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SAESA South African Energy Storage Association

PLENARY SESSION 1
POLICY AND REGULATION: THE ROAD AHEAD FOR ENERGY STORAGE

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Defining Energy Storage

Energy storage is not a primary energy source.

Energy storage's most useful feature is that can change the time that the output from any cost effective primary energy source gets used.

When low load conditions on 'baseload' generation leads to inefficiencies, energy storage can synthesize load to optimize the generation

When excess renewable generation may lead to curtailment, energy storage can soak up the excess, reducing wasted generation

When there is shortage of real-time generation, energy storage will fill the gap

Status Quo

In the interim, the DMRE and NERSA consider energy storage the same as generation from a registration and licensing perspective

There is no formal national policy or ‘white paper’ on energy storage as yet

The current IRP does not recognize the additional benefits of distribution network embedded energy storage. We do need an updated IRP soon...

The Battery Energy Storage Grid Code (BESS) does deal with the technical aspects of grid connection – it is also a bit thin on re-charging parameters

Municipal by-law regulation so far has been reactive and restrictive rather than supportive, e.g. the issue of by-laws for hybrid PV and UPS systems to prevent re-charge immediately following a load shed

BESS grid code predominantly details technical requirements for generation mode

The BESS grid code sets out the technical requirements for battery (inverter based) energy storage systems as per capacity categories

- Response to system voltage and frequency deviations
- Required control modes, active and reactive power
- Remote control functionality for managing control modes, input and output constraints
- Detail of SCADA measurement, status and control signals
- Power quality requirements
- Protection and fault current requirements
- Non-compliance issues
- Data and simulations for grid connection engineering
- NERSA performance reporting

Evolution of the EDI

New technologies, including energy storage systems, are paving the way for everyone to play a part in creating a new integrated, working electricity system.

It does not matter who owns the energy storage assets connected to the distribution grids – as long as their use is co-ordinated, everyone benefits!

The need for regulation

So, regardless of who owns the energy storage assets –

- The activity of storing and releasing electrical energy needs separate recognition with rules and regulation to ensure the energy system as a whole will benefit
- Fundamental energy storage policy and regulation is needed to control when to charge and when to discharge for *system* stability and efficiency
- Tailored location and use case dependent sub-regulation is also needed to promote commercialization and investment security
- Regulation and rules for aggregation are also needed

The right degree of regulation

When developing their regulatory framework, the Namibian Regulator considered that -

A *robust regulatory framework should be characterised by the following:*

- *Simplicity, employing a light handed and consistent regulatory approach,*
- *encouraging the uptake and use of ESS, creating regulatory certainty,*
- *levelling the playing field for ESS compared to other grid assets (generation and other) of electricity supply,*
- *flexibility, allowing for and enabling innovation,*
- *protecting consumer interest,*
- *not unnecessarily burdening the regulator's capacity and others.*

Good correlation between Tx connected, bulk Dx connected and behind the meter connected storage facilities

Transmission connected storage (such as the Ingula pumped hydro scheme) predominantly provides ‘baseload generation’ support only

Embedded, distribution connected storage contributes to the above, plus Tx and Dx network de-loading support, plus bulk energy cost containment

Behind the meter storage, with the right signals, makes a contribution to all of the above, also improves local premises security of supply and reduces final end use energy costs

Relevant rules and regulation is needed to define the commercial contracts for the above that will promote investment

Distribution aggregation and diversity benefits

The distribution industry takes advantage of the load diversity that comes with the connection and aggregation of many different types of consumers

There is also a diversity benefit that comes with the connection and aggregation of many embedded generation or embedded energy storage systems (DERs)

This enables the relaxation of unreasonably punitive demand contract terms for ‘missing the absolute peak’ for example

A different currency

If an electricity distributor or reseller purchases an energy storage system (or service) and it is not generation, then what is it?

In essence, they are purchasing a Load Management Service

The currency is not plain kWh, but rather –

Demand reduction (kW) x duration (hours and minutes),
Provided at the contractually agreed time and dependent on re-charge energy availability

The rules are different to those for dispatched generation

Indirect regulatory issues, storage as a service to the Electricity Distribution Industry

MFMA and Tariff Regulatory constraints

- Contract term limit (MFMA Section 33 exemption, same as for PPA based energy procurement from IPPs)
- Acceptance of the principle that Load Management Services (energy storage) may be funded from the bulk energy purchases operating account – a new concept
- Acceptance of the principle to provide re-charging energy at cost and to purchase back at discounted peak energy rates, accounting for round trip losses

Indirect regulation – Municipal tariffs and by-laws (1)

Industry needs re-charge constraint rules – off peak only re-charging

Residential hybrid renewable systems must be on time discriminated tariffs to monetize energy storage system benefits or recover cost of uncontrolled operation – think of R773 of 2008

Firm signals to promote private sector co-investment of (x) amount of energy storage for each (y) amount of self-dispatched renewable energy permitted onto the grid

Indirect regulation – Municipal tariffs and by-laws (2)

We also need to consider, on a non-discriminatory basis -

- Rules and concessions for storage co-located with generation
- Rules and concessions where RE generation linked to energy storage facilities are separately located and can bring additional system benefits to the EDI

Thank you

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