

RESPONSES TO THE WHEELING METHODOLOGY CONSULTATION

Dear Sirs,

Please see my brief comments on the OUR Electricity Wheeling Methodologies Consultation Document.

1. The document covers a fair amount of information and provides useful comparisons.
2. A discussion should be included to consider the pros and cons and context for (daily) intermittent renewables or seasonal intermittent generation (e.g. sugar factories) should have access to wheeling on the grid. I recommend that intermittent supplies should be added (within a capacity cap and total T&D system cap) due to their benefits of peak shaving and to improve line efficiency as distributed generation sources along the network.
3. I also recommend that the consultants provide the duration over which the pricing methodologies have operated in different countries (9.0) to allow an understanding of how novel the methodology is, how long it has worked and as sense of the maturity of the market using the methodologies. Jamaica would best apply a tried and proven methodology which can be adapted to market conditions.
4. I support the **MW-kW Load Flow methodology** with some historic pricing factored for a few reasons;
 - Postage Stamp methodology cannot account for potentially widely varied distances between generation and off-take and the "single price" is neither equitable nor transparent.
 - Contract Paths is more suited for a mature and sophisticated client who will negotiate with JPS (vis a vis the TSO) and places significant confidence in the utility.
 - MW-kW Distance Based methodology would be greatly preferred for its simplicity, ability of the client to compute and consider its costs, allows greater predictability accepting in an agreement for future wheeling locations however the **Load Flow methodology has an advantage** of adding estimated usage based on load/demand to the ultimate pricing.
 - Short Run Incremental Cost methodology does not consider the complexity of multiple transactions simultaneously and may disadvantage the TSO which has to make long term investment decisions.
 - Nodal Pricing methodology is suited for a complex, mature market accustomed to constant and dedicated monitoring of the electricity commodity in time within an electricity market. Jamaica's transition would be embryonic and not suited to this rapid transition. In any case it is hardly applied - a statement in itself.
 - It seems also that the country examples besides being mature also have other features such as cross border import/export which provides additional system security. Jamaica's island context may mitigate against choices such as Nodal and Contract Paths.
 - Perhaps two incremental costs should be added to the formulae; (a) for congestion and (b) long run marginal costs (considering the network is old) to determine the additive component of marginal operating costs (not on the line e.g. dispatch) and

to allow the beneficiary to share in the cost for long term investment for long-term system "commercial" stability.

5. Non-wheeling clients should be completely isolated from the additional costs of wheelers as they are not involved in this commercial transaction.
6. Wheelers should have a capacity floor/threshold to qualify to avoid unnecessary complexity to the system INITIALLY, as a natural constraint to the number of wheelers and also to reduce any inequities or discrimination in pricing for smaller wheelers.
7. Table 1 needs to allocate negative signs (-) for disadvantages and (+) for advantages to make the Score more understandable.

I hope these thoughts will add value to the current efforts.

Regards,
David Barrett

Dear Sirs,

I have devoted many hours of research toward assisting you and the Office of Utilities Regulation with solid information on which you could base your Wheeling Charge recommendation.

As I dug deeper into the variables and realizing the large number and types of relationships between the various stakeholders in a power delivery system, it became clear that it takes a tremendous effort of a large numbers of experts a long time to come close to produce a single document that works for everyone and every situation.

I did find that the country of Ireland has been working toward the stated goal and they appear to have a well crafted document concerning Wheeling charges.

The link <http://www.eirgrid.com/customers/gridconnections/transmissionuseofsystemcharges/> will take you to a page for their Eirgrid system.

I have attached their document called "Statement of Charges" for October 2012. This document gives a detailed breakdown of costs and conditions for the costs concerning Wheeling Charges.

The web page I included above has links for additional information particularly concerning the questions and answers that were received during their process of updating the Statement of Charge document attached.

Please become familiar with the information I have sent and I suggest this system of relationships be adopted with appropriate changes in cost accounting for the differing location and equipment.

Respectfully submitted

Bruce Langson
General Manager
American Patriot Solar Community
Las Vegas, NV, U.S.A.

Dear Sirs,

Thanks for the detailed consultation document. It was quite balanced in its assessment of the current electricity market and the balance that has to be achieved to benefit all concerned.

Following the consultation meeting and reading the consultation document we are in favor of the MW-km (Load Flow-based).

We (JBG) have a couple questions and considerations:

- Are there demand charges and if so how will this be factored in the wheeling rate?
- If supply of electricity is pushing reactivity would that be used to offset demand charges at point of use (in other words would VARS pushed offset VARS pulled)?
- What are the considerations for penalties and what conditions would result in a penal rate?
- Any considerations for rates based on connection points where the higher the voltage the better the rate?
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- What is the view of the OUR as it relates to wheeling of non-firm /firm renewables?
- Is there a limit to the quantity/size of the player in wheeling? E.g. can a 250 KW producer wheel? Or if we are wheeling 4.5 MW can we wheel to a variety of “take offs” who vary in size from 1.5 MW to 0.03 MW?
- In the event of congestion the agreement provides for cost recovery if an upgrade is needed. However the upgrade will also benefit JPS is the cost to upgrade shared proportionately?
- Will the MW/ KM method consider these regional specifics where upgrades may be required to facilitate some clients to wheel; is it that there is one universal “toll rate” / KM or is it that based on averaged capital costs there will be specific rates per wheeling client depending on where they are wheeling to?

Best regards,
Steve Palmer
Jamaica Broilers Group Ltd.

Dear Sirs,

I am Jamaican born Canadian who has an interest in the success of the Jamaican Economy.

WARNER - Wheeling Methodologies

If the general reason for establishing wheeling rates is to allow other generating facilities to operate then the rates should be established with the framework of having viable generating companies. This means that the rates should be based on a viable capital payback period and sufficient revenues to allow for efficient operations and maintenance cost and profits to allow for further capital expenditures for expansion and upgrades. This would allow for stable companies and stable power supply on the grid.

The grid access and transmission costs are paramount to obtaining the revenue, if the revenue source is very far from the generating source it is likely that the cost should be more than if the consumption site is closer. If no new equipment is required for transmission one would expect the wheeling cost to be marginal to the existing cost, however if new equipment is required then this cost should be either borne by the producer or amortized over the life of the wheeling cost contract. Since this will be different for different producers in size and type then it is not likely that the charge should be the same for all; unless there is a desire by the OUR to eliminate certain type and size from the matrix.

I would propose a rate for each region with higher rates in regions requiring more power generation or potential greater demand in the future. At this time consumption in rural areas maybe of a higher rate but OUR could promote a lower rate in these regions. This would stimulate the economy for rural locations and promote development of industry in lower power rates area. This will benefit companies in rural areas and help for the development of industry in these regions.

In regions where the consumption will only reduce the cost of power for the consumer and not promote any new industry then the cost could be higher and the savings lower. This will ensure that the existing customer base is not significantly eroded and may encourage upgrades be done in lower power regions.

The premise is that if power is purchased from JPS it would cost y and if power is self generated it would cost x . Wheeling to other consumers would mean $x < y$ and JPS would lose $y - x$ in revenue if there is no cost. JPS cannot afford to lose this revenue without compensation for the lost revenue and use of the grid. However, one should note that most of the operating cost and profit from JPS goes outside of the country and does not impact on GDP except to make the cost of Jamaican goods and services more expensive. This would be the case for existing customers. However for new customers there is only potential lost revenue which would be at the additional cost required for the potential revenue. Consequently the cost to JPS would be different. For example if the additional power required was more than the current capacity the additional cost to JPS would be significant because it would require significant capital investment as well as

possible additional transmission lines. On the other hand if the additional proposed new load is marginal with no requirement for additional capital expenditure the cost is only marginal cost of service.

Since one of the criteria is to use indigenous materials it would imply that preferential rates should be given to indigenous materials so solar being indigenous to the tropical regions and a free source should be preferred. Although most of the solar infrastructure would be imported, it would not be any different for others. The great advantage of solar to Jamaica is that the life of free solar is almost guaranteed for the next 25 years while other renewable source is not as certain. For example biomass raw materials supply maybe subject to hurricanes and transportation issues.

Also, since the agreement with JPS expires in 15 years; renewable sources which are certain should be preferred over the next 15 years.

Discretionary pricing is required to balance the cost; since this is the case it is more likely that regions be treated as consumption zones and of the same cost. All generation in one zone is the same. Network losses and congestion are difficult to address for all generators small and large so it would be best to have a fixed cost for this at least in each region.

In conclusion prices should be favourable in regions that would promote development as this would add directly to GDP, prices maybe a little higher in existing high consumption regions but low enough to reduce cost which would add to the profit margins of existing locations and also improve of the GDP of the nation.

Yours Truly,

**R. Anthony Warner, P.Eng., Consulting Engineer, F.E.C.
President & CEO**

Dear Sirs

Response of the Ministry of Science Technology Energy and Mining to the Electricity Wheeling Methodologies Consultation Document

1. The Policy Background

1.1 The policy position of the Government of Jamaica with respect to the energy sector is encapsulated in the National Energy Policy 2009-2030 (NEP). It is in this policy that the Ministry of Science, Technology, Energy and Mining (MSTEM) grounds its comments on the Consultation Document on Electricity Wheeling Methodologies.

1.2 The NEP calls for the development of:

A modern, efficient, diversified and environmentally sustainable energy sector providing affordable and accessible energy supplies with long-term energy security and supported by informed public behaviour on energy issues and an appropriate policy, regulatory and institutional framework (NEP, p. ix)

1.3 The fundamental elements of this long term vision include, inter alia:

*An energy sector that is focused on the **modernization and expansion of the energy infrastructure** (e.g. generation, transmission and distribution systems) to ensure **safety, affordability, reliability and competitive advantage***

*An energy sector that is driven by private sector investment within a policy and regulatory framework that fosters **investments, competition, efficiency, a level playing field and transparency***

*An energy sector that provides long-term energy security to producers and consumers in Jamaica, including security of supply and, to the fullest extent possible, **long-term price stability** (NEP, p. ix, emphasis added)*

1.4 The NEP therefore aims to establish an energy sector with modern infrastructure that is secure, affordable, reliable, conducive to competition, and attractive to investment.

1.5 With particular reference to wheeling, policy requires that studies be conducted

... to include net metering and wheeling in the tariff rates and introduce appropriate mechanisms for net metering and wheeling procedures and standards to encourage the development of renewable energy and cogeneration opportunities (NEP, p. 38)

1.6 **This underscores that wheeling is intended to facilitate investment, particularly with respect to renewable sources of electricity.** The distributed and occasionally remote nature of renewable resources benefits greatly from a regulatory means to affordably wheel power. Furthermore, by enabling new kinds of electricity projects, wheeling regulation can encourage investment

1.7 Given the forgoing, and the Government's embrace of competition and liberalization, there is a clear vision of what should obtain once wheeling regulation is promulgated

and wheeling transactions become a feature of the Jamaican electricity sector. The vision is articulated in policy and guides the Government's actions in the implementation of a wheeling framework.

2. Considerations

Harmonizing Policy, Law, Regulation, and Investments

2.1 MSTEM notes that a number of policy initiatives, regulatory initiatives, legal changes, procurement activities and studies will be occurring in the short term. These include:

- a study of the grid impact of renewable energy, to be completed in 2013;
- the development of a roadmap for the implementation of smart grid infrastructure, to be completed in 2013;
- the development of an Electricity Policy and an updated Electric Power Act in 2013;
- the ongoing procurement of renewable energy capacity, scheduled to run from 2012-2014; and
- the continuation of the net billing programme.

2.2 All these activities have clear interactions with a wheeling framework. We note that greater coordination is needed between the policy, legislative, regulatory, and investigative work being done by the Government and its agencies. For example, it is unfortunate that participants in the current 115 MW tender do not have the benefit of wheeling as a consideration.

Encouraging Competition and Ease of Entry to the Market

2.3 It is the policy of the Government to encourage competition and increase access to services in such a way that investment is encouraged. With this in mind, wheeling regulation must facilitate ease of entry into wheeling transactions.

2.4 Attention must be paid to the fundamental issue of costing methodologies and cost allocation. When the OUR makes its determination on costing methodologies, particularly when weighing marginal versus incremental costing methods, the encouragement of investment and the promotion of the market must be a prominent consideration. A framework which does not encourage investment, or which does not facilitate a diversity of wheeling transactions, or which allocates excessive costs to potential wheeling transactions, would be fundamentally flawed.

- 2.5 The final determination of the OUR on wheeling will inevitably involve choices regarding the appropriateness of one methodology over another. In making these choices, and in the subsequent administration of the wheeling framework, the OUR should avail itself of the most modern techniques and modelling tools, and making the fundamental principles of these tools and techniques as plain as possible to stakeholders. The quality of modelling tools and of the information used by such tools will directly affect the quality of the wheeling framework.

Facilitating Infrastructure Investment

- 2.6 The implementation of wheeling in accordance with policy and in a technically sound manner may require upgrades to existing grid infrastructure. In particular, for the facilitation of renewable energy, intermittent generation sources, intermittent loads and more dynamic management of the utility grid system, smart grid infrastructure may be a necessary condition.
- 2.7 To enable such infrastructure investment while facilitating the fair recovery of costs, the OUR should make provisions for necessary system upgrades in its tariffs in a forward-looking manner. Such forward-looking provisions could be a part of a wheeling tariff based on long run costs.
- 2.8 It is noted that the OUR is proposing a historical method of pricing, rather than forward-looking method of pricing. If this is the choice that is made, then the OUR will have to ensure that other elements of the regulatory regime will enable and encourage the necessary investments in infrastructure that must occur.

Ensuring Consistency and Fairness in Price Determinations

- 2.9 MSTEM notes that the OUR acknowledges the need for consistency of the wheeling tariffs with extant tariffs and price controls. MSTEM is especially concerned that there should be no over-recovery of costs. It is expected that there will be transparency in the final pricing structure, which will provide the necessary investor confidence.
- 2.10 MSTEM notes that there was no clear treatment of tariff revisions in the consultation document. It is expected that, as the utility grid is upgraded and various electrical loads are added to or taken from the system, the cost of a given wheeling transaction will change over time. Tariffs will therefore need periodic adjustment in order to remain cost reflective. In the final determination on wheeling, it is expected that the OUR will promulgate the procedure, mechanism and timetable for the revision of wheeling tariffs.

- 2.11 It is expected that the introduction of wheeling will bring substantial systems benefits to the utility grid, particularly if the OUR adheres to the principle of promoting economic efficiency. The OUR has already recognised that, through refinements in the load flow-based pricing model, appropriate price signals may be provided to encourage transactions that reduce net power flow, up to and including a deferral of charges. The OUR should consider whether, rather than imposing a floor on such transaction costs, a mechanism should be devised for the sharing of the benefits of particular transactions.

Providing Necessary Stand-by Services to Bolster Intermittency

- 2.12 Given that no power system is absolutely reliable, that renewable generation systems may be intermittent, and that the demand at a consumption site may not match the production at the generation site either in magnitude or in time, an adequate wheeling framework must include provisions for stand-by and top-up services. When a power generator which is wheeling to a consumption site becomes unavailable, whether by fault, scheduled maintenance or resource availability, then the power utility must seamlessly provide the services needed by the consumer.
- 2.13 The provision of necessary services must be done in a manner that facilitates investment. The charges for such services must be fair and transparent, and double counting should be avoided. In particular, it is important for the OUR to consider whether the necessary provisions for these services are already made in the existing tariff structure or interconnection agreements. This is especially so in the case of small transactions that have minimal or no negative stability impact to the utility grid, and which require minimal or no incremental capacity investment.
- 2.14 Clear and equitable commercial arrangements for services must accompany the promulgation of wheeling regulation. The OUR must adequately monitor the commercial terms for these services to ensure the fair reflection of costs and the equitable allocation of risks. This may require the OUR to make distinctions between classes of consumers based on the size of generation capacity.

Conclusion

- 3.1 MSTEM awaits the timely action of the regulator in the establishment of a wheeling framework in Jamaica.
- 3.2 The creating of a wheeling framework is driven by a National Energy Policy that encourages modernization and investment. The framework that the regulator will establish must meet the standard set out in policy.

- 3.3 MSTEM expects the final promulgation by the regulator of a harmonious wheeling regime that encourages participation and investment from all stakeholders. Such a regime must be clear, fair, efficient, and administered with adequate procedural and commercial arrangements.

Regards,
Gerald C. Lindo
Senior Energy Engineer
Ministry of Science, Technology, Energy and Mining
36 Trafalgar Road, Kingston 10, Jamaica

Dear Sirs,

The following are my observations on the subject matter.

1. There seems to be some slight typographical error in section 4.0 on Cost Recovery

4.1. This may be interpreted as " a number of costs components may be legitimately recovered through wheeling" or " a number of costs may be legitimate and can be recovered".

Can you please specify what was intended.?

2. The analyses seem commendable and comprehensive enough especially as the practices and experiences of some key industrialized countries have been included.

I think that one would have wished to see some calculations of a real case study for Jamaica targeting selected and specific power supplies and locations.

This would then generate the typical or indicative price in US\$ per Mw-Km.

If I am not mistaken,I saw in one of our recent daily newspapers where the NWC representative stated that a price of even .03 US\$ per kwh for this planned power wheeling may enable them to save Billions of J\$ with their planned power wheeling project.

3. What would be a typical cost per MW - km or kW - km for a domestic solar system at known source and point of distribution or take off in Jamaica?
4. Finally, would GIS /GPS technology and data be useful in determining the distances and locations involved in the calculations?

It may be assumed that this GIS/GPS technology is readily accessible since it may have been previously acquired for use by JPS and some of its potential clients.

Regards

Lance White
Head, Engineering Department
SIRI
