Integrated Resource Planning Training for Decision Makers

Day 8, Session 15 Implications for IRP of wholesale market

17 March 2021
Who cares about wholesale electricity markets in SADC?

- In most SADC countries, there is a vertically integrated utility or a single buyer and an IRP guides investment in generation or procurement choices by the single buyer.
- With a competitive market – generation investments are made by the market.
- So, does an IRP still have a purpose?
- First, what is a competitive market?
Malawi’s single-buyer model

- Five licensees:
  - Generation,
  - Distribution,
  - Transmission,
  - Single Buyer (SB) and
  - System and Market Operator (SMO)
How does a (semi-)competitive market work? Example of the Modified Single Buyer (MSB) model in Namibia (bilateral trade)

Existing arrangement

New arrangement

Source: MSB presentation by ECB, June 2019

Phase 1b
Other variants are possible

- Namibia’s market arrangement is called **bilateral trade with a residual balancing market** also called a Net Pool (SAPP also has this arrangement)

- The other arrangement is to have a **mandatory pool** also called a gross pool
  - This arrangement is in place in some countries of the EU (e.g., Ireland) and in Asia Pacific
  - All generation must sell to the pool and all consumers must buy from the pool
  - Financial contracts can be agreed to run in parallel with the mandatory pool called contracts-for-differences
Some other countries moving in this direction?

- **Nigeria** has created the framework (legislation and detailed rules) for bilateral trade, but it is currently operating a single-buyer model; the same is true in **Egypt**
- **South Africa** introduced legislation in ~2010 but it was not implemented; possible moves in this direction
- The legislation is in place in a number of other countries (Lesotho, Rwanda, etc) but never implemented
- Some have a very limited form of bilateral contract market - **prosumers**
- For most SADC countries, the question is irrelevant - only Namibia currently has a competitive wholesale market
- But the day may come …. SAPP market is gradually becoming more sophisticated
- **So, does an IRP still have a purpose in countries like Namibia?**
Purposes of IRPs when there is a competitive market

- **For the single buyer:** To guide, not determine, the investments that the single buyer/national utility should undertake/procure

- **For the private sector:** To guide private investors around the opportunities for power generation investments

- **For the transmission/distribution companies:** To guide the network owner/operator toward the parts of the transmission network that should be reinforced

- **For the regulator:** To help to guide the regulator in determining which power plants, and the associated capital expenditures undertaken by regulated utilities, are reasonable and should be allowed in the electricity tariff review

- **For the Ministry:** To guide policy by analysing the cost consequences of various policy choices and how policies should be best implemented
For the **Single Buyer** when there is a competitive wholesale market

![MSB Production Chart](image)

- **MSB production as part of total energy supplied**
- **GWh**
- **Years:** 2021 to 2030
- **Sales forecast** and **MSB supply**

*Modified Single Buyer (MSB) for Namibia*
Will the **Single Buyer** rely on the national IRP?

- The single buyer will be the supplier of last resort
- Eligible consumers may prefer to buy from the single buyer
- Or the IPPs may default and consumers may return to the single buyer
- The single buyer will therefore face uncertainty over the load that it must supply
- The single buyer will therefore prepare its own IRP for the market that it expects to supply
The IRP tells the private sector what is needed by the system
For the **network companies** (or Independent System Operator if the ISO determines grid extensions) in exactly the same way whether there is a single buyer or a competitive wholesale market.

The IRP tells them where generation is likely to be developed and what parts of the network should be reinforced.
For the **System Operator** – ancillary services

- (The System Operator may be part of the Transco – its role is short-term dispatch, grid planning and long-term planning of grid reinforcement)
- It will also contract for ancillary services
- Will there be a market for ancillary services?
- The IRP may also inform the System Operator on what ancillary services are required:
  - Primarily frequency reserve if high penetration of intermittent energy expected
  - Need for battery storage and other fast response reserve
  - Inertia
For the Ministry the IRP is used to assess policies

Examples of policies and programmes that might be informed by the IRP:

- Placing constraints on the intermittent solar to be developed by the private sector
- Incentives to promote renewable energy by the private sector
- Constraints on the use of fossil fuels
- Security of supply (e.g., will there be over-dependence on imports?)
- DSM policies (promoting LED lightbulbs, solar water heaters, etc.)
Policy choices (examples from Malawi last week)

- **Concerned about extended periods of low flow on the Shire River?**
  - Force an increase in diversification by advancing non-Shire hydro (Fufu and Songwe), bring forward Pamodzi coal, and delay Mpatamanga and Hamilton Falls - this will cost an additional $121 million in PV terms (+1.8%)

- **Happy to accept full optimisation and greater dependency on imports?**
  - Postpone Lower Fufu, Hamilton Falls, Kholombidzo, Pamodzi and generic coal – this will save $9 million in PV terms (-13%)

- **Unwilling to interconnect with Mozambique?**
  - This will cost an extra $194 million in PV terms (+3%)
  - And no insurance against delays in power plant construction or low flows on the Shire River
Conclusion - does an IRP still have a purpose?

- The purpose changes subtly
- But the purpose is fundamentally the same – policy and investment planning (now guiding rather than dictating)
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