

## NOTES

# Weather Forecasting for Power Generation Seminar SANEDI, 19 Sept 2017

### Why forecasting?

- SA has no electricity market driving forecasting, but it has been shown that Eskom short term load forecasting model (STLF) is showing that the IPP impact on to power system is increasing which necessitates the establishment of a relationship between existing load forecasting methodology and variable resource forecasting methodologies
- Major reasons to proceed with variable resource energy forecasting:
  - a. Variable resource forecasting will become increasingly important as the % of variable produced energy in the mix increases
  - b. Balancing:
    - i. Day ahead power balance estimation
    - ii. Reserve estimation
    - iii. Trade transmission loss and production under a purchase obligation
  - c. Transparency across SOE's:
    - i. SA's unique power and weather system requires bespoke solutions created by the synergy between specific SOE's
    - ii. More efficient and safe to be prepared than surprised
  - d. Skills development and localization
  - e. Cost saving due to increased accuracy of resources

### Best practices

- Imperative to do forecasting on TSO/Utility level as well to verify and to complement incoming forecasts from IPP's that would also provide a good overall picture to the system operator
- A South African Research and Development team is essential to achieve the goal of a local variable resource energy forecasting model. This will require working together with service provider / academia / weather service to continuously improve model accuracy
- Australian modified ANEMOS System worth investigating for SA – specifically the provision for the development of a SA 'ground up' forecasting model which will at some point be accurate enough to be incorporated into the portfolio of procured power predictions
- Use portfolio of models to negate outlier power predictions and improve the forecast accuracy
- Good communication, understanding between weather and power generation forecasters, meteorology and wind power forecasting technology
- Don't fix run schedules several days in advance, but adjust the schedules as the forecasts evolves and gets more and more accurate. Forecasts can be incorporated into maintenance schedule development

- The use of satellite imagery is becoming more attractive especially in Solar short term energy forecasting

### **SA Forecasting R&D nexus**

- New profession of Energy Meteorologists requires international expertise to be transferred locally to develop our own Energy Meteorologists in SA
- Development of utility level Variable Resource Energy Forecasting model for the System Operator will require significant amount of funding and all avenues for support should be explored. Once funding is sourced then the relevant stakeholders can be brought in to transfer knowledge and develop the model whilst intrinsically developing capacity in South Africa.
- The CSIR Energy Centre has as one of its Energy Supply research focus areas of interest “Supply Forecasting (short term, spatially) and being involved with solar and wind forecasting (week-ahead, day-ahead, intra-day), new profession of Energy Meteorologists; long-term forecasting together with NRE
- The CSIR Energy Centre is actively pursuing support and building partnerships on Model for Short Term Forecasting of Variable Resource Energy

### **Proposed Next Steps - Questions to be answered at the outset which are specific to SA**

- Stakeholder composition of a research and development team?
  - Funding and support mechanisms to be explored for development of the local variable resource forecasting model?
  - How will climate change affect the variable resource output in the future?
  - Can we use existing local capacity for numerical weather prediction model downscaling as it stands?
  - How does SA quantify what uncertainty levels are acceptable for the forecasts as it relates to our somewhat isolated power system?
  - What type of forecast do we need?
    - a. Individual generator forecasts
    - b. National Electricity Market (NEM) Wide forecast
    - c. Region forecasts
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