**Smart Agent Platts IP contributions**

1. **Introduction**

This document describes the IP contributions that Platts has made, is busy making and has committed to make to the Platts-Blocklab Distributed Energy Grid project with respect to the Smart AI Agent (“Agent”). The purpose of the agent is to facilitate effective trading decisions decisions on behalf of users such that the users need not manually buy or sell energy within the microgrid while still benefitting efficiently from participation in the grid.

1. **Completed contributions**

This section details work completed as of date of writing (13/06/2019). This IP is sufficient to implement a working agent. These contributions are as follows:

**2.1 Agent Design**

* Modular agent design

**2.2 Analysis**

* Household usage data analysis
* Household production data analysis
* Cyclical weather data analysis
* Model performance analysis

**2.3 Data Processing**

* Data cleaning module
* Data preprocessing module

**2.4 Predictive Modelling**

* Production model design
* Production model training
* Production model evaluation
* Usage model design
* Usage model training
* Usage model evaluation

**2.5 Trading Module**

* Linear trading module
* Trading module characteristic variants

1. **In-Progress contributions**

As of above date, this section contains contributions that are in the process of being completed and are either in need of finishing or of testing.

**3.1 Deployment Architecture**

* Model storage solution
* Model calling solution
* Model-market communications integration

**3.2 Predictive Module**

* Continual retraining production modelling
* Continual retraining usage modelling

**3.3 Trading Module**

* Q-table reinforcement learning module
* Proximal Q-table reinforcement learning module

1. **Forthcoming contributions**

This section lists the currently-planned contributions expected to be produced over the course of the year.

**4.1 Analysis**

* Model performance evaluator

**4.2** **Predictive Module**

* Online learning system via eligibility traces

**4.3** **Trading Module**

* General function-approximator temporal difference trader module
* Trader-inspired AI-managed trader algorithm