Integrated Resource Planning Training for Decision Makers

Day 8, Session 15 Implications for IRP of wholesale market

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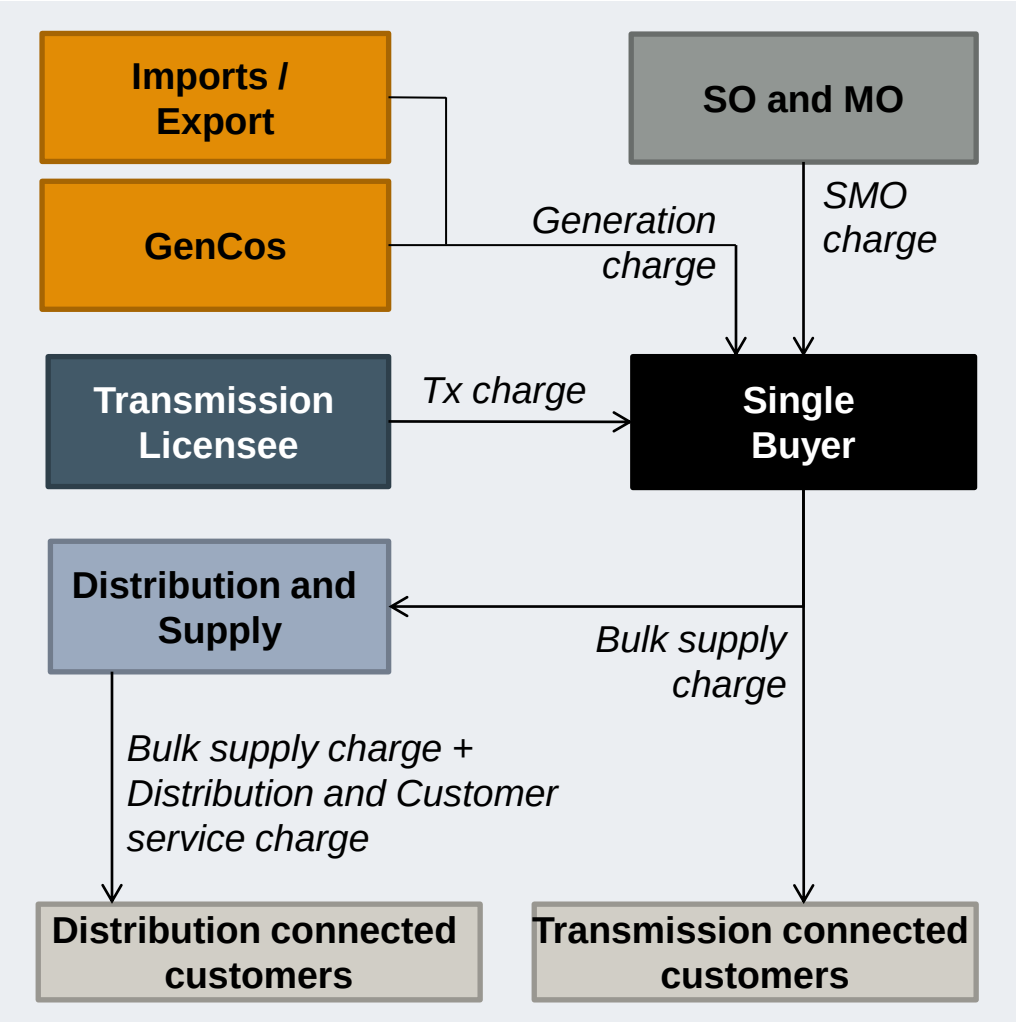
Who cares about wholesale electricity markets in SADC?

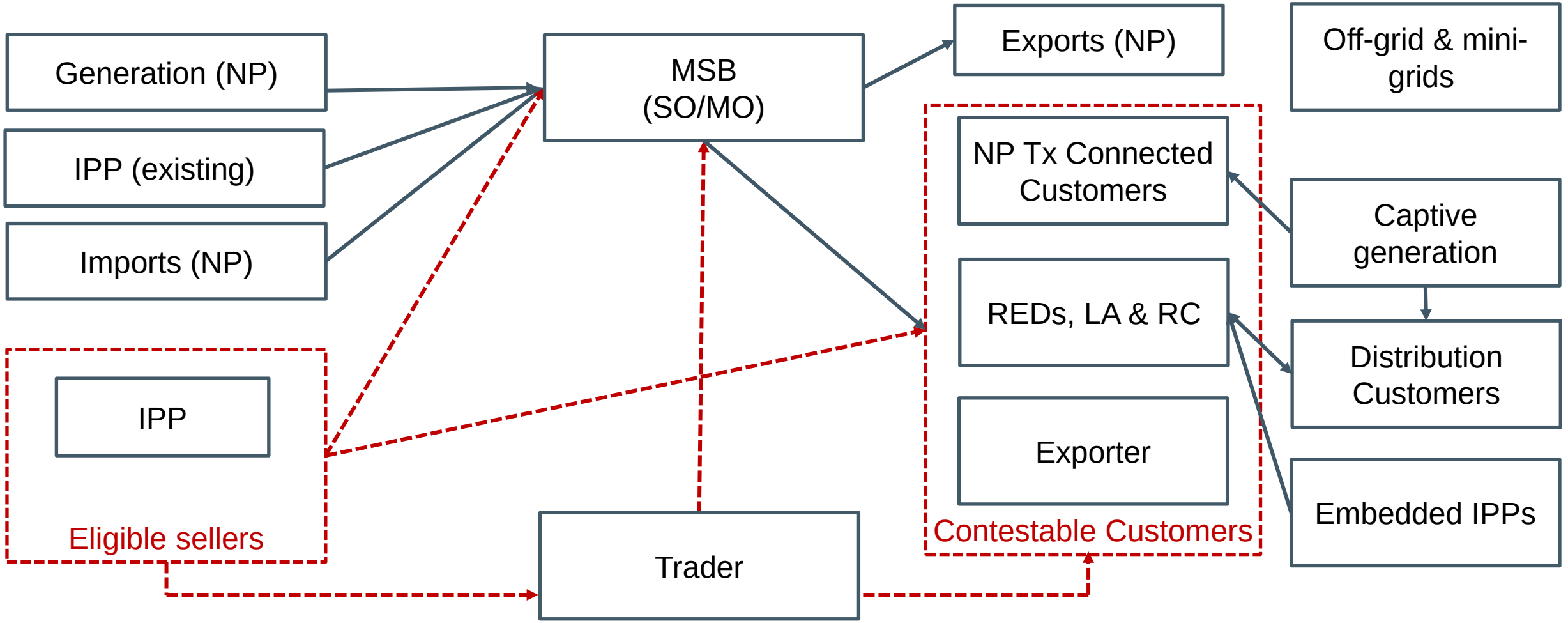
- In most SADC countries, there is a vertically integrated utility or a single buyer and an IRP guides investment in generation or procurement choices by the single buyer
- With a competitive market – generation investments are made by the market
- **So, does an IRP still have a purpose?**
- First, what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

Malawi's single-buyer model

- **Five licensees:**
  - **Generation,**
  - **Distribution,**
  - **Transmission,**
  - **Singe 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)



Phase 1b
Source: MSB presentation by ECB, June 2019

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

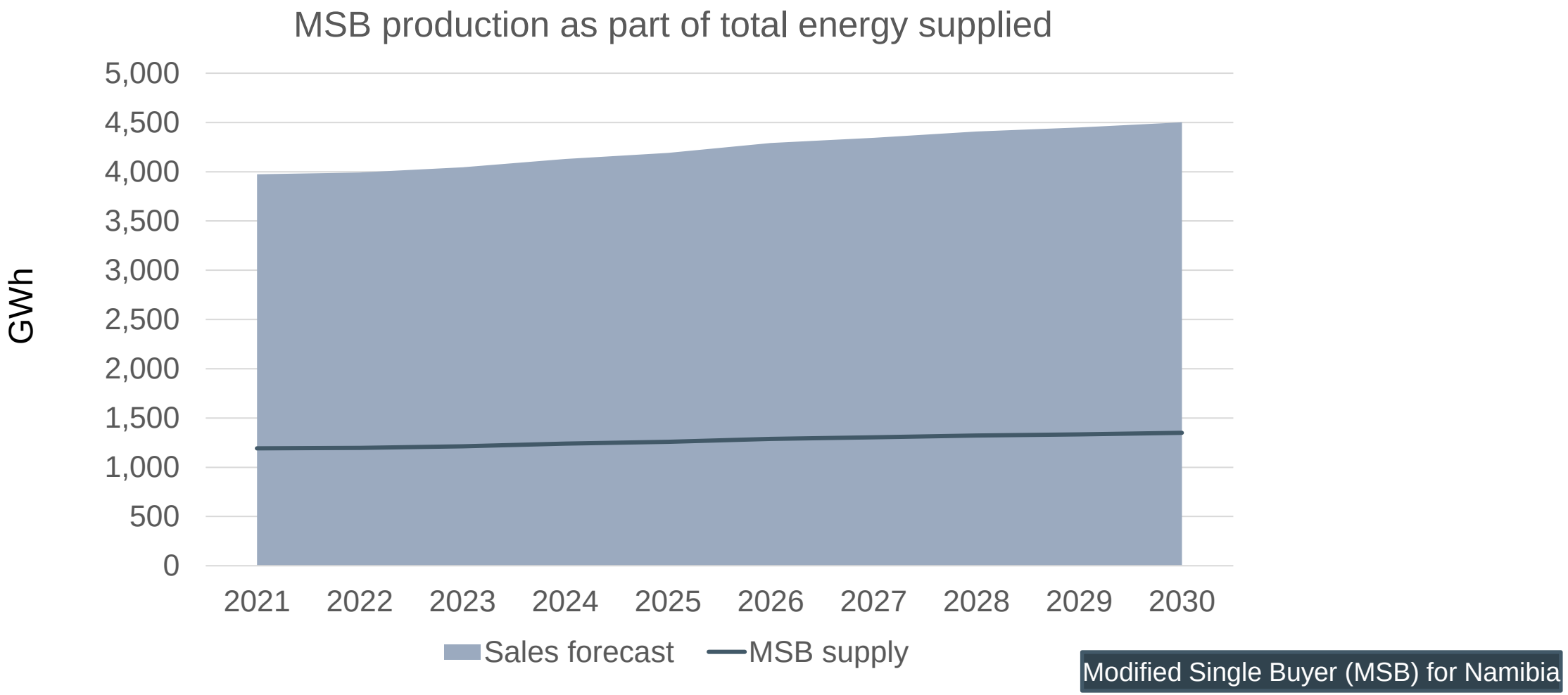
Some other countries moving in this direction?

- **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

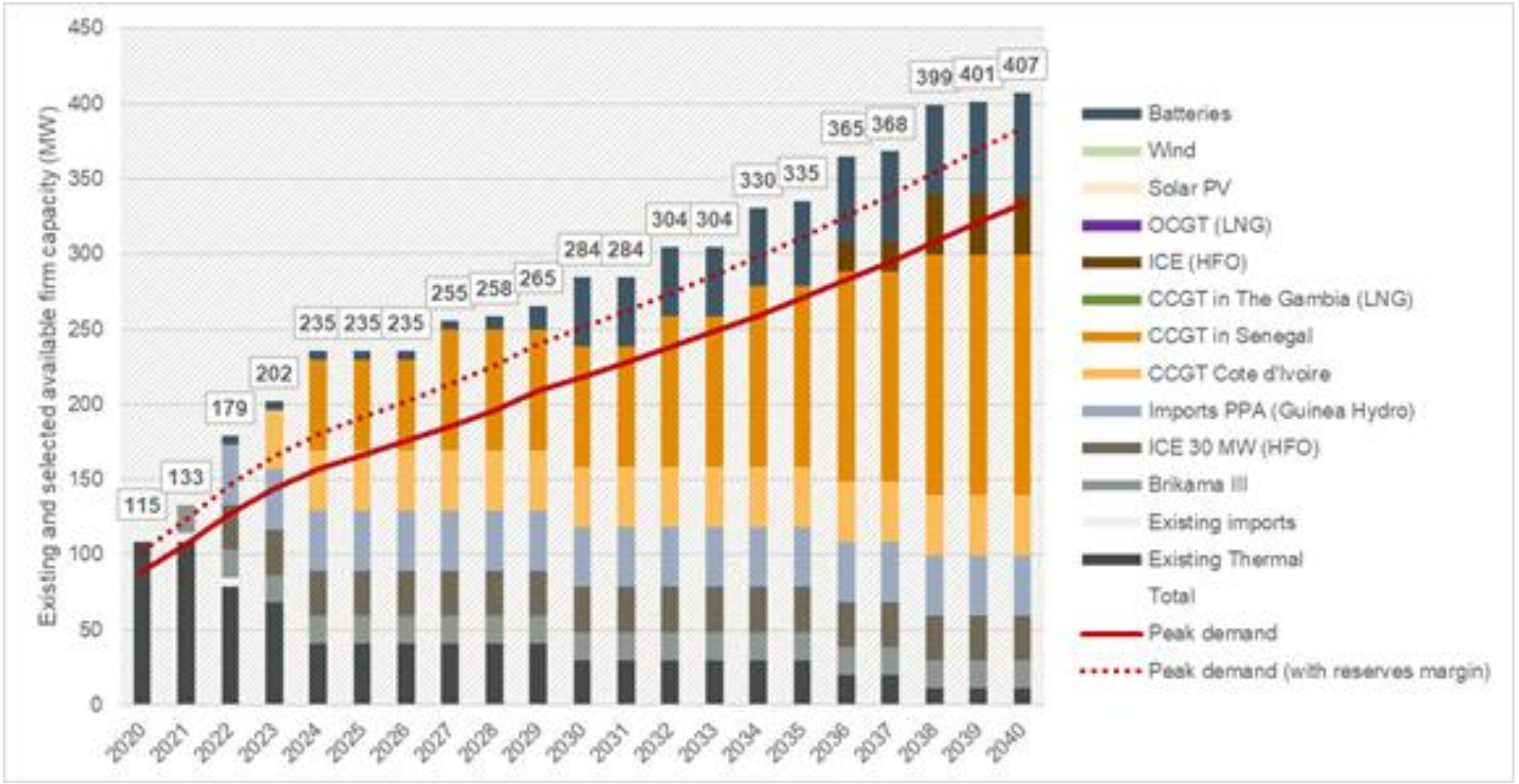


Modified Single Buyer (MSB) for Namibia

Will the Single Buyer rely on the national IRP?

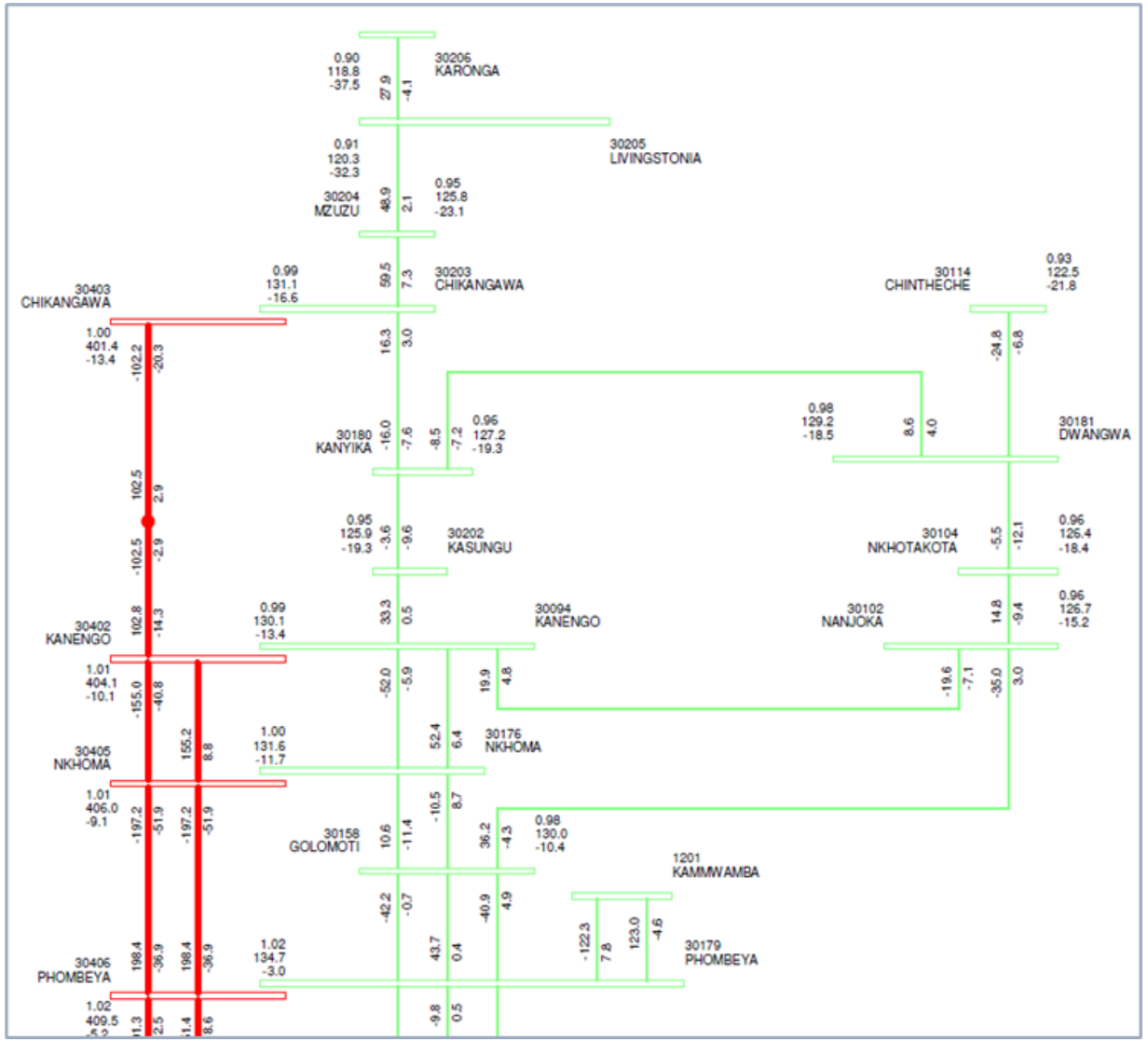
- The single buyer will be the supplier of last resort
- Eligible consumers may prefer to buy from the single buyer
- Or the IPPs may default and consumers may return to the single buyer
- The single buyer will therefore face uncertainty over the load that it must supply
- The single buyer will therefore 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

- The IRP is used by 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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