policy frameworks**
  - ✓ Several rural electrification programmes have succeeded after years of learning and course correction
  - ✓ Policies need to as dynamic as the market they set out to support
- **Effective sector regulation**
  - ✓ Encouraging innovation in technology design, financing and business models that reduce costs and improve efficiency
  - ✓ Flexible tariff-setting for mini-grid projects to allow commercial viability
- **Cooperation and coordination**
  - ✓ Between national and international (public, financing, research, etc.) institutions involved in rural electrification
  - ✓ Between different sectors (health, agriculture, etc.)