USAID
FROM THE AMERICAN PEOPLE

UPDATE ON 'THE WHEELING FEE' WORK PROGRAM

SUSTAINABLE ENERGY FOR PAKISTAN (SEP) PROJECT

November 27, 2020

PURPOSE AND OUTLINE

Objectives of the Presentation:

- Describe the overall status of the work program
- Summarize work that has been recently completed
  - Treatment of Renewable/Intermittent Resources
  - Role of Specialized/Responsible Entities
  - Treatment of the Cross Subsidy Surcharge

THE WHEELING FEE WORK PROGRAM

- The objective of the work program has been to assist NEPRA with the derivation of various components of the wheeling fee.
- In large part the outline of the work program was established by the LUMs Conference which took place in December 2019. At that conference, the participants identified nine specific issues that needed to be addressed with respect to the wheeling fee:

Stranded Assets Cost	NTDC Use of System Charge*	Network Losses*
Economic Dispatch*	Hybrid BPC*	Banked Energy*
Cross Subsidy Surcharge	Wheeling From Renewables*	Role of Specialized Entities*

Submitted

* Dependent on choice of electricity market design

COMMON PRINCIPLES FOR DEVELOPING THE WHEELING FEE

- Counterparties to a wheeling transaction should not be able to avoid or escape appropriate costs.
- The wheeling fee should be consistent with the principles of short and long-term economic efficiency. And should send the correct investment signals.
- The incentives produced by the wheeling fee should promote reliable operation of the electricity network and economic efficiency.
- The methodology by which the wheeling fee is calculated or updated should be known in advance.
- The wheeling fee should be understandable, transparent and replicable.

TREATMENT OF RENEWABLE/INTERMITTENT RESOURCES

- The concept of "firm capacity" has no operational meaning with respect to intermittent resources.
  - The system operator cannot rely on a "scientific study" in real time to operate the system reliably.
  - It is one thing to determine "firm capacity" for purposes of contracting and quite another to reliably operate a system that has intermittent connected generation resources.
  - Any difference between the firm capacity from a probabilistic "scientific" study and what is actually happening in real time, will require the system operator to intervene.

TREATMENT OF RENEWABLE/INTERMITTENT RESOURCES - RECOMMENDATIONS

- The intermittent nature of renewable reserves requires the System Operator to carry additional operating reserves in order to maintain reliable operations.
- The Grid Code should be reviewed to ensure that the reliability guidelines reflect the added volatility of the generation mix.
- Until nodal pricing is implemented, we recommend requiring intermittent generation to schedule their output one hour in advance of real time operations for every operating interval.
- Deviations between the scheduled and actual amounts will be absorbed by the wider grid, i.e., other generators will be ramped up/down on a reliability and economic basis to absorb the deviations.

ROLE OF SPECIALIZED/RESPONSIBLE ENTITIES

- The actual functions to be performed in operating an electricity market are largely the same regardless of the specific market design.
  - Market design significantly matters is in prescribing specifically ***how*** the functions will be carried out.
    - For example, if the dispatch function will be based on Security Constrained Economic Dispatch, has fundamental and significant implications for the scope and scale of the function.
- The role of responsible entities is intimately tied to the specific market design.

ROLE OF SPECIALIZED/RESPONSIBLE ENTITIES - RECOMMENDATIONS

- Given that there is no recommended market design from which to evaluate the specific role of entities, we make the following general recommendations:
  - Identify and define all functions/activities necessary to operate the eventual electricity market.
  - Develop a detailed methodology describing how the function is to be accomplished.
  - Assign all activities to either the System or Market Operator (if necessary).
  - DISCO's should be focused solely on the physical operation of the low voltage network. Accordingly, they should have no relationship with the electricity market.
  - Regardless of the initial market design, legacy decisions regarding the institutional structure should not hamper the efficient evolution of the electricity market.

TREATMENT OF THE CROSS SUBSIDY SURCHARGE (CSS)

- The intent of implementing a cross subsidy is to mitigate the costs of electricity – primarily to low-income consumers but also in some cases to industrial customers in the hope that lower electricity costs will spur economic activity.

- By definition, the act of discriminatory pricing necessarily creates an incentive for those who pay the subsidy to exit the system. The intensity of the incentive depends on the size of the subsidy, how the subsidy is accomplished and the specific laws and rules that are in place.

TREATMENT OF THE CROSS SUBSIDY SURCHARGE (CSS)

- Maintaining cross subsidies when there is no open access is possible as long as the cost of the discriminatory pricing is less than the cost of physical self-supply.

- Electricity demand is not perfectly inelastic.

- Implementing open access changes the situation by allowing consumers, and in particular those paying for the subsidy, to bypass the usual routes through which the subsidy is funded. Depending on the mechanism by which the subsidy is funded this "leakage" can largely be avoided.

TREATMENT OF THE CROSS SUBSIDY SURCHARGE (CSS) – TWO STEP PROCESS

- There are two separate and sequential steps in determining the CSS:
  - Determine the optimal amount of the subsidy, and
  - Determining the allocation method both in terms of who receives the subsidy and who pays for it.

TREATMENT OF THE CROSS SUBSIDY SURCHARGE (CSS) – RECOMMENDATION FOR THE FIRST STEP

- With respect to the first issue – the determination of the optimal level of the subsidy – providing the subsidy is akin to a transfer payment from one set of consumers to another. In effect, the subsidy is a redistribution of income from those paying the subsidy to those receiving it. Determining the optimal transfer is a relatively straightforward exercise:
  - Determine the optimal level for the subsidy by finding the subsidy where the marginal loss in welfare suffered by those who are responsible for paying the subsidy equals the marginal gain in welfare by those who receive the subsidy.

TREATMENT OF THE CROSS SUBSIDY SURCHARGE (CSS) – RECOMMENDATION FOR THE SECOND STEP

- Once the amount of the subsidy has been determined the next step is to decide how to allocate the costs:
  - The first-best solution would be to make the subsidy a type of "income assistance" that is funded through a tax on perhaps income. In this way the subsidy would have no relationship to electricity prices and would avoid the two fundamental problems discussed above.
  - The second-best solution is allocate the costs of the subsidy through a fixed cost rather than a fee based on usage. While not as efficient as the first-best solution, this mechanism does avoid much of the inefficiency caused by the distortion in prices when applying the subsidy on a usage basis.
  - The third-best mechanism involves allocating the subsidy on the basis of usage through the price of electricity. This necessarily distorts electricity prices and leads to the most inefficiency.

SUMMARY AND CONCLUDING REMARKS

- The act of "wheeling" electricity represents an important and foundational first step in implementing open access.
  - Wheeling is not, nor should it be, an "incremental" change.
- Wheeling raises a number of important issues – many of which (but not all) were raised at the LUMs Conference – with respect to current operation of the electricity system.
- Putting in place a wheeling fee that is unbiased, transparent, and efficient is critical for the ultimate success of implementing open access.
- The wheeling fee regime needs to capable of evolving as the market grows and changes.
- Wheeling is not an "end state." Rather it is an intermediate step.
  - With the implementation of Nodal Pricing there should be no need for "wheeling."

THANK YOU

USAID
FROM THE AMERICAN PEOPLE