

FEED-IN TARIFF FOR INDONESIA'S GEOTHERMAL DEVELOPMENT

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PRESENTATION OVERVIEW

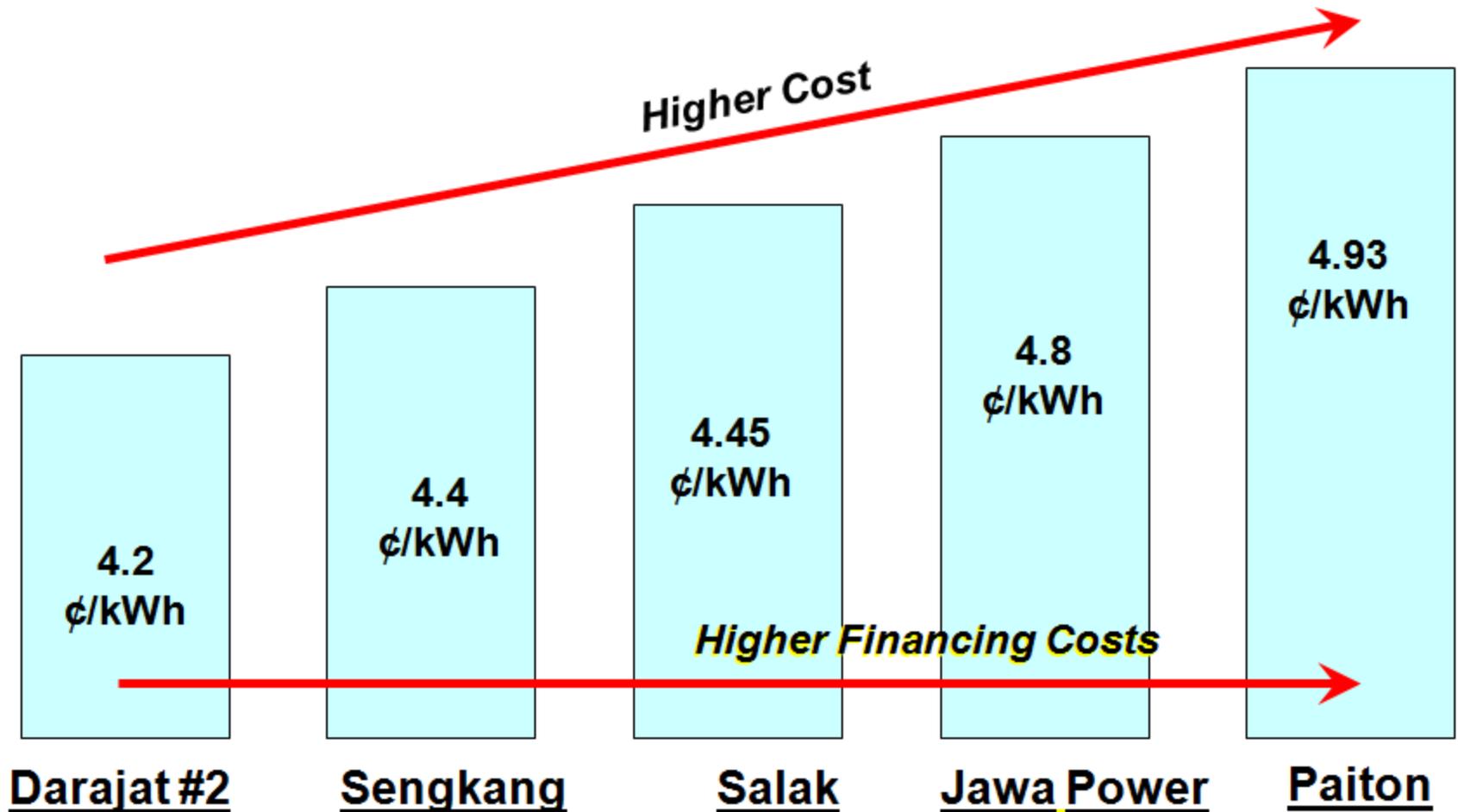
- Overview of Indonesia's Geothermal Tariff.
- Feed Tariff Policy.
- Feed Tariff Design.
- Indonesia's new Feed-in Tariff.



HISTORY OF GEOTHERMAL TARIFF

- Early 1990's: use two pricing schemes:
 - One component:
 - Based on the kWh dispatched.
 - Escalation indices and “take-or-pay” capacity provision of 80% - 90%.
 - Two or more components:
 - Capacity charge (USD/kVA/month): capital recovery charge comprising return for equity capital, debt repayment, tax and depreciation, contract capacity and availability factor (will decline after the project is paid out).
 - Energy charge (USD/kWh: pass-through cost components as determined by the quantity and type of fuel, specific heat rate and fuel price, and fixed and variable operating and maintenance charge (escalated).
- After monetary crisis (late 1990's): use single pricing schemes:
 - With limited escalation rather than cascading.
 - Capped the base electricity price up to USD 0.05 per kWh (1999-2003).
 - MEMR Regulation Nr. 2/2011: USD 0.097 per kWh.

WHAT HAPPENED 1999 - 2002



MEMR's REGULATIONS

- MEMR Reg. No. 14/2008 introduced geothermal maximum tariff at different level depending on basic cost of generating electricity in the area where the geothermal projects are located.
- MEMR Reg. No. 5/2009 stipulates that geothermal prices are to be determined on business to business negotiation between PLN and developers.
- MEMR Reg. No. 32/2009 caps geothermal electricity price at USD 9.7 cent/kWh.
- MEMR Reg. No. 2/2011 authorizes PLN to purchase geothermal electricity at tendered price < USD 9.7 cent/kWh. Prices higher than USD 9.7 cent/kWh should be negotiated, supported by owner estimate and approved by MEMR.
- MEMR Reg. No. 22/2012 sets Feed-In Tariff (FIT) of geothermal electricity based on avoided cost principle – differentiated by geographical location and connecting voltage to grid.
- Other Renewable:
 - MEMR Reg. No. 31/2009 sets FIT for Mini-hydro below 10 MW.
 - MEMR Reg. No. 4/2012 sets FIT for Biomass, Biogas & Municipal Solid Waste.

FEED-IN TARIFF POLICY (1)

- Definition & Characteristics:
 - A Renewable Energy Policy that typically offers a guarantee of payments to Project Owners for total kWh of renewable electricity.
 - Access to the electric grid for electricity generated from RE.
 - Long-term contracts designed to provide a reasonable profit for companies that generate electricity from renewable sources.
 - An obligation on electric utilities to buy electricity generated from renewable sources.
 - Also called: Fixed price policies, minimum price policies, standard offer contracts, renewable energy tariffs.
- Advanced form of a production-based incentive:
 - Payments for actual electricity produced and not for capacity is installed.
 - Based on levelized generation cost – to ensure reasonable ROR to investors.
 - Add risk premium on geothermal energy purchase price to maintain project economic viability.

FEED-IN TARIFF POLICY (2)

- Benefits:
 - Differentiated FIT payments by:
 - RE resource type.
 - Technology type.
 - Project size.
 - Quality of resources; and/or
 - Other project specific variables.
 - FIT can provide Investor certainty.
 - FIT can meet renewable electricity (and climate change) goals.

WORLD WIDE APPLICATIONS

- Countries world wide (60 nations) are increasingly turning to FIT as a mechanism to develop geothermal energy:
 - Power companies is obligated to purchase power from renewable energy sources at fixed prices (may be determined as certain ratio [e.g. 90%] of retail tariff or as a definite price for each RE source).
- In Germany, the Electricity Feed-in Law (1991):
 - Power companies under an obligation to buy RE power.
 - Price = 90% of general power tariff to end-user with upper limit of 5% of sales.
 - Geothermal (2011):
 - > 10 MW: 10.3 € cents
 - < 10 MW: 15.7 € cents
- In US: Power companies under an obligation to buy power from the Qualifying Facilities (QFs) based on its Value or at the Avoided Price:
 - QF is left to respective State (a non-power company with equipment capacity less than 80 MW which makes cogeneration or RE power generation).
 - In 1995 Federal Government unified definition of Avoided Price as “the cost at which the power company itself generates power, or the cost at which it buys the power from other power company”.

FIT POLICY DESIGN OPTION

- Price Method:
 - Estimated Cost plus targeted return.
 - Avoided Cost (value).
- Payment Structure:
 - Fixed payment.
 - Premium (above market): with caps and floors.
- Differentiation:
 - Types of resources.
 - Technology.
 - Project size.
 - Project Location.
 - Resource quality.

GERMANY: FIT POLICY SUCCESS

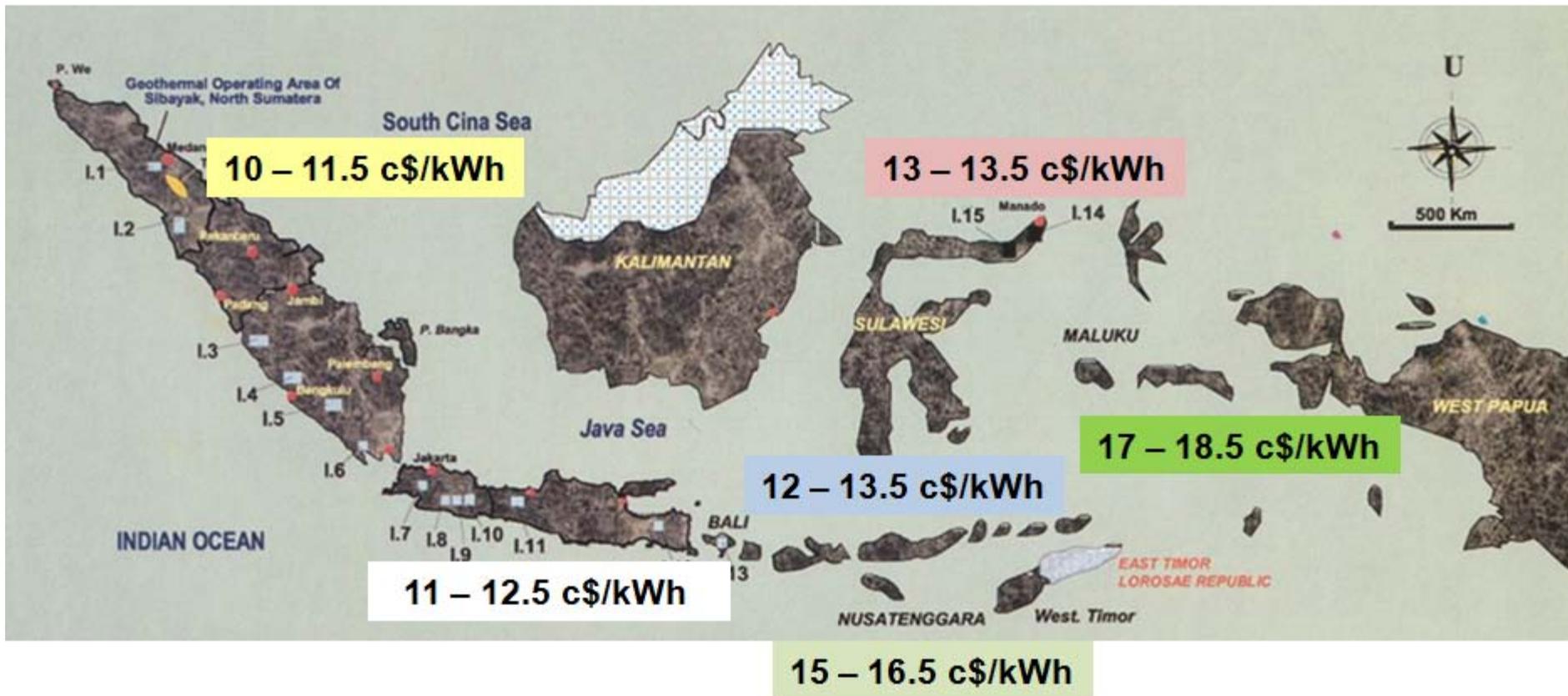
- Methodologically based on Renewable Energy's Project Cost (plus return).
- Have been in place over a long period of time (policy stability and reduce uncertainty).
- Involve long-term contracts.
- Differentiated by technology, type, project's size & resource quality.
- Generally available to all end users and project investors.
- Incentives to drive innovation and cost reduction.

FIT POLICY CHALLENGES

- Need upfront capital, but long-term contract will increase investor's confidence.
- Setting tariff is challenging:
 - Require detailed analysis in determining payment level at the outset so ensuring that revenues will be adequate to cover project costs and right balance across a wide range of technologies and project sizes and fiscal policy.
 - If too low: little RE development.
 - If too high: surplus profits to developers.
- Complexity:
 - High technology may increase cost.
 - Can be designed to limit support for high technologies.

FEED-IN TARIFF

MINISTRY ESDM REGULATION Nr 22/2012
23 August 2012



BENEFITS FOR INDONESIA

- Positives step forward in the development of Indonesian geothermal projects.
- Fixing the price for geothermal projects should assist in the roll-out of future geothermal projects in Indonesia:
 - 51 geothermal projects in the second “10,000 MW Fast Track Power Generation Projects”.
- At a capped price of US 9.7 ¢/kWh, only geothermal projects with capacity above 110 MW or 2 x 55 MW are progressing.
- Hopefully with the new FIT the remainder of geothermal projects will move forward at accelerated pace.

PARTIES ENTITLED FOR NEW FIT

- 1) New IUP holder (to be issued after 23 Augustus 2012).
- 2) Existing developers (before Geothermal Law Nr. 27/2003) who are planning for plant expansion.
- 3) Existing developers (before Geothermal Law Nr. 27/2003) who are nearing contract expiration and to be extended.
- 4) Existing developers (before Geothermal Law Nr. 27/2003) who have the PPA in place but have not produced steam or electricity provided there is a clause in the agreement that allows the price negotiation.
- 5) Existing IUP holders who are in the process of negotiation for Power Purchase Agreement (PPA), subject to the Parties' agreement & that price adjustment is allowed under the PPA.

ISSUES: TRANSPARENCY

- Negotiation Process:
 - Existing IUP holders who are in the **process of negotiation** for Power Purchase Agreement (PPA).
 - Article 4: allowing PLN to buy the power at **higher price**:
 - Agreement by parties.
 - PLN's own estimates.
 - Approved by the Minister.
- Potential developers **will no longer** be required to bid the tariff that they are willing to accept:
 - What criteria to be used in determining the winner of a tender?
 - New bid evaluation criteria must be established:
 - Work program & Expenditures commitment.
 - Signature Bonus.
 - Technical & Financial Capability (supported by bank guarantees/escrow).

ISSUES: PRICE ESCALATION

- MEMR's Regulation Nr.22/2012:
 - Floor Price versus Price Cap ?
 - Opponents to price escalation: computation for FIT has been made based on levelized costs of energy.
 - Supporters to price escalation:
 - Escalation of operational expenses.
 - Capital costs for drilling make-up wells.
- GR Nr. 14/2012, art. 39, Electricity Supply Business Activities:
 - Electricity price is approved by Minister, Governor or Major:
 - Maybe adjusted due to certain changes of cost elements on the basis of mutual agreement which should be stated in the PPA. legal basis for price escalation in a PPA.
 - Price escalation can only be made effective if there is significant changes of certain economic parameter (CPI & Exchange rate $> \pm 20\%$).

INDONESIA'S GEOTHERMAL FIT

- Indonesia's system of FIT as outlined in the MEMR's Regulation Nr. 22/2012 has been developed:
 - On basis of Avoided costs.
 - Not based on the actual levelized cost of renewable energy generation, plus stipulated return (set by the policy makers, regulators).
- Development costs for geothermal resources should be dependent on:
 - Size & enthalpy of the resources;
 - Differentiation of FIT payments to account for the differences in size and types or the choice of technology used can help the acceleration of small capacity geothermal field and low enthalpy resources.
- Geothermal FIT:
 - Japan:
 - Less than 15 MW: JPY 42.0 per kWh (USD 45 cents).
 - Greater than 15MW: JPY 27.3 per/kWh (USD 29 cents).
 - Germany:
 - Less than 10 MW: USD 0.226/kWh.
 - Greater than 10 MW: USD 0.148/kWh.
 - Plus incentives for using certain technology.

CONCLUSIONS

- MER's Regulation Nr. 22/2012 is a positive step to accelerate the development of Indonesia's geothermal resources:
 - FIT is intended to increase the adoption of geothermal technologies and provide significant economic development benefits for Indonesia.
 - FIT will provide guarantee and long-term policy
 - FIT should propel Indonesia to the forefront of the global geothermal industry.
- Second 10,000 MW Fast Track Program: 51 Geothermal Projects:
 - At a capped price of US 9.7 ¢/kWh, only geothermal projects with capacity above 110 MW or 2x55 MW are progressing.
 - With new FIT the remainder of geothermal projects is expected to move forward at accelerated pace.
- Development of FIT policy in concert with other energy policy, (goal for less dependency on oil-based fuel):
 - A properly structured FIT policy attempts to provide investor certainty to help support new supply development.
 - Redesigning FIT: combination of levelized & avoidance costs:
 - Plant capacity
 - Geographical location or type of technology employed.



Merci bien
Matur Nuwun
Hatur Nuhun
Obrigado
Dank
Thanks
Matur se Kelangkong

Syukron
Kheili Mamnun
ευχαριστίες
Danke
Grazias
Terima Kasih