

AIP Plexos Market Simulation Model Validation Project

Workshop 1 – Proposed Model Review Process

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Project aims and timeframe

- This project has two fundamental aims
 - to establish a validated PLEXOS model of the SEM that is ready to accurately predict prices (i.e. SMP with unconstrained schedule quantities by unit)
 - to achieve the consensus agreement and confidence of market participants in the validated model
- The project is to be delivered by KEMA to the AIP by end March 2007
(subject to extent of any identified model workarounds to be developed and implemented)

Coordination with Loop 3 modelling

- An AIP modelling note issued on 8 December indicated that Loop 3 modelling, including data review, would take place this quarter.
- It has been agreed that KEMA's data review will form the core of the Loop 3 data review activity (KEMA is not examining T assumptions)
- The validated data set will be used as part of Loop 3 modelling
- It is envisaged that following data validation, Loop 3 modelling scenarios will be separately discussed and agreed by the Regulatory Authorities with participants end March
- Subsequent Loop 3 modelling will take place with outputs to be produced by June 2007.
- **KEMA's work will not validate any Loop 3 forecast**

Project activities #1

- There are 5 required component activities within this project
 - i. Validation of model algorithms** against T&SC and other relevant associated documents for unconstrained (SMP) model run
 - ii. In conducting (i), identification, development and implementation of any required model workarounds** internal (preferably) or external to PLEXOS to ensure a “compliant” simulation model of the SEM – *where a major issue arises implementation may be beyond March*
 - iii. Validation of modelling assumptions** such as operating regime of interconnectors (e.g. Moyle) and pumped storage; and modelling of forced outages

(Continued over)

Project activities #2

(continued from previous slide)

- iii. Validation of model input data** – primarily validation of generator technical data but also reviewing reasonableness of other input data such as demand and wind data,
- iv. Participant inclusion** – this is a key thread running throughout the project to ensure best outcome for the above. KEMA will actively seek to engage with all market participants including the TSOs but will also consider views and comments from other interested parties. The primary focus of engagement will be regarding model data and assumptions but KEMA will also welcome comments on model algorithms

Activities not covered by this Project

- We will not be cross-validating Plexos against the ABB model - as the model is still being developed for the TSOs
- We will not be reviewing or seeking to change the draft T&SC – we will take the latest available release as the baseline for model validation
- We will not be validating transmission data and assumptions – our review only relates to the unconstrained PLEXOS model of the SEM
- We will not be addressing capacity payments and their calculation in any way
- **This Project will not represent a validation of any SEM market forecast**

Proposed overall project approach

- Overall approach is to be inclusive - this will include workshops and bilateral meetings; as well as written questionnaire/ data requests
- KEMA will be conducting its own independent review of data based on its own international expertise to compare with participant submissions
- Timescales are short thus KEMA's model and data review is intensive and participants will only have relatively short timeframes to provide feedback and responses to requests; and to hold meetings with KEMA
- Objective is to be inclusive but participation will be subject to rigid timelines and deadlines – default position will be KEMA takes a view on the information it has available
- KEMA will report on level of cooperation to the RAs

Proposed project approach – validation of model algorithms #1

- KEMA will undertake a number of activities to validate model algorithms. These are:
 - i. Marginal cost calculation review
 - ii. Short term constraints review
 - iii. Special cases review
 - iv. Shadow price calculation review
 - v. Uplift calculation review
 - vi. Materiality assessment

Project approach – validation of model algorithms #2

- **Commercial Offers: Marginal Costs**
 - Review ability to replicate Commercial Offer structure per TS&C
 - Validate derivation of generator marginal costs by constructing Excel-based calculation tools and comparing to PLEXOS results
- **Technical Offers: Short Term Constraints**
 - Review ability to replicate Technical Offer structure per TS&C
 - Validate constraints handling via a series of unit tests to ensure specific constraints are not breached when intended to be binding
 - Constraints include: availability, minimum stable generation, minimum output, ramp rates, minimum on/off times

Project approach – validation of model algorithms #3

- **Special Cases**

- Review modelling assumptions & handling for specific generation types: wind, hydro, pumped storage, Moyle interconnector, CHP
- Design appropriate unit tests to compare PLEXOS with TS&C terms

- **Shadow Price Calculation**

- Not proposing a “first principles” verification given the review timeframe
- Will sense check PLEXOS shadow prices using a simplified “stack model”
- For constraints ignored in the simplified model, unit tests will be run in PLEXOS to validate the impact of these constraints on shadow prices

Project approach – validation of model algorithms #4

- **Uplift Calculation**

- Design a series of unit tests varying start-up and no-load costs to produce different market schedules, and then analyse the corresponding Uplift changes to ensure that these were consistent with those expected.

- **Materiality Assessment**

- Maintain an issues log for review with Drayton Analytics
- Assess the impact of each unresolved modelling issue upon SMP
- Identify any candidates for further model development

Proposed project approach – validation of modelling assumptions

- KEMA will identify key modelling assumption parameters (for SMP model run) e.g. operation of Moyle Interconnector, pumped storage
- KEMA will seek participant views on current modelling assumptions for these parameters
- KEMA will also review from the perspective of expert modellers and in the context of international comparable modelled behaviour
- On the basis of its own review and taking into account participant views KEMA will determine its view of appropriate assumptions for the key modelling parameters

Proposed project approach – validation of model input data

- Primary focus is on generator data but will also review reasonableness of forecast information such as demand and wind factor data with the TSOs
- Generators will be asked to review and update where necessary their existing submitted generator data - explaining any changes but also reasons for data which does not change
- KEMA will review data against historic performance, as appropriate and its international database on generator performance
- Any issues will be addressed bilaterally with participants but KEMA will ultimately express its view on data validity

Proposed project approach – participant inclusion

- “Process” Workshop – aim is to seek feedback on proposed approach to model and data validation – 1 week for formal response
- Bilateral meetings – these will take place primarily as part of data validation review as required/requested
- Interim Findings Workshop – aim to present interim findings from ongoing model and data validation work – 1 week for formal feedback
- Bilateral meetings – a further round as requested/required
- Final Workshop - aim will be to present final conclusions
- Anticipate release of final model and data validation reports

Proposed project timetable

- w/c 15 Jan – Process Workshop (today)
- w/c 22 Jan – formal feedback on process due 24 Jan
- w/c 29 Jan – issue questionnaires on data and modelling assumptions
- w/c 5 Feb/12 Feb – conduct bilateral meetings as requested/required
- w/c 19 Feb – formal submissions on data (& assumptions) due 16 Feb
- w/c 26 Feb – Initial Findings Workshop
- w/c 26 Feb/5 Mar – conduct bilateral meetings as requested
- w/c 12 Mar – deadline for feedback on initial findings (16 Mar)
- w/c 26 Mar – Final Conclusions Workshop and release of Reports
- **(KEMA model and data review already underway)**

Next steps

- Work has already commenced on model validation; work on assumptions and data validation also underway
- Participants have until Wednesday 24 January to provide formal feedback on proposed project approach
- KEMA will refine project approach based on relevant feedback – aim is to ensure most effective and efficient participant inclusion – outcome will be communicated to all
- Next stage will be to issue model data/assumptions questionnaires and arrange bilateral meetings as required/requested
- Welcome indications at this stage from market participants interested in bilateral meetings

Any questions or comments?

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