



Renewable Energy: The Failure of the Malaysian 5th Fuel Policy

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1.0 INTRODUCTION

Renewable Energy has been endorsed as the 5th fuel component in the 8th Malaysia Plan (2001-2005)¹. An initial target of 5% of the industry generating capacity or 500MW by the year 2005 was set. Since its inclusions, there were only 62 applications for licenses, with a total capacity of 324MW, approved. However, planting up has been sluggish. All, have failed to take off, with the exception of a 2MW Landfill Gas Power Plant and a 10MW Biomass Power Plant, indicating the failure of the 5th fuel policy².

The primary reason, it seemed, was the (marginal) viability of the project due to low electricity tariff to be purchased by the Utilities. This, coupled with the higher foreign exchange rate for imported equipments, consequent to the Asian Financial crisis, and restrictive and stringent project loans, further dampened the viability.

A Research Survey³ was conducted in 2004 to gather response from industry players as to how they view the existing policies and financial incentives and, if grossly inadequate, its re-dress.

2.0 OBJECTIVES

The primary objectives of the Research Survey were to gauge the sluggish response of the industry players to the issue of planting up RE power plants as envisaged under the 8th Malaysia Plan and remedies for its re-dress.

The target respondents were stratified as follows:

- RE Developers (current holders of RE license from the Energy Commission)
- RE potential developers, namely Palm Oil Millers
- Bankers and Financial Institutions
- Government and semi-government agencies
- Existing Independent Power Producers (IPPs)

- Existing RE power producers (Malaysia, Britain, India and Thailand)

3.0 RESEARCH SURVEY

The responses of the various respondents could be summarised below:

Government's Response:

Government is not willing to subsidise RE generations. They would leave it to market forces to determine its own viability.

Banker's Response:

Bankers are keen to participate provided the projects are viable. The financial criteria that they are comfortable with are as follows:

- IRR of not less than 12%; preferred 15%-18%.
- Loan tenure of not more than 10 years.
- Equity contribution of not less than 20%; preferably between 25-30%.
- Interest rate between 5.0%-7%.
- Tariff of between RM 0.21 - 0.23 per kWh*.
- Must have clear and definitive long-term policy.
- Must have proper financial incentives.

In addition, Bankers are rather sceptical on the feasibility of present technology.

Deductions: The demands of the bankers could simply be met by an increase in electrical tariff to between RM 0.21 - 0.23 per kWh.

NB: This was based on a Total Project Cost of RM35mil. Since then the cost have gone up and the re-computed acceptable tariff would be about RM 0.25 per kWh to yield an IRR of 15%.

Palm Oil Miller's Response

The financial criteria that they are comfortable with are as follows:

- Project IRR should be between 15-18%.
- Tariff should be between RM 0.21 - 0.23 per kWh*.
- Interest rate should be between 3-5%.
- Equity contribution should be between 15-25%.
- Loan tenure should be between 10-15 years.
- Must have clear and definitive long-term policy.
- Must have proper financial incentives.

NB: During the structured interview most of the palm oil millers mentioned that they would only plant up if they get a good tariff of RM 0.25 per kWh. This is understandable as they are enjoying a lucrative return from the current high crude palm oil prices hovering at about RM1400 per ton.

Implications: Lukewarm response from the waste owners has very serious implications to the success of the 5th fuel policy. Millers are not willing to commit to a long-term fuel supply arrangement least other opportunities arises in the medium-term future.

RE Developer's Response

The financial criteria that they are comfortable with are as follows:

- Project IRR should be between 12-15%.
- Tariff should be between RM 0.20 - 0.23 per kWh*.
- Interest rate should be between 1-3%.
- Equity contribution should be between 10-15%.
- Loan tenure should be between 10-15 years.
- Must have clear and definitive long-term RE policy.
- Must have proper financial incentives.

Deductions: RE developers (non-millers) are willing to accept a lower return because of their comparisons with other projects such as property

development, construction, or IPP, that gives equal yield. However, the restraining factors are (i) lack of equity and (ii) inability to enter into a long-term Fuel Supply Agreement with the waste suppliers.

Comparison of these responses is shown in Table 1 below:

Table 1: Comparison of Responses

	RE Developers	Palm Oil Millers	Bankers
IRR (%)	12-15	15-18	15-18
Loan Tenure (years)	10-15	10-15	10
Equity (%)	10-15	15-25	25-30
Interest (%)	1-3	3-5	5-7
Tariff (RM kWh)	20-23	21-23	21-23

Population = 418; sample = 240; Cronbach's alpha reliability ratio = 0.7

The survey questionnaires were also constructed to focus on getting the key reasons that lead to the sluggish planting up of Renewable Energy power plants. This could be summarised as in Table 2 below.

Table 2: Main Reasons for Failure to Plant Up

Main Reasons for Failure of 5 th Fuel Policy	RE Developers	Palm Oil Millers	Bankers
1 st reason	Lack consistent and reliable supply of feedstock	Lack consistent and reliable supply of feedstock	Lack Financial incentives
2 nd reason	Lack Financial incentives	Restrictive REPPA*	Lack equity
3 rd reason	Lack equity	Lack Financial incentives	Lacks Clear policy

* REPPA – Renewable Energy Power Purchase Agreement

The main reasons for the failure of the 5th fuel-policy, in terms of importance, are as follows:

1. lack of consistent feedstock supply
2. lack of equity
3. lack of financial incentives

In addition, lack of clear RE policy (creating uncertainty) and restrictive REPPA was quoted as important but not listed as top three main reasons. Fuel procurement should, therefore, be of highest priorities since the biggest threat to a good operating record appears to be fuel availability (this was supported by the literature review). Fuel beneficiation, is indeed, the most important aspects of the whole process

of RE development. To overcome this problem the author suggests the following:

- Investigate multi-fuel sources of zero cost biomass and localised supply to reduce transportation cost.
- Establish contracts with biomass fuel supplier for a long-term supply.
- Investigate possibility of co-firing in

a hybrid system to increase plant efficiency during peaking period or period of low calorific value feedstock.

The “open supply” concept is the most practical strategy to overcome this

problem. This concept involves an “independent fuel supplier” who does not necessarily own the waste, but instead, has strategic alliances and networking to source for the biomass from multi sources. This concept could only be successful with a suitable (multi-fuel) biomass plant design that could take in various types of biomass supply, from plantation to construction waste, and from garden to forest waste.

From the above responses the following deductions could be made:

- From the IRR comparison it is clear that the palm oil millers expect a better return compared to the RE Developers simply because the return

of planting up another palm oil mill is much better than from a biomass power plant.

- The loan tenure expected by the developers is between 10-15 years whereas bankers are not keen for tenures to stretch out beyond 10 years.
- RE Developers were expecting a lower equity contribution of between 10-15% whilst the palm oil millers were comfortable at contribution of between 15-25%. The bankers however insisted on a higher contribution of not less than 25% preferably 30%.
- Every RE developers expects a soft loan of between 1-5%.
- The bankers, RE developers and the palm oil millers were expecting a tariff of RM 0.20 - 0.23 per kWh.

4.0 RECOMMENDATIONS TO ENSURE SUCCESS OF THE 5TH FUEL POLICY

This list of initiatives to make RE generation a success in Malaysia was derived as a result of structured interviews with various players in the RE generation sector from the RE generators to the Bankers and the government officers. From the discussions it was glaring that there was a strong need to (re)structure the industry properly otherwise the initiatives would not take off successfully and would thus kill the 5th fuel policy. The initiatives suggested are as follows:-

- **Mandatory:** The Government must make the present policy that 5% of industry capacity (estimated at 500MW) by 2005 be generated by RE to be mandatory obligation to Utilities. Failure to comply must be penalised (Must Take or Pay). These funds could be used to offset forex cost in planting up.
- **Tariff Fixation Committee:** Tariff = Utilities Component + subsidy (government) component. The bottom line is that the Project IRR should be fixed at between 15-18%, depending on the technology risk involved, to encourage more RE developers and re-investments. The tariff fixation committee should comprise one-half from government (Ministry of Finance and Ministry of Energy), the Utilities and Banks and other one-half from private sector (RE developers/

consultants). This committee should decide on the tariff for each and every proposal. The reference for this committee should be the IRR returns of the project. This must be equated to CapEx, OpEx, interest rate, loan tenure, tax holidays and import/sales exemption, feedstock price, etc. This committee should take into consideration the site situation, technology applicable, and the feedstock problems (and availability). This must follow the maxim that RE are site specific; technology specific; and feedstock specific.

- **Increasing Tariff:** Used to offset inflation as well as other government imposed increases. This should be fixed, at say 5% per annum applicable annually. The tariff purchased from these renewable energy generators have to be "nurtured". For example, the rates in the first 5 years of investment could be 2-3 times the present IPP rate. Initially, the rates have to be higher and involve an element of subsidy to accommodate debt servicing. As the industry matures these incentives could be gradually reduced/withdrawn and eventually tariff be fixed at "cost plus profit" basis decided on a case-to-case basis with IRR as the basis. As the industry matures even further, planting up could eventually be on an "open-bid" similar to European models.
- **Capital Cost Offset:** Grant - Because of the high forex rate (USD = RM3.8 vs 2.5 pre-Asian Financial Crisis) there must be some contribution by the government to offset the high capital cost due to the high foreign exchange rate. This can be reduced/withdrawn once the exchange rate is more reasonable.
- **Loan:** Appointed Banks such as Bank Pembangunan must provide for at least 80-90% project financing at a soft loan interest of between 2-3% for a longer tenure of up to 20 years. This would enable RE developers to make annual profits that would otherwise be taken up by repayments of loans and high interest payments. Islamic Bonds must make funding cheaper and easier⁴.
- **Better Investment Incentives:** Tax holiday should be for the full REPPA duration of 21 years. Import and sales

tax exemption should be given automatically together with investment tax allowances.

- **Dispatch:** Dispatch to the national grid should be on a "must-take-and-pay" basis. The inherent problem with renewable energies is the intermittency of feedstock which is not only inconsistent but also the quality, which is subjected to other (primary) factors and the weather (uncontrollable variables).
- **Restriction on Capacity:** There should not be any restriction on the capacity to be dispatched to the grid.
- **Interconnection Facilities:** Should be the responsibility of the Utilities.
- **Deregulation:** Distribution must be deregulated. RE generations should be allowed free-wheeling to consumers through the national grids. Distributed generations, must not be restricted only to biomass but also to other Renewable and Alternative Energies.
- **Research and Developments Efforts:** There must be adequate funds for R&D in all sectors of RE development from technology (solar to wind turbine) to feedstock (landfill gas to biomass). There must be full technical and financial support from the government for pilot plants using various feedstocks as well as using various technologies.

Government must not place any restrictions to any RE initiatives and must look at every case on its own merits. There must be a clear commitment by the various government agencies and lending institutions with regard to soft loans interest rates, advance margin and duration of project loan. There must be a diversity of fuel sources e.g. Landfill Gas, oil palm oil waste, sewage biogas, rice waste, timber waste etc., and also diversity of technology particularly locally developed or adapted (from foreign technology).

A wholesome approach would include setting up of a Renewable Energy Development Board to look not only at the implementation of guidelines and regulations in RE planting up proposed by Ministry of Energy, Water and Communication, and the Utilities, but also to look at cross-ministries efforts that would eventually involve the Ministry of

Science, Ministry of Local Government, and Ministry of Primary Industries and Ministry of Rural Development. The Board must also encourage aggressive techno-preneurial participation with assistance in equity financing, grant, soft loans and tax incentives. RE Generations, since it is dynamic and organic, should be a private sector initiatives performed by Techno-preneurs⁵.

The key word for a successful RE program is "localised": Feedstock must be localised; RE Technology must be localised; and distribution must be localised in a Distributed Generation configuration. This is true to the maxim of site specific; technology specific; and feedstock specific. Extensive R&D is key to this.

The National Energy Policy, besides emphasising the need to seek new areas of power generation or alternative generations, must also regulate the production of waste residues and its disposal into an integrated national scheme, so that its beneficiation efforts could be fully integrated with RE generations.

5.0 CONCLUSIONS

This research survey concluded that the reasons for failure to plant up Biomass Power Plant was primarily due to the intermittency in the supply of biomass feedstock coupled to lack of equity and financial incentives. The key word for a successful RE program is "localised": Feedstock must be localised; RE Technology must be localised; and Distribution must be localised in a Distributed Generation configuration. This implies the need for extensive R&D funding and other financial incentives.

In conclusion, the author suggests that grid connected RE power generation in Malaysia, with the present RE policy and financial incentives, is not a viable proposition. The only situation that would make RE generation viable is as follows:

- *captive consumers* or Distributed Generation particularly in an isolated grid system where the cost of electrical infrastructure from the nearest sub-station is prohibitive.
- *cogenerations* or combine heat and power with revenues from other by-products such as steam, heat and chill water for air-conditioning.

- *co-firing* using natural gas in a hybrid combine cycle co-generation to reduce unit cost by maintaining a high thermal plant efficiency and reducing intake of biomass fuels particularly during peak periods.

The success of the 5th fuel policy of the Malaysian government is of paramount importance to ensure that the country

remain a relevant and serious player amongst the industrialised nations, particularly in anticipation of a fierce competition in the future borderless world. As trade barriers are torn down the single most important economic consideration is the country's cost of power production. This would, in turn, dictate the competitiveness of the countries' produce in the globalised

market. Countries that fail to come up with their own version of alternative and renewable energies in the future will, forever, remain shackled to high cost fossil fuel technology slavery. Therefore, the current (SREP) programme as envisaged under the RMK8 should be thoroughly revamped, in its structure and content, for its inclusion into the RMK9 (2006-2010). ■

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