

PLEXOS Market Simulation Data and Model Validation Project

A Note to Interested Parties

2nd December 2009

1. Introduction and Background

The Commission for Energy Regulation and the Northern Ireland Authority for Utility Regulation (the Regulatory Authorities) have developed a single all-island electricity market, the Single Electricity Market (SEM), which came into operation on November 1st 2007. Further details on the project can be found on the AIP website (www.allislandproject.org).

Energy Exemplar's PLEXOS for Power Systems was chosen as the electricity market model to carry out modelling work during the all island project. The purpose of this modelling work was primarily to assist all industry participants in developing a greater understanding of the new electricity market arrangements and to provide quantitative support in assessing the potential impacts of the arrangements both on the industry and on the final customer.

The PLEXOS modelling software was also used by the RAs to simulate and forecast the operation of the market in order to implement Directed Contracts (DCs) as part of its market power mitigation strategy for the first three years of the market, and for other regulatory pricing workstreams, such as the required input into the 2008, 2009 and 2010 Capacity Payment Mechanism. The RAs intend to continue to use the PLEXOS model for the forthcoming Directed Contract year (1st October 2010 to 30th September 2011), and through to the end of 2011.

2. The First, Second & Third PLEXOS Validation Projects

In January 2007 the Regulatory Authorities engaged consultants KEMA to independently validate both the PLEXOS model against the SEM Trading and Settlement Code and the input data in the model. The purpose of this exercise was to provide the RAs and the industry with a model that could accurately predict electricity prices in the SEM. The validation project was carried out with the input of market participants and was completed in April 2007. The validation reports, validated dataset and the PLEXOS input database from

the first validation project are published on the AIP website and can be found at the link below.

<http://www.allislandproject.org/en/modelling%20group-info-documents.aspx?article=bc74bdcb-e61d-4d2e-b95d-390d50e06504>

In January 2008 the RAs engaged NERA Economic Consulting to undertake the re-validation of the simulation model's input data and settings to cover the period from the 1st October 2008 to end of 2009. This exercise included a calibration of PLEXOS against the first few months' price outcomes in the SEM. The validation report and the PLEXOS input database from the second validation project are published on the AIP website and can be found at the link below.

http://www.allislandproject.org/en/market_decision_documents.aspx?page=2&article=130d38a3-f5fe-4947-816c-c36a4dd67088

In February 2009 the RAs engaged consultants KEMA to undertake the re-validation of the simulation model's input data and settings to cover the period from the 1st October 2009 to end of 2010. This exercise included a calibration of PLEXOS against the price outcomes in the SEM for April 2008 to March 2009. The validation report and the PLEXOS input database from the third validation project are published on the AIP website and can be found at the link below.

http://www.allislandproject.org/en/market_decision_documents.aspx?article=f31fe1f6-3219-4e1e-a658-57515fc0ce8c

3. The Fourth PLEXOS Validation Project

As part of the RAs' annual model requirements for the fourth tariff year of the SEM, beginning on 1st October 2010, the simulation model's input data needs to be re-validated to reflect developments since the previous exercise, not least the price outcomes in the SEM for the last 20 months or more. The RAs have engaged Redpoint Energy to undertake this project. The project should be completed around mid to late February and will comprise two main elements:

- **Validation of the PLEXOS model input data for 2010 and 2011**

Among other things, this will include updating generator technical characteristics, demand data, wind forecasts, generation outage data, variable operation and maintenance costs etc.

Redpoint will be in contact with the relevant market participants over the course of the next few weeks to update the input database. As the involvement of participants was key to the successful completion of the previous three validation projects, the RAs would ask all generator participants, the Market Operator and System Operators to engage effectively and in a timely manner on all information requests from Redpoint.

- **Calibration of PLEXOS against actual half hourly *ex post* data on unit schedules, shadow prices, uplift and SMPs for the period from 1st November 2007.**

The RAs intend to publish the validated input Access database, any accompanying Excel spreadsheets and a validation report upon completion of the project. Any confidential information submitted by participants to Redpoint should be marked as such and will not be published. The findings of the project will be presented at a workshop which will take place in late February to early March, details of which will follow in due course.

4. Queries and Information

For any queries on the above or further information on this matter please contact Kevin Hagan (khagan@cer.ie) or James Curtin (jcurtin@cer.ie) in the CER.