



الشركة العمانية لشراء الطاقة والمياه (س.م.ع.م)  
OMAN POWER AND WATER PROCUREMENT CO. (SAOC)

إحدى شركات مجموعة نماء  
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# Oman Electricity Market Guide

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**Disclaimer:**

This Oman Electricity Market guide (the **Market Guide**) is intended to provide an overview of the Market Rules and does not form part of it, nor does it create any rights or obligations that relate to the Market Rules. This Market Guide shall not substitute for the detailed provisions of the Market Rules.

This Guide should be read in conjunction with the Market Rules and any person that is a Party or seeks to become a Party to the Market Rules must refer to the Market Rules and the Sector Law to understand their obligations and provisions.

Capitalised terms used in the Market Guide carry the same meaning as set in the Market Rules.

Where there are any discrepancies between the Market Guide and the Market Rules, the provisions of the Market Rules shall prevail.

This Market Guide is prepared based on version 0.01 of the Market Rules.

**Timing Conventions:**

The Market Rules uses the following main timing conventions (Section I.5 of Market Rules Document):

- **Trading Period:** means a period of 30 minutes commencing on the hour or half-hour.
- **Trading Day:** means a period of 24 hours commencing at [00:00] on any day.
- **Time Zone:** Gulf Standard Time (GST) which is UTC + 4:00
- **Gate Closure:** means for any Trading Day d is at [10:00] on the day prior to the Trading Day.
- **Ex-Ante:** means the period after Gate Closure but before the start of the Trading Day.
- **Ex-Post:** means the period after the end of the Trading Day.

## Section 1: Introduction

### 1.1 Background

The electricity sector in Oman is governed by the law for the Regulation and Privatisation of the Electricity and Related Water Sector (the **Sector Law**). The Sector Law was promulgated by Royal Decree 78/2004 and amended by Royal Decrees 59/2009 and 47/2013. The Sector Law establishes the duties and responsibilities of the entities involved in the market.

As per the Sector Law, the Oman Power and Water Procurement Company (**OPWP**) is the single buyer of power and water in Oman. OPWP ensures that the need for power and water in Oman is satisfied, at all times, at an economic basis. Power is purchased by OPWP from the Generators and then sold in bulk to the distribution companies, which are responsible for supplying the electricity to the end consumers. Energy in the Main Interconnected System is transmitted from the Generators to the distribution companies through a transmission system that is owned and operated by the Oman Electricity Transmission Company (the **Transmission Company**). The Transmission Company is also responsible for the economic dispatch of the system.

The electricity and related water sector (the **Sector**) is regulated by the Authority for Electricity Regulation (the **Authority**), which ensures compliance of all entities in the Sector with the Sector Law and the relevant government policies. The Authority is also responsible for preserving the rights of all entities under the Sector Law, while securing a fair and transparent competition for new projects. The Authority issues a Licence or an Exemption for any entity seeking to perform any of the regulated activities under the Sector. The regulated activities include the desalination of water, the generation, transmission, distribution, supply, and dispatch of electricity, in addition to certain functions for which OPWP is licensed.

Before the introduction of the spot market, the procurement of electricity by OPWP had been done through Power (and Water) Purchase Agreements (the **P(W)PA**) that are valid for a contracted period of 15 years for an IPP and 20 years for an IWP. Since the early plants got closer to the end of their terms, the question as what to do with them was raised. A study conducted by NERA concluded that the optimal way to move forward entails having a revised tendering process in addition to introducing the spot market. Under the spot market, expiring plants are able to submit cost reflective offers for energy on a daily basis, and they are all paid the same price (System Marginal Price). The benefits of introducing the spot market include increasing the residual value of the plants after their contracts expire and ensuring that plants with higher efficiency are prioritised in dispatch.

Generators holding P(W)PA's when the market operations are initiated are also required to submit offers into the market. However, they are settled and invoiced as per P(W)PAs. In order to enforce participation in the spot market, the Authority will modify the Licences (or Exemptions) of the Parties under the Market Rules to include terms that require agreeing to the Market Rules Document and the associated Procedures and Approved Methodologies. The Market Rules provide details that regulate all parts of the spot market including the obligations on all entities involved in the spot market.

## 1.2 Purpose and Structure

The purpose of this Market Guide is to provide an overview of the Oman Electricity Market (OEM), which is the forthcoming wholesale spot market for power.

The Market Rules is enforced through a multilateral contract (Framework Agreement) that consists of the Market Rules Document, the Market Rules Procedures (**MRPs**) and the Approved Methodologies.

The MRPs are documents that provide administrative information in relation to certain processes that are required for the operation of the wholesale spot market. As for the Approved Methodologies, they also provide information in relation to certain processes required for the operation of the spot market and which require the approval of the Authority.

The Original Parties to the Market Rules have signed a Framework Agreement and subsequent Parties become a Party to the Market Rules by executing an Accession Agreement to the Framework Agreement with OPWP.

All power generators in the Main Interconnected System of Oman, which are licensed to generate and supply electricity (**Generators**), are required to become a Party to the Market Rules and the arrangements therein (the **Pool**). Accordingly, this spot market is for the generation side only and does not cover the purchase of electricity by customers or distribution companies, which will still happen via OPWP, the single buyer under the Sector Law.

The Parties to the Market Rules are:

- the Generators;
- OPWP in its capacity as Power Procurer;
- OPWP in its capacity as Market Operator; and
- Oman Electricity Transmission Company

The Authority is not a Party to the Market Rules but is assigned certain functions under the Market Rules as prescribed under the Sector Law.

The market structure is illustrated in figure 1 below.

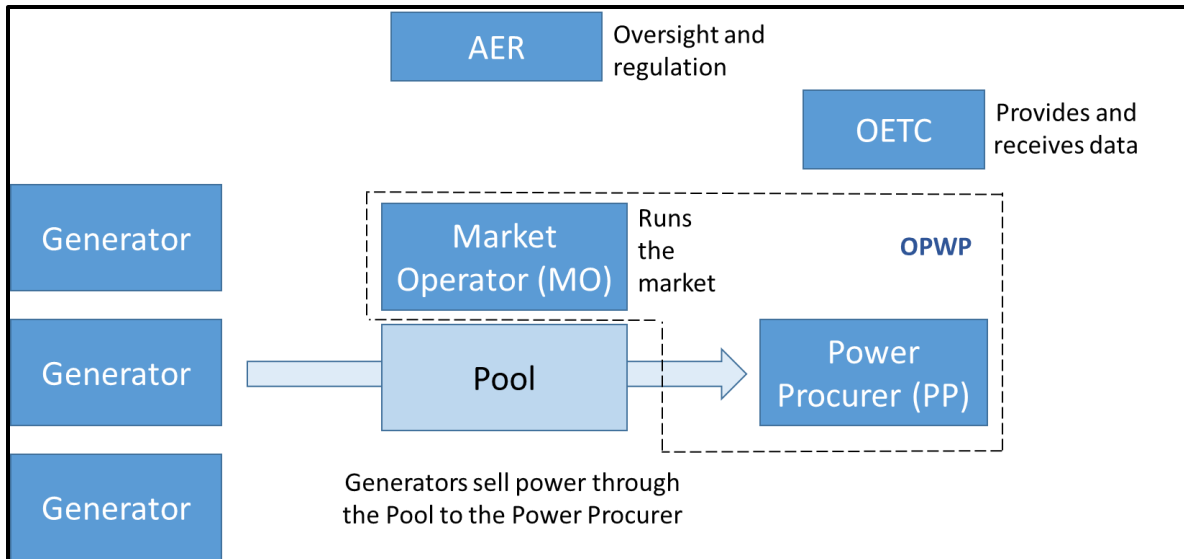


Figure 1: Oman Electricity Market Structure

### 1.3 The Market Rules

The Market Rules sets out the rules and procedures to trade under the market, as well as the processes and requirements to register and participate as a Party to the Market Rules.

The contents of the Market Rules Document are as follows:

- **Section A:** Introduction

This section provides an introduction to the Market Rules, summarising the legal and regulatory background and setting out a description of the Pool, its objectives and the functions of the Parties.

- **Section B:** Glossary and Rules of Interpretation

This section contains a glossary of defined terms used in the Market Rules and provides the meaning for terms, subscripts and variables used in the Market Rules and other rules governing the interpretation of the Market Rules.

- **Section C:** Role of Market Operator and Pool Governance

This section sets out the role of the Market Operator and, where applicable, the Market Advisory Committee in respect of the governance of the Market Rules and the operation of the Pool. It also establishes the capacity and liability of the Market Operator under the Market Rules.

- **Section D:** Parties and Participation

This section sets out the roles of Pool Participants, other Parties to the Market Rules and the role of the Authority. It also sets out the entry process for Generators and includes, as annexes, the form of Accession Agreement and application form for accession to the Framework Agreement.

- **Section E:** Classification and Registration of Pool Units

This section sets out a description of units eligible for Participation in the Pool and how they are classified and further establishes the criteria which must be met for such Participation, as well as procedures that must be followed when ending Participation in the Pool. It also includes, as an annex, illustrations of applications of Pool Unit definitions.

- **Section F: Metering**

This section sets out the Pool Metering Requirements, the requirements for Data Aggregation Rules, Meter Data submission requirements and the requirement to determine Metered Quantities.

- **Section G: Rule Governance and Modification Process**

This section sets out the rules and procedures relating to the modification of the Market Rules and includes, as an annex, a Modification Proposal Form.

- **Section H: Data and Communications**

This section sets out rules for exchanging data between Parties, rules for publication of data by the Market Operator and rules relating to the communication and IT systems used under the Market Rules. It also includes, as annexes, Data Records required in connection with Settlement and Data required to be published on the Market Website.

- **Section I: Pool specifications**

This section sets out trading prohibitions, the Pool Boundary, the arrangements in respect of the Pool Price Cap and Pool Price Floor, Pool timings and processes, and the arrangements for testing. It also includes, as an annex, a timeline for activities undertaken in the Market Rules in respect of Pool operations for a given Trading Day.

- **Section J: Offer Data Submission, Structure and Requirements**

This section sets out rules relating to Offer Data submission responsibilities and processes, and includes, as an annex, the various components of Offer Data.

- **Section K: Pool Quantities and Processes**

This section sets out rules relating to Pool Quantities, the Market Schedule Starting Point, the processing of Offer Data and the calculation of an Aggregate Pool Price.

- **Section L: Energy Pricing and Credits**

This section sets out the Market Scheduling process, the calculation of Market Schedule credits, the calculation of Dispatch Adjustment Credits and Debits, the calculation of the Fuel Cost Debits and the resulting Total Energy Credit for each Production Unit and each Production Block.

- **Section M: Scarcity Pricing and Credits**

This section sets out rules relating to Scarcity Pricing inputs, the calculation of Ex-Ante Scarcity Prices, the calculation of Ex-Post Scarcity Prices, the Scarcity Credit inputs and the calculation of Scarcity Credits.

- **Section N: Settlement Statements**



This section sets out rules relating to the preparation and issuance of Settlement Statements, Settlement Statement calculations and Settlement Statement Data requirements.

- **Section O: Invoicing and Payment of Pool Charges**

This section sets out invoicing requirements and payment obligations and includes, as an annex, the Pool Invoice Format.

- **Section P: Dispute Resolution**

This section sets out the procedures to resolve Disputes arising under the Market Rules and includes, as annexes, the form of various notices relating to the Dispute resolution procedures.

- **Section Q: Miscellaneous**

This section sets out various provisions relating to limitation of liability, confidentiality, Corrupt Practices, intellectual property rights, events of default, suspension and termination (amongst others) and additionally sets out representations and warranties given by the Parties. This section also includes, as annexes, the forms of various notices relating to default, suspension and termination.

## Section 2: Parties and Legal Architecture

### 2.1 Introduction

This section outlines the roles and obligations of the Parties to the Market Rules.

The role of the Market Operator is predominantly set out in Section C of the Market Rules, whereas the roles of the other Parties are mostly set out in Section D of the Market Rules.

- **Market Operator**

The Market Operator is a part of OPWP responsible for implementing and securing the implementation of the Market Rules and the Pool operations under its Licence conditions<sup>1</sup>. It is not a Pool Participant. The powers, functions, duties, responsibilities and liabilities of the Market Operator are set out in Section C of the Market Rules Document.

- **Power Procurer**

The Power Procurer is a Pool Participant responsible for submitting Offer Data in respect of Demand Side Units. It is also responsible for payment to the Generators as per the terms of the Market Rules. Furthermore, it is responsible for determining the Certified Availability of Pool Units in line with the Availability Certification Methodology and responsible as well to prepare Offer Derivation from Contract Terms Principles and get it approved by the Authority.

- **Transmission Company**

The Transmission Company is not a Pool Participant. It is responsible for providing data and information to the Market Operator in relation to Settlement, such as water production, reserve and dispatch, as well as validating certain data and information provided by the Pool Participants to the Market Operator.

- **Generators**

The Generators are responsible for submitting Offers to the Market Operator and receive Pool Charges from the Power Procurer where the power is sold under the Market Rules. For avoidant of doubt, the Autogenerators fall under the category of Generators.

### 2.2 Legal Architecture

The Market Rules is enforced through a multilateral contract signed between the Parties, and the Parties are required to sign the contract as mandated by the Authority in the Licence (or Exemption) conditions of the Parties.

The contract is implemented by way of executing a Framework Agreement between the initial parties to the Market Rules, which are referred to as the Original Parties.

New Parties can only join by executing an Accession Agreement, as explained below in Section 3.

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<sup>1</sup> Note: Licence changes for the OEM are currently still under development.

Whilst the Market Rules are enforced by a contract, the participation and compliance therein is additionally mandated by the Licence (or Exemption) conditions of the Parties, which is enforceable by the Authority.

Any decisions rendered by the Authority in relation to the Market Rules are issued in accordance with the Authority’s regulatory authority under the Sector Law and are therefore binding in nature.

The legal architecture of the market is shown in figure 2 below.

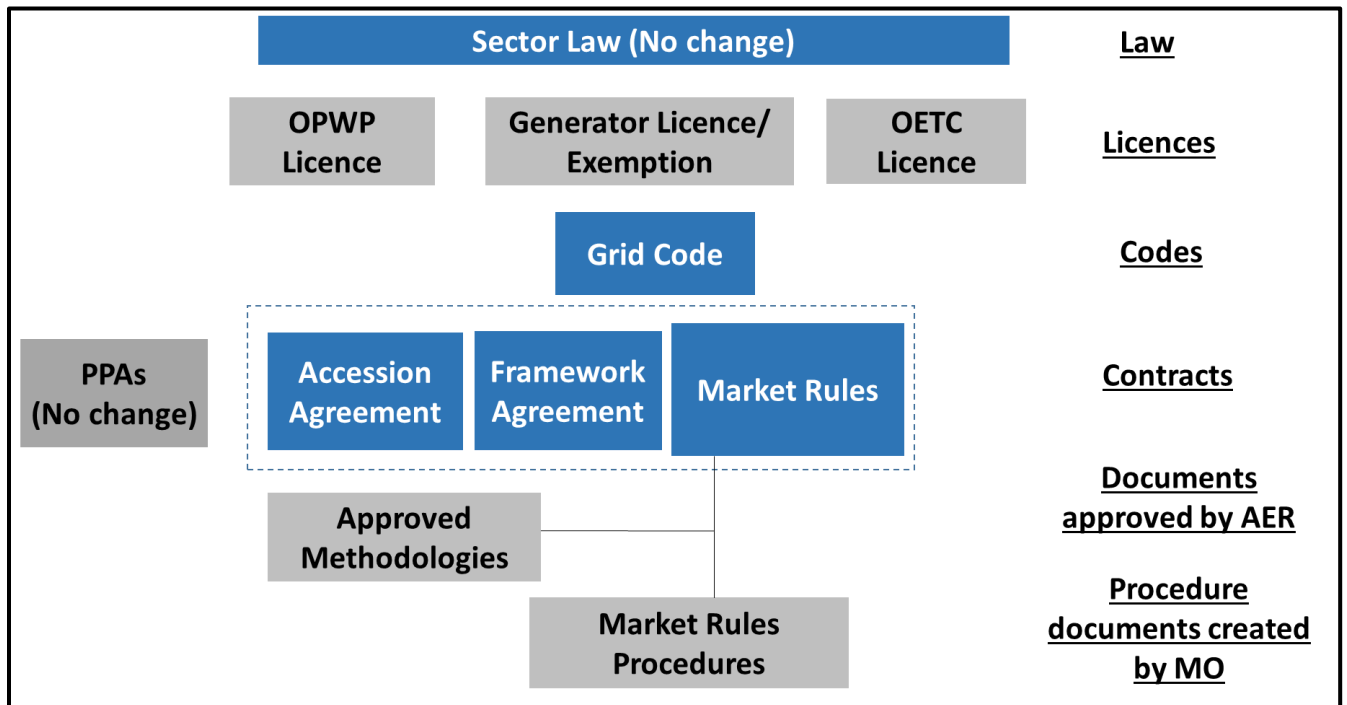


Figure 2: Market Legal Architecture

### 2.3 Market Rules Modifications

The Market Rules specify a process in Section G for modifications to be proposed by Parties, Prospective Parties or the Authority, which then must be developed and assessed by both the Market Operator and the Market Advisory Committee.

The final report is then submitted to the Authority. All modifications require the Authority’s approval.

There is more information on the Modifications process in Section 7 of this guide.

### 2.4 Market Disputes

The Market Rules provide a process in Section P for resolving Disputes. Disputes involving Settlements have a dedicated process in order to deal with Settlement Errors.

As for other disputes or Settlement Disputes that could not be resolved in accordance with the dedicated process, these can be resolved by way of Expert Determination and/or Arbitration.

There is more information on the dispute resolution process in Section 7 of this guide.

## **Section 3: Accession and Registration**

### **3.1 Introduction**

This section outlines the accession and registration process for new Parties. OPWP, the Transmission Company and the Generators that originally executed the Framework Agreement are considered the Original Parties.

If another person would like to join as a Party to the Market Rules, such person can only join in the capacity of a Generator and does so by signing the Accession Agreement.

### **3.2 Entry Process for New Generators**

To join the Market Rules, the applicant must undertake the following:

- a) Satisfy the following conditions:
  - i. Be registered as a company in Oman;
  - ii. Intend to generate electricity in a Production Facility that is connected or intends to be connected to the Main Interconnected System;
  - iii. Be able to show reasonable prospects of obtaining a Generator Licence (or Exemption) from the Authority; and
  - iv. Provide the information required in the application form as set out in Annex D-2 of the Market Rules.
- b) Submit an application to the Market Operator;
- c) Pay the application fee as determined by the Market Operator; and
- d) Accede to the Framework Agreement by executing the Accession Agreement.

### **3.3 Registration**

In order to participate in the Pool, the Generator must first become a Party to the Market Rules in line with 3.2 above. Once that is done, the Generator must become a Participant by Registering its Production Facility/Facilities in accordance with Section E.4 of the Market Rules.

To Register a Production Facility, the Generator must submit a Registration application form containing information in accordance with MRP-E. As part of the Registration process, the Generator must have a valid Connection Agreement and be in compliance with the Grid Code, and where applicable, the Distribution Code.

Once the Registration application form is submitted, the Market Operator will validate it and enter the details of the Production Facility in the Market Register. The Production Facility shall then be able to Participate in the Pool. The main units of participation are as explained below.

### 3.4 Units of Participation

The Market Rules use the following main units of participation:

- **GenSet (Generating Set):** Has the meaning given to it in the Grid Code, which is “any plant which produces electricity (including a (single) GenSet and its associated prime mover, within a CCGT Module).”
- **Production Unit:** Consists of one or several GenSets that are operationally interdependent (e.g. a gas turbine coupled with a steam turbine).
- **Pool Scheduling Unit:** Main unit of participation and can be either a Production Unit, in the case of generation assets, or Transitional Pool Scheduling Unit or a Demand Side Unit.
- **Production Block:** Collection of GenSets that are capable of operational interdependence.
- **Production Facility:** An installation or installations comprising a single facility used for Generation.
- **Pool Unit:** is a Production Facility or (a Production Block or a Production Unit) comprised in a Production Facility, or a Demand Side Unit.

The relationship between the different terms used above is illustrated in figure 3 below.

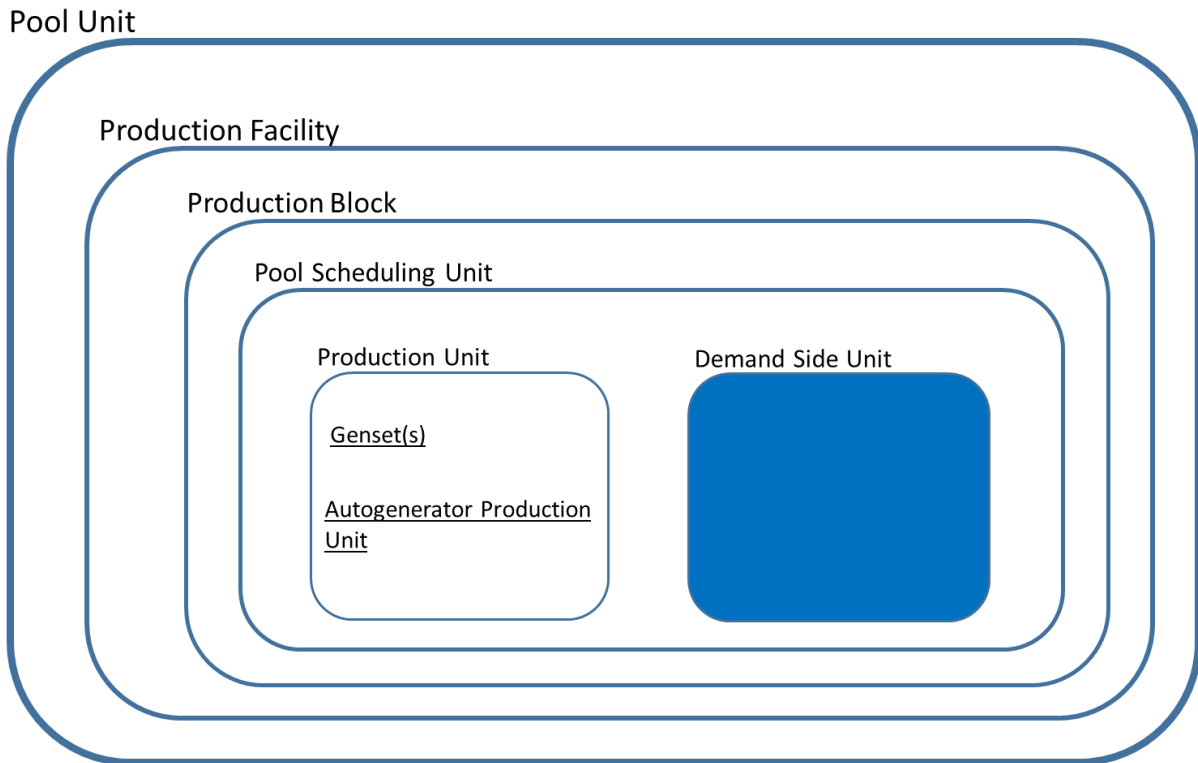


Figure 3: Units of Participation

## Section 4: Market Overview

### 4.1 Introduction

The Pool is the daily wholesale spot market where Generators sell electricity to OPWP in its capacity as Power Procurer under the Market Rules. All power traded in the Pool is sold to the Power Procurer as OPWP is the single buyer of electricity in the Sector as per the Sector Law. The Pool applies to the Main Interconnected System (MIS)<sup>2</sup>.

This section provides a high-level overview of the key features of the Pool, which are:

- Mandatory Pool And Types of Generation;
- Ex-Ante Pool Operation, Centralised Dispatch and Ex-Post Pool Operation;
- Complex bidding;
- System Marginal Price (SMP); and
- Scarcity payments for capacity.

### 4.2 Mandatory Pool and Types of Generation

The underlying design of the Pool is a mandatory gross pool, meaning that all substantial generation should participate, and will offer all of its output into, and be settled through, the Pool.

The mandatory gross pool arrangement is summarised in the Figure 4 below:

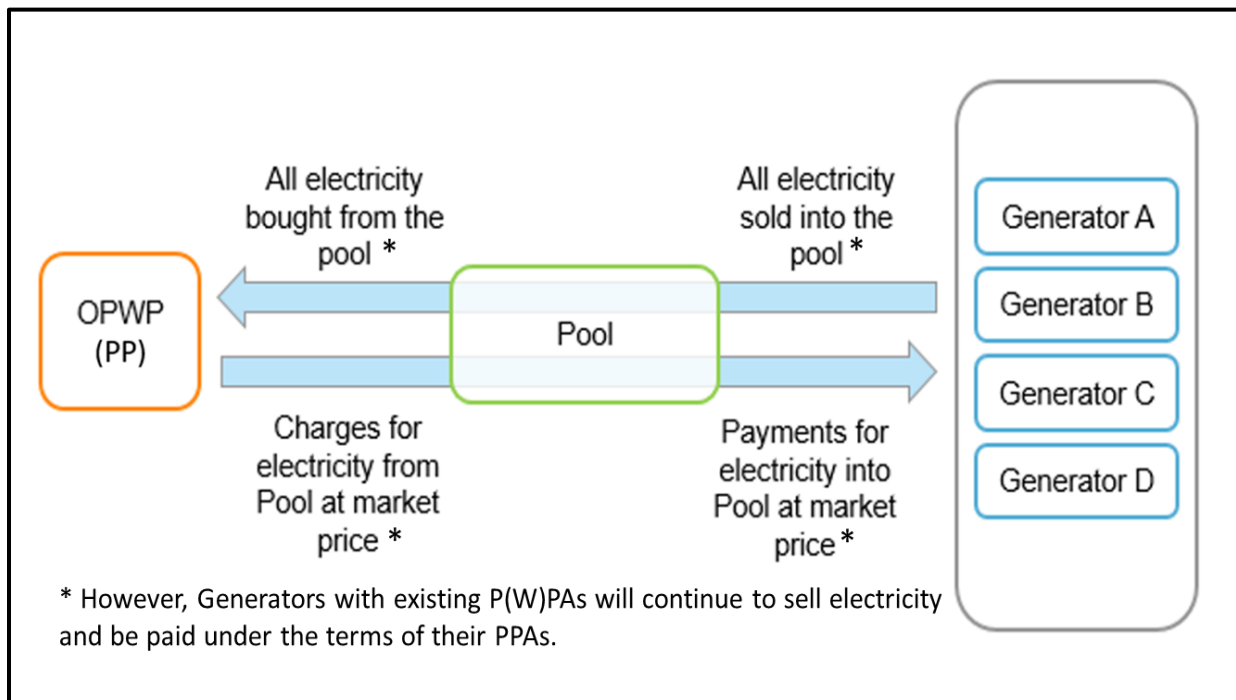


Figure 4: Mandatory gross Pool arrangement

<sup>2</sup> The interconnected power system in the northern part of Oman – see the Market Rules for a more precise definition.

In practice it is expected that there will be some exceptions to the gross nature of the Pool. The existing P(W)PAs between Generators and OPWP will remain in force until the expiry of their terms. Generators with current P(W)PAs will be obliged to participate in the Pool by submitting Offer Data into the Pool but will continue to receive payments based on the terms of their respective P(W)PAs, rather than based on Pool Prices. In the Market Rules, these P(W)PAs are referred to as Non-Pool-Based Power Contracts.

There will also be exceptions to the mandatory nature of the Pool. Participation in the Pool is enforced by AER through conditions in Licences/Exemptions.

Generation in the MIS will be either:

- explicitly included in the Pool; or
- not included in the Pool and instead treated as an adjustment to the Pool Demand. Such Generators will not become Pool Participants, offer into the Pool or receive payments from the Pool.

This is illustrated in figure 5 below.

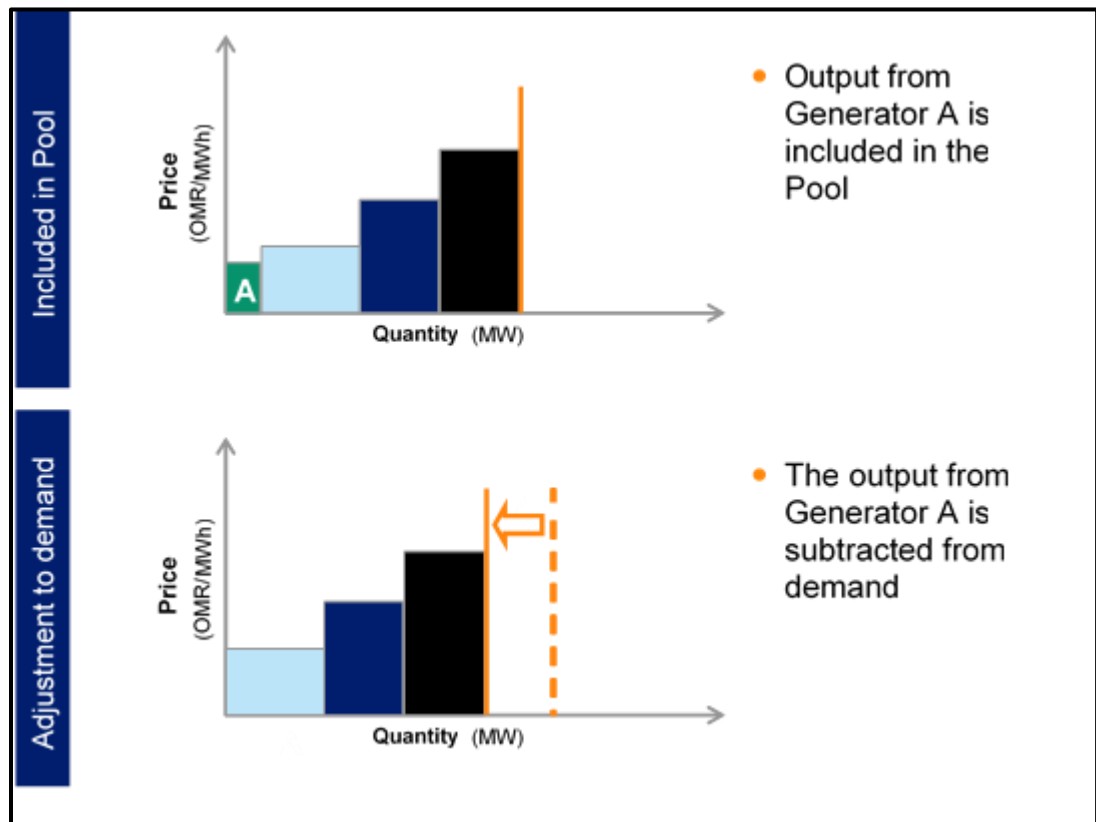


Figure 5: Treatment of Generators' Output

The inclusion of the Production Units in the Pool is the default arrangement unless the following criteria is fulfilled, in which case the Pool Units will be instead treated as a net demand adjustment.



The criteria for net adjustment treatment, which is for Pool-Excluded Generation, is as follows:

- The scale of the activity is small (less than 1 MW), meaning that it is not practical or appropriate to seek to include it within the Pool;
- The Capacity of the Production Facility is less than 5 MW but not less than 1 MW, and the Generator chooses not to participate in the Pool.
- The installation for Generation is not connected to the Main Interconnected System or not located in Oman.

For generation that is included in the Pool, any participating unit in the Pool is either a Price Maker unit or a Price Taker unit. However, there is also a possibility of having a Hybrid unit in the Pool. Below are the descriptions of each classification of participating units.

**Price Maker:** These are units that are fully dispatchable and the dispatcher has the ability to Dispatch those unit from its minimum stable generation to its full rated output. All participating units are Price Makers unless they are Price Takers.

**Price Taker:** These are units that are not fully dispatchable and their output is driven by an exogenous factor that may include:

- co-generation for water production, in the case of Multi Stage Flash (MSF) desalination;
- meteorological conditions in the case of intermittent renewable energy source (RES) such as wind and solar Generation;
- units under transitional status due to switching from one configuration to another; and
- units undergoing a test.

However, it is also possible to have some units that are partially dispatchable and partially not dispatchable, which is called a **Hybrid unit**. The mechanisms to differentiate any output from such unit in the Market rules is with a Must Run Flag. The Must Run Flag is intended to create a distinction between: (i) the part of Output linked to a Must Run in which the Must Run Flag will be set to one; and (ii) the part of Output to meet electricity demand in the Grid and is not linked to a must run condition in which the Must Run Flag will be set to zero.

Table 1 below shows the mapping for the classifications of units discussed above.

Table 1: Production Units Mapping

Size	Dispatchable?	Price Maker	Price Taker	Net Demand Adjustment
5 MW and above	Yes	✓	-	-
	Part	Non-must run element if Hybrid Price Taker	Must run element for Hybrid Price Taker	-
	No	-	✓	-
Between 1 MW and 5 MW	Yes	✓ If chooses to participate & approved by the Authority	-	✓ If chooses not to participate
	No	-	✓ If choose to participate	✓ If choose not to participate
1 MW and less	N/A			✓

Figure 6 below shows how different Production Units will be treated under the Pool:

1	Treatment in Pool	Gross		Net
	2	Price setting ability	Price Maker	Price Taker
3				
All	cap < 1MW			✓
'Standard' generation	1MW ≤ cap < 5MW	✓ (if central dispatch)	✓ (if not central dispatch)	✓
	cap ≥ 5MW	✓		
Part must-run	All	Hybrid linked to forced must-run context		
Auto-generators	1MW ≤ cap < 5MW	Net export = PT or PM, net import = -demand		✓
	cap ≥ 5MW	Net export = PT or PM, net import = -demand		
Intermittent RES	1MW ≤ cap < 5MW	✓ (if central dispatch)	✓ (if not central dispatch)	✓
	cap ≥ 5MW	✓ (if central dispatch)	✓ (if not central dispatch)	
Inter-connections	International			✓
	Domestic			✓

Figure 6: Mapping for different Production Unit activities

### 4.3 Ex-Ante Pool Operation, Centralised Dispatch and Ex-Post Pool Operation

The Oman Electricity Market Operates on a daily cycle, the Trading Day which runs from midnight to midnight, and which is divided into 30 minute Trading Periods.

- Some market activities occur before the start of the Trading Day (“Ex-Ante”)
- On the Trading Day itself dispatch is carried out by the Transmission Company, but there is no intra-day trading.
- After the Trading Day (“Ex-Post”) there are some further market activities relating to that day.

Participants are required to submit their Offer Data the day before the Trading Day (“D-1”) in respect of each of their Pool Scheduling Units. A demand forecast is provided by the Transmission Company, then adjusted by the Market Operator to reflect the netted out generation and imports or exports across interconnectors.

The Market Operator uses the the offers, demand forecast and other input data to calculate the Ex-Ante Market Schedule, which includes generation schedules for each Pool Scheduling Unit, and to calculate the Ex-Ante System Marginal Price for each Trading Period.

The Ex-Ante Market Schedule is driven based on the unit’s cost of production and the technical capabilities of the Units. The Ex-Ante Market Schedule assumes an unconstrained system without taking into account any constraints on the transmission system i.e. it represents an idealised generation schedule.

The Market Operator sends the offer data to the Transmission Company at midday on D-1, in time for the data to be used in the Transmission Company generation scheduling process.

On the Trading Day, Dispatchable Production Units are dispatched centrally by the Transmission Company. Self-dispatch of these units by the Generator is not allowed. The Grid Code specifies the dispatch arrangement where the Transmission Company determines the dispatch values and issues instructions directly to Generators. The Market Rules do not contain any requirements for the Transmission Company scheduling and dispatch process, except that the dispatch instructions should be recorded for use in the Ex-Post market.

The Market Schedules assume an unconstrained system regardless of the transmission constraint. However, the Transmission Company dispatches the Units taking into consideration the transmission system constraints and system security. Therefore the actual dispatch instructions given to the Generators might deviate from the Market Schedule Quantities produced by the Market Operator.

On the day after the Trading Day D, the Market Operator produces an Ex-Post Market Schedule (the “Indicative Market Schedule”) and SMPs based on the Actual Dispatched Quantities. 5 Business Days after the Trading Day, the Market Operator produces an updated Ex-Post Market Schedule (the “Confirmed Market Schedule”) and SMPs, which takes into account any updated data – e.g. corrected meter data.

Settlement occurs in a monthly cycle, following the end of each month.

More details about operation of the OEM can be found in Section 6.

#### 4.4 Complex Bids

Participants are required to submit their Offer Data the day before the Trading Day (i.e. Trading Day -1) in respect of each of their Pool Scheduling Units. The Offer Data consists of Structural Offer Data, Commercial Offer Data, and Technical Offer Data, as detailed below.

- Structural Offer Data: contains details of Production Facilities set-up and underlying Pool Scheduling Units. Table 2 below lists the elements in this part of the data.
- Technical Offer Data: relates to the technical capabilities of the Production Unit and consists of parameters such as ramp rates, minimum on/off times, minimum stable generation and other parameters. Table 3 below shows the required elements to be included in the Technical Offer Data.
- Commercial Offer Data: consists of the elements shown in Table 4.

*Table 2: The Standard Structural Offer Data*

Structural Offer Data	
1	the Production Blocks in respect of each Production Facility
2	the Pool Scheduling Units in respect of each Production Block
3	the Configurations in respect of each Production Block
4	the Transition Library in respect of each Production Block

5	the Transition Matrix in respect of each Production Block
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- **Configurations**

The GenSets within a Production Block can be configured in multiple ways. For example, a Production Block with two gas turbines and one steam turbine can be run as a CCGT, as two independent gas turbines or as a single train coupled gas turbine-steam turbine plus a standalone gas turbine.

The Pool accommodates the variety of configurations in which a plant can operate. Feasible combinations of Production units (or Configurations) within a Production Block are recognised within the Market Rules and Offer Data is submitted for each combination on a mutually exclusive basis. The market scheduling software can then select the optimum configurations of plant in the creation of the Market Schedule. This allows the Market Schedule to reflect the technical flexibility available within the Production Block.

*Table 3: The Standard Technical Offer Data*

<b>Technical Offer Data</b>	
1	Fuel Type to apply uniformly to all Trading Periods h in Trading Day d
2	One Minimum Output to apply uniformly to all Trading Periods h in Trading Day d
3	One Ramp Up Rate to apply uniformly to all Trading Periods h in Trading Day d
4	One Ramp Down Rate to apply uniformly to all Trading Periods h in Trading Day d
5	One Maximum On Time to apply uniformly to all Trading Periods h in Trading Day d
6	One Minimum On Time to apply uniformly to all Trading Periods h in Trading Day d
7	One Minimum Off Time to apply uniformly to all Trading Periods h in Trading Day d.

*Table 4: The Standard Commercial Offer Data*

<b>Commercial Offer Data</b>	
1	Offer Curve(s) consisting of up to ten Price-Quantity Pairs
2	No Load Cost (Fuel Economic)
3	No Load Cost (Non Fuel)
4	Nominated Quantity for each Trading Period h (for Price Taker)
5	Offered Availability for each Trading Period h

6	Transition Cost (Fuel Economic)
7	Transition Cost (Non Fuel)
8	Actual Fuel Price
9	Must Run Auxiliary Consumption

The following describes some of the main elements of the Commercial Offer listed in Table 4:

- **Offer Curve(s):** Participants offer Price-Quantity Pairs representing their Offer Curve of Offered Availability and related incremental price of production. A minimum of 1 and a maximum of 10 Price Quantity Pairs, each of which sets out a Quantity up to and equal to which the associated Price applies. Price Quantity Pairs must be strictly monotonically increasing with only one Price for each Quantity representing the incremental cost which is the total cost associated with generating one additional MWh of electricity. Price-Quantity Pairs are bounded, in terms of Price, by the Market Price Floor and the Market Price Cap which are values set by the Authority.
- **No Load Cost:** reflects the total Operating Cost of a Production Unit, which is invariant with the quantity of Output and is incurred at all times when the Production Unit has an Output greater than its minimum stable generation.
- **Transition Costs:** the costs associated with change from active group of Pool Scheduling Units to another group of Pool Scheduling units, for example the cost associated with starting-up the Pool Scheduling Unit.

One important feature of the offers is that they should be made on the basis of an Economic Fuel Price, rather than the Actual Fuel Price the Generator pays under its fuel supply agreement. The Economic Fuel Price is determined by the Market Operator in accordance with the Economic Fuel Price Calculation Methodology and published. Making offers based on the Economic Fuel Price means that the Pool Prices will also reflect the Economic Fuel Price, rather than the fuel contract prices. Section 5.2.4 explains briefly how this is handled in the settlement calculations.

**Data elements required to be submitted by different types of Pool Scheduling Units:**

- Price Maker Production Units submit Price-Quantity Pairs, No-Load Costs and Transition Costs of the nature outlined above only;
- Price Taker Production Units submit Nominated Quantities, which outline the intended output of the Production Unit in question during a Trading Period, and they do not submit an Offer Curve since their offer price is set to zero;
- Production Facilities with a Hybrid Production Unit must submit a Must Run Auxiliary Consumption in addition to the other Data Elements;
- Autogenerators submit all data except for the No Load Cost; and
- Demand Side Units, which are Price Maker Production Units, do not submit a No Load Cost.

#### **4.5 System Marginal Price (SMP)**

The system prices are determined by matching offers from Generators to the Pool Demand in each Trading Period. Thus all Generators settled in the OEM will be settled based on one common half-hourly market price regardless of their locational demand and constraints. This is termed a single price zone, in contrast to some other electricity markets that have different prices at different locations

The Market Operator calculates the SMP in each Trading Period to reflect the cost of the marginal MWh required to meet Pool Demand in a Trading Period within the context of an unconstrained schedule. The Market Operator will use a component of the market systems called the Market Scheduling Software (MSS) to calculate Market Schedules and SMP. SMP is bounded by a Price Cap and a Price Floor.

SMP forms the basis of Energy Charges paid to Generators in settlement – see Section 5.2 for additional details.

#### **4.6 Scarcity Payments for Capacity**

SMP is set in the Pool based on marginal pricing principles, and Generators are obliged to limit their Offers to represent the actual short run marginal cost. Therefore, a separate capacity mechanism is designed to reflect the value of capacity at times of scarcity. Scarcity Payments are made on the basis of Availability for Certified Units and Metered Quantity for non-Certified Units. The mechanism is intended to provide the highest Scarcity Charges to available Units at periods with tightest margin between available capacity and the required capacity, in order to value the supply of capacity appropriately and incentivise Availability.

The Scarcity Price provides a spot value for capacity in each Trading Period expressed in OMR/MWh. The Scarcity Price is derived based on:

- a Reliability Price, derived from parameters to be specified by Authority;
- annual caps on total scarcity payments, to be specified by Authority (and monthly caps which are set in accordance with an Approved Methodology over which the Authority has oversight); and
- the Scarcity Factor in the Trading Period, calculated based on an Approved Scarcity Factor Table Methodology over which the Authority has oversight.

Additional details of the calculation of Scarcity Credits can be found in Section 5.3.

## Section 5: Pricing and Settlement

### 5.1 Introduction

This section provides a high-level overview of the following aspects of the Market Rules:

- Energy Charges;
- Scarcity Credits; and
- Settlement and Invoicing.

### 5.2 Energy Charges

This section provides a summary of the approach in the Market Rules to calculate Energy Charges by/to the Pool Participants.

Conceptually the Energy Charges take account of three quantities for each PSU in each Trading Period:

- Market Schedule Quantity (MSQ) – the amount scheduled in the market by the Market Scheduling Software.
- Dispatch Quantity (DQ) – the amount dispatched in real-time by the Transmission Company, which may differ from the MSQ as the Transmission Company issues Dispatch Instructions to ensure the reliable operation of the power system. There are adjustments to Energy Charges based on the differences between MSQ and DQ.
- Metered Quantity (MQ) – derived from meter data, which may differ from DQ, depending on how closely the Generator followed its Dispatch Instructions. There are further adjustments to Energy Charges based on the differences between DQ and MQ, referred to as the Uninstructed Imbalance.

In addition, there is a further adjustment to reflect that Pool Participants are required to submit their offers based on the Economic Fuel Price (EFP), which can be different than the Actual Fuel Price (AFP) paid by each generator.

From this, the Energy Credits and Debits under the Market Rules for each Production Block in a Trading Day are as listed below and shown in figure 7:

- Market Schedule Daily Energy Credit,
- Market Schedule Make Whole Credit,
- Constrained On Credit,
- Dispatch Adjustment Debit,
- Uninstructed Imbalance Credit,
- Uninstructed Imbalance Debit,
- Fuel Price Adjustment Debit.



	Market Schedule	Dispatch Adjustments		Uninstructed Imbalance	Fuel Adjustment
Energy	Market Schedule Energy Credit (MSEDC)	Dispatch Adjustment Debit (DAD)	Constrained On Credit (CONONC)	Uninstructed Imbalance Daily Credit/ Debit (UNINSTIMBDC/UNINSTIMBDD)	Fuel Price Adjustment Debit (FPAD)
Make Whole	Market Schedule Make Whole Credit (MSMWC)				

Figure 7: Energy Debits and Credits

The Daily Energy Credit for a Production Facility (PFDEC) is calculated as:

$$PFDEC_{fd} = \sum_{b \text{ in } f} \left\{ MSDEC_{bd} + MSMWC_{bd} - DAD_{bd} + CONONC_{bd} \right\} + UNINSTIMBDC_{bd} - UNINSTIMBDD_{bd} - FPAD_{fd}$$

The sections below will describe each of the component used above to calculate the Production Facility Daily Energy Credits.

### 5.2.1 Market Schedule Energy Credits

The Market Schedule Energy Credit is calculated based on the Market Schedule produced by the Market Scheduling Software.

Charge	Description	Market Rules reference
<b>Market Schedule Energy Credits (MSEC)</b>  <b>Market Schedule Daily Energy Credits (MSDEC)</b>	<p>The basic energy charge: quantity multiplied by price in each Trading Period.</p> <ul style="list-style-type: none"> <li>The Market Schedule Energy Credits (MSEC) for each Pool Scheduling Unit (PSU) in each Trading Period will be calculated by multiplying the System Marginal Price (SMP) with the Market Schedule Quantities (MSQ) for that PSU, produced from the applicable Ex-Post Market Schedule Run.</li> <li>These quantities are aggregated to form the Market Schedule Daily Energy Credits (MSDEC) for the Production Block.</li> </ul>	L.3.2

<p><b>Market Schedule Make Whole Credit (MSMWC)</b></p>	<p>The Market Scheduling Software uses the transition costs and no load costs in the Generators’ complex bids, and in some circumstances these costs may not be recovered over the day by the Market Schedule Daily Energy Credits, which are based on the SMP. Where this happens, a Market Schedule Make Whole Credit (MSMWC) is calculated, so that the Production Block covers its offered costs.</p> <ul style="list-style-type: none"> <li>• The Market Schedule Production Cost (MSPC) for each Production Block in each Trading Day is calculated by summing up the Production Cost of all PSU plus the Market Schedule Transition Cost (MSTC) of that Production Block.</li> <li>• The Market Schedule Make Whole Credit (MSMWC), for each Production Block is calculated as the difference between the Market Schedule Production Cost and the Market Schedule Daily Energy Credits of each Production Block.</li> </ul>	<p>L.3.3</p>
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**5.2.2 Dispatch Adjustment Credits and Debits**

The Market Rules anticipate that the actual Dispatch by the Transmission Company will be different than the Market Schedule and accordingly adjustments to the Market Schedule Energy Credits will be applied. The following steps are followed to calculate the adjustments to the Market Schedule Energy Credits:

Charge	Description	Market Rules reference
<p><b>Dispatch Schedule Production Cost (DSPC)</b></p>	<p>Adjustments paid for differences between the Market Schedule Quantities and the Dispatch Quantities are paid based on the cost of dispatch, as specified in the Generator’s offer.</p> <ul style="list-style-type: none"> <li>• The Dispatch Schedule Production Cost (DSPC) of each Production Block in a Trading Day shall be calculated based on the sum of actual Dispatched Quantities multiplied by the offered prices from the Offer Curves for each Trading Period in a Trading Day, for each PSU, plus the Dispatch Schedule No Load Cost and the Dispatch Schedule Transition Cost.</li> </ul>	<p>L.4.1</p>

<p><b>Dispatch Adjustments Debit (DAD)</b></p>	<p>DAD is applied for each Production Block in the case that the sum of the Market Schedule Quantities are greater than the Dispatch Schedule Quantities – i.e. less generation output was required in real-time dispatch than in the market schedule. The DAD backs out the part of the market schedule energy credits corresponding to the reduction in generation.</p> <p>Note that there is no “constrained off” payment compensating the Generator for having been dispatched down, they simply have their energy credits adjusted to reflect the dispatch quantities.</p> <ul style="list-style-type: none"> <li>• The DAD is calculated based on the difference between the Market Schedule Production Cost and the Dispatch Schedule Production Cost.</li> </ul>	<p>L.4.2</p>
<p><b>Constrained On Credit (CONONC)</b></p>	<p>CONONC is applied for each Production Block in the case that the sum of the Market Schedule Quantities are less than the Dispatch Schedule Quantities – i.e. more generation output was required in real-time dispatch than in the market schedule. The CONONC adds a payment for this additional dispatch.</p> <ul style="list-style-type: none"> <li>• The Constraint On Credit is calculated based on the difference between the Dispatch Schedule Production Cost and Market Schedule Production Cost.</li> </ul>	<p>L.4.3</p>

**5.2.3 Uninstructed Imbalances**

The Uninstructed Imbalance Credits and Debits are made to Energy Credits in respect of each Pool Scheduling Unit when its Metered Quantity differs from its Dispatch Quantity. Each PSU is considered individually – there is no netting out if one unit is up and another down.

The calculations use a number of bands of tolerance (TOLOD and TOLUD for over and under delivery respectively), with different prices applying for different levels of uninstructed imbalance.

Charge	Description	Market Rules reference
<p><b>Uninstructed Imbalances Daily Credit (UNINSTIMBDC)</b></p>	<p>An Uninstructed Imbalance Credit occurs when the PSU Metered Quantity is above the Dispatch Quantity.</p> <ul style="list-style-type: none"> <li>• If within TOLOD, it will receive its offer price</li> <li>• For imbalance greater than TOLOD, an Over Delivery Discount Factor (ODF) is applied to the minimum of its offer price and SMP</li> </ul>	<p>L.5.2, L.5.4</p>

<b>Uninstructed Imbalance Daily Debit (UNINSTIMBDD)</b>	<p>An Uninstructed Imbalance Debit occurs when the PSU Metered Quantity is below the Dispatch Quantity.</p> <ul style="list-style-type: none"> <li>• If within TOLUD, it will receive its offer price</li> <li>• For imbalance greater than TOLUD, an Under Delivery Discount Factor (UDF) is applied to the maximum of its offer price and SMP</li> </ul>	L.5.3, L.5.5
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**5.2.4 Fuel Price Adjustment Debit**

Pool Participants are required to submit their offers based on the Economic Fuel Price (EFP). Therefore, the SMP and all calculations of the Energy Credits and Debits reflect the EFP. In settlement, there is a need to adjust energy payments to reflect the difference between the EFP and the Actual Fuel Price (AFP) paid by each generator.

This is achieved in one of two ways, depending on the availability of fuel consumption data (FCON).

Charge	Description	Market Rules reference
<b>Fuel Price Adjustment Debit (FPAD)</b>	<p>Where FCON can be determined:</p> <ul style="list-style-type: none"> <li>• The adjustment will be the difference between the EFP and AFP, multiplied by FCON.</li> </ul>	L.6.5.2
<b>Fuel Price Adjustment Debit (FPAD)</b>	<p>Where FCON cannot be determined, then the Inferred Fuel Price Adjustment Debit (IFPAD) is used instead:</p> <ul style="list-style-type: none"> <li>• The differences in production cost when using EFP vs AFP, using the offer curves, no load and transition costs for the Meter Quantity, are aggregated for the Production Facility</li> </ul>	L.6.2-L.6.5

**5.3 Scarcity Credits**

This section represents the approach of driving the Scarcity Credits under the Market Rules. The below figure 8 shows the main inputs impacting the Scarcity Credit calculation.

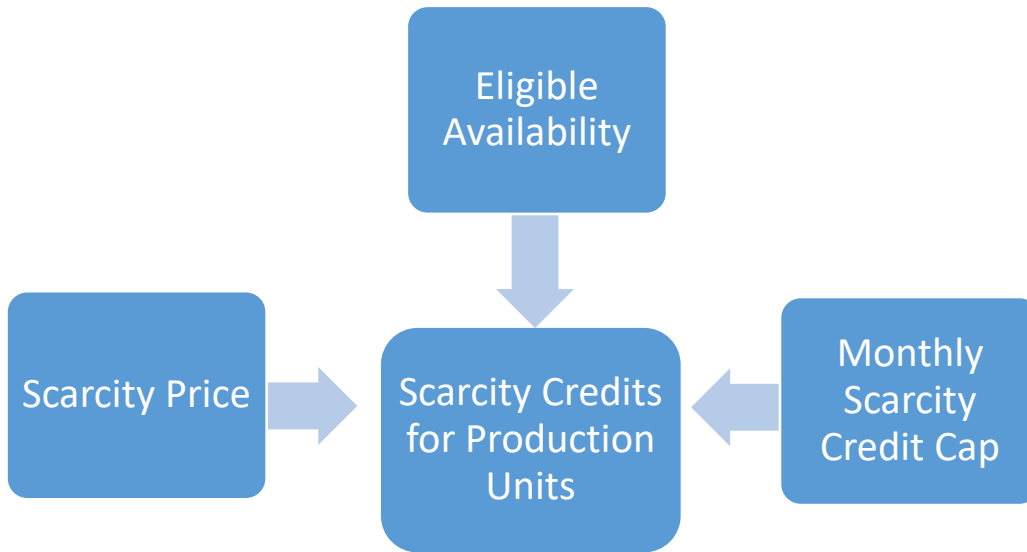


Figure 8: Factors determining Scarcity Credits

### 5.3.1 Scarcity Price (SP)

Scarcity Prices are calculated Ex-Ante and Ex-Post, with the Ex-Post prices used in settlement.

Parameter	Description	Market Rules reference
<b>Scarcity Price (SP)</b>	For each trading period, the SP for a Production Unit is calculated by subtracting the System Marginal Price (SMP) in each Trading Period from the Annual Reliability Price (RP) and multiplying the result with Ex-Post Scarcity Factor (EPSF)	M.3.1, M.4.1
<b>Reliability Price (RP)</b>	<p>The RP is a value calculated by the Authority on an annual basis to represent:</p> <ul style="list-style-type: none"> <li>• the price needed to deliver an incremental MWh from a best new entrant in order to achieve the reliability standard, given costs of new entry and a desired reliability standard,; and</li> </ul> <p>It should be set at a level which is consistent with the corresponding Scarcity Factor Table Methodology and the Annual Scarcity Credit Cap</p>	M.2.1

<b>Ex-post Scarcity Factor (EPSF)</b>	<p>EPSF is calculated from a Scarcity Factor Table corresponding to the value of Input Margin.</p> <ul style="list-style-type: none"> <li>• The Scarcity Factor Table is established by the Market Operator each year based on the Scarcity Factor Table Methodology. It relates an Input Margin to a Derived Scarcity Factor.</li> <li>• The Input Margin is intended to be a representation of the Ex-Post Margin: Ex-Post System Available Capacity minus Ex-Post System Capacity Requirement.</li> <li>• The output, EPSF should be a decimal number between 0 and 1.</li> </ul>	M.2.2, Scarcity Factor Table Methodology
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**5.3.2 Eligible Availability**

Eligible Availability is calculated from Certified Availability, Metered Quantity, and Dispatched Quantity of each Production Unit in each Trading Period.

Parameter	Description	Market Rules reference
<b>Eligible Availability (EA) for generators</b>	<p>The Eligible Availability (EA) for a Production Unit depends on the following:</p> <ul style="list-style-type: none"> <li>• Whether the unit is Certified or not: a unit that is not certified will have EA = MQ</li> <li>• For plant that is certified, the EA relates to the configuration with the largest available capacity. So the Production Units that are members of the Configuration With Largest Aggregate Availability (CWLAA) are utilised in the calculations.</li> <li>• Whether the Production Unit followed the Dispatch Instructions or not also affects the EA.</li> </ul>	M.5.2, M.5.3
<b>Eligible Availability (EA) for demand side</b>	<p>The Eligible Availability (EA) for a Demand Side Unit depends on the whether the unit is Certified or not:</p> <ul style="list-style-type: none"> <li>• A unit that is not certified will have EA= MQ</li> <li>• A unit that is certified will take into account the capacity available.</li> </ul>	M.5.2

### 5.3.3 Monthly Scarcity Credit Cap (MSCC)

Under the Market Rules, the Monthly Scarcity Credit Cap are used to determine whether Credits need to be scaled downwards. Allocating the annual cap across months allows a profile where monthly caps can be higher in months where the system is expected to be facing tighter margins, and also ensures that some scarcity credits continue to be available in later months, to maintain availability incentives in those months. Where payments for a month have been capped, there is an annual process that may make some of the capped amount available for those whose payments were capped during the year (see 5.3.5 below).

Parameter	Description	Market Rules reference
<b>Monthly Scarcity Credit Cap (MSCC)</b>	<p>The MSCC is derived:</p> <ul style="list-style-type: none"> <li>From the Annual Scarcity Credit Cap (ASCC) determined by the Authority</li> <li>The ASCC is then split into monthly caps by the MO based on Monthly Scarcity Credit Cap Methodology</li> </ul>	M.5.4, Monthly Scarcity Credit Cap Methodology

### 5.3.4 Within Year Monthly Scarcity Credits

Parameter	Description	Market Rules reference
<b>Monthly Total Preliminary Scarcity Credit (MTPSC)</b> <b>Preliminary Scarcity Credit (PSC)</b>	<p>A Preliminary Scarcity Credit (PSC) is calculated in respect of each Eligible Availability Quantity (EAQ) in each Trading Period, using the Scarcity Price (SP) and Scarcity Price Coefficient (SPC) (which reflects the Ex-post Scarcity Factor (EPSF))</p> <ul style="list-style-type: none"> <li><math>PSC = SPC \times SP \times EAQ</math></li> <li>Monthly Total Preliminary Scarcity Credit (MTPSC) is the sum of PSC across all Eligible Availability Quantities, Pool Scheduling Units and Trading Periods in the Month</li> </ul>	M.6.1, M.6.2.2
<b>Preliminary Scarcity Scaling Factor (PSSF)</b> <b>Adjusted Scarcity Credit</b> <b>Monthly Adjusted Scarcity Credit</b>	<p>If the Monthly Total Preliminary Scarcity Credit are greater than the monthly cap, then the scarcity credits are scaled back so that the total matches the cap.</p> <p>The result is the Monthly Adjusted Scarcity Credit (MASC)</p>	M.6.2.3, M.6.2.4, M.6.2.5

The Monthly Adjusted Scarcity Credit will appear on the Indicative and Confirmed Monthly Scarcity Settlement Statements, and will be paid in the settlement for that month.

### **5.3.5 End of Year Monthly Scarcity Credits**

By the end of the Year, the Market Operator will calculate and analyze the Scarcity Credits given to the Generators comparing with the Scarcity Credit Monthly Cap set prior to the beginning of the Year. This section summarizes the treatment of overspend or underspend of Scarcity Credits with respect to the Monthly Scarcity Credit Caps. The calculation of the end of year Monthly Scarcity Credit depends on the following:

- **Total Unrealised Scarcity Value (TUSV):** is the summation of monthly money that could have been distributed if Scarcity Credits were higher – i.e. where the scarcity payments for a month did not reach the monthly cap.
- **Total Realised Unpaid Scarcity Value (TRUSV):** is the summation of monthly money that would have been distributed in the absence of the cap – i.e. where payments in a month were reduced by the monthly cap, the amount of reduction.

The purpose of the Scarcity Credit adjustment by the end of the Year is to use some or all of **(TUSV)** to increase the caps in overspend months so that Pool Scheduling Units recover as much of **(TRUSV)** as possible. See Market Rules M.6.3 for the details of the calculations.

The result is the Annual Supplemental Scarcity Credit (ASSC), which is calculated and paid (if applicable) in the settlement cycle for the last month of the year. The value of ASSC for each Pool Participant will depend in the levels of monthly scarcity payments and caps through the year, as well as the availability of the Pool Participant through the year.

## **Settlement and Invoicing**

### **5.3.6 Settlement Statements**

The Market Operator shall prepare the following Settlement Statements in respect of Production Facilities and Demand Side Units:

- In Day+2BD @ 15:00 Hrs:** Issue Indicative Daily Energy Settlement Statements for a Production Facility for a period of one Trading Day;
- In Day+6BD @ 16:00 Hrs:** Issue Confirmed Daily Energy Settlement Statements for a Production Facility for a period of one Trading Day;
- In M+6BD @ 16:00 Hrs:** Monthly Energy Settlement Statements, in respect of Energy Charges aggregated over a period of one Month;
- In M+6BD @ 15:00 Hrs:** Indicative Monthly Scarcity Settlement Statements in respect of Scarcity Charges for a period of one Month; and
- In M+11BD @ 15:00 Hrs:** Confirmed Monthly Scarcity Settlement Statements in respect of Scarcity Charges for a period of one Month and, where applicable, one Year.



The **Production Facility Daily Energy Credit** for a Production Facility is calculated as the sum of the Production Block Total Energy Credit, as described in section 5.2 above, comprised in the Production Facility.

The **Production Facility Monthly Energy Credit** for a Production Facility is calculated as the sum of the Production Facility Daily Energy Credit for the month.

The **Production Facility Monthly Scarcity Credit** for a Production Facility is calculated as the sum of the Monthly Adjusted Scarcity Credit for a Production Unit in a Month.

A Confirmed Settlement Statement is binding on Pool Participants as to the values of the Pool Charges in the Settlement Statement, but a Pool Participant has the right to raise a Settlement Query and to the provisions of the Market Rules for performing Additional Settlement Runs.

### **5.3.7 Invoicing and Payments**

The Market Operator is required under the Market Rules to prepare and issue Pool Invoices to all Pool Participants **in month+11BD** and the Due Date of such invoice is 25 Days from issuing the Invoice. The amount of the Pool Invoice should contain the following:

- a) Production Facility Monthly Energy Credit;
- b) Production Facility Monthly Scarcity Credit; and
- c) Where applicable, Production Facility Annual Supplemental Scarcity Credit.

OPWP, acting as the Power Procurer, will be responsible under the Market Rules for payments to Pool Participants.

See Chapter O of the Market Rules for more details about invoicing and payment.

## Section 6: Market Operation

### 6.1 Introduction

This section outlines a description of the main operational timescales of the Pool from the perspective of a Participant. This focuses on the key operational activities prior to the relevant Trading Day, on the relevant Trading Day and after the relevant Trading Day. At the end of this section a brief summary of the links between the Market and the actual Dispatch by the Transmission Company is provided.

### 6.2 Pre- Day-1 activities

The below table 5 summarises the Pool activities in Pre- Day-1 activities and the responsibilities of the Parties to submit relevant Data.

*Table 5: Pre-Day-1 activities*

Time	Initiating Party	Event
Y-4m <sup>a</sup>	Transmission Company	- Report to the Authority recommending values for Tolerances for Over Delivery and Under Delivery
2BD <sup>b</sup> after AER determination or Y-2m whichever is earlier	Market Operator	<ul style="list-style-type: none"> <li>- Publish the Monthly Scarcity Credit Cap</li> <li>- Publish values for Tolerances for Over Delivery and Under Delivery</li> <li>- Publish values for Over Delivery Discount Factor and Under Delivery Premium Factor</li> <li>- Publish Annual Scarcity Credit Cap,</li> <li>- Publish the Reliability Price</li> </ul>
Y-2m	Market Operator	- Publish the Scarcity Factor Table
2BD after AER determination	Market Operator	- Publish the Pool Price Cap and Pool Price Floor
d-2BD	Pool Participants	- Submit Testing Schedule to Market Operator in case of planned testing

<sup>a</sup> 4 months before the beginning of the year

<sup>b</sup> two Business Days

### 6.3 Day-1 activities

The below table 6 summarises the Pool activities in Day-1 and the responsibilities of the Parties to submit relevant Data.

*Table 6: Day-1 activities*

Time	Initiating Party	Event
09:00	Market Operator	<ul style="list-style-type: none"> <li>- Publish temperature forecast data</li> <li>- Publish Economic Fuel Price information</li> </ul>

09:15	Transmission Company	- Send desalination requirements to the relevant Pool Participants
10:00	Power Procurer	- Send Reserve Holding Thresholds to Market Operator and relevant Pool Participants
< 10:00	Pool Participants	- Submit Offer Data
10:00	Pool Participants	- Gate closure for submission of Offer Data
10:00	Power Procurer	- Send Forecast System Exports to Market Operator
11:00	Transmission Company	- Send inputs for Forecast Pool Demand to Market Operator and - Send Ex-Ante Spinning Reserve Requirements to Market Operator
12:00	Market Operator	- Send Validated Offer Data to Transmission Company - Calculate Ex-Ante Reserve Holding Limits and send to relevant Pool Participants - Calculate Ex-Ante Reserve Holding Quantities and send to relevant Pool Participants - Initiate Ex-Ante Market Schedule Run - Initiate Ex-Ante Scarcity Price Run
13:00	Market Operator	- Publish Ex-Ante Market Schedule - Publish Ex-Ante SMP
14:00	Market Operator	- Publish Ex-Ante Scarcity Price, Scarcity Factor and Margin - Publish Ex-Ante Aggregate Pool Price

#### 6.4 On the Trading Day

The Transmission Company will receive the Generator's offers from the Market Operator, but the Market Rules do not contain any obligations for the Transmission Company (or Generators) in relation to scheduling and dispatch of the power system during the Trading Day. These matters will continue to be dealt with solely in the Grid Code, which sets out the roles and duties of the relevant organisations.

After the Trading Day, information about the actual dispatch on the day is provided to the Market Operator by the Transmission Company and by Pool Participants. The actual Dispatch by the Transmission Company on the day will have an impact to the settlement calculations which form the payments to Pool Participants. As described in section 5 of this Market Guide, there will be Dispatch Adjustment Credits and Debits to the Market Schedule Production Cost. Furthermore, Uninstructed Imbalances will be dealt with separately in the calculation whether as a Debit or as a Credit to the Market Schedule Production Cost.

## 6.5 Day+1 activities

The below table 7 summarises the Pool activities in Day+1 and the responsibilities of the Parties to submit relevant Data.

*Table 7: Day+1 activities*

<b>Time</b>	<b>Initiating Party</b>	<b>Event</b>
10:00	Pool Participants	- Submit Meter Data to Market Operator
12:00	Pool Participants	- Submit revised Offer Data (where permitted) - Submit of Fuel Consumption Data to Market Operator - Submit Actual Availability to Market Operator
12:00	Transmission Company	- Submit Demand Shedding quantity to Market Operator - Submit GenSet Dispatch Quantities to Market Operator - Submit Curtailed Quantity for Price Taker Production Units to Market Operator - Submit GenSet Actual Availability to Market Operator - Submit System Exports to Market Operator - Send Ex-Post Spinning Reserve Requirement to Market Operator
12:00	Market Operator	- Calculate Ex-Post Reserve Holding Limits and send to relevant Pool Participants - Calculate Ex-Post Reserve Holding Quantities and send to relevant Pool Participants
13:00	Market Operator	- Initiate Indicative Market Schedule Run - Initiate Indicative Scarcity Price Run
15:00	Market Operator	- Publish Indicative Market Schedule - Publish Indicative SMP - Publish Indicative Scarcity Price, Scarcity Factor and Margin - Publish Indicative Aggregate Pool Price

## 6.6 Post Day+1 activities

The below table 8 summarises the Pool activities in Post Day+1 and the responsibilities of the Parties to submit relevant Data.

Table 8: Post Day+1 activities

Time	Initiating Party	Event
d+2BD	Market Operator	<ul style="list-style-type: none"> <li>- At 13:00 initiate Indicative Energy Settlement Run</li> <li>- At 15:00 issue Indicative Daily Energy Settlement Statement</li> </ul>
d+5BD	Market Operator	<ul style="list-style-type: none"> <li>- At 13:00 Initiate Confirmed Market Schedule Run</li> <li>- At 15:00 publish Confirmed Market Schedule</li> <li>- At 15:00 publish Confirmed SMP</li> </ul>
d+6BD	Market Operator	<ul style="list-style-type: none"> <li>- At 15:00 initiate Confirmed Energy Settlement Run for Energy Credits</li> <li>- At 16:00 issue Confirmed Daily Energy Settlement Statement</li> </ul>
m+6BD	Market Operator	<ul style="list-style-type: none"> <li>- At 13:00 initiate Indicative Scarcity Settlement Run</li> <li>- At 15:00 issue Indicative Monthly Scarcity Settlement Statements</li> </ul>
m+10BD	Market Operator	<ul style="list-style-type: none"> <li>- At 13:00 initiate Confirmed Monthly Scarcity Price Run</li> <li>- At 15:00 publish Scarcity Prices from Confirmed Monthly Scarcity Price Run, Scarcity Factors and Margins</li> <li>- At 15:00 publish Confirmed Aggregate Pool Prices</li> </ul>
m+11BD	Market Operator	<ul style="list-style-type: none"> <li>- At 13:00 initiate Confirmed Monthly Scarcity Settlement Run</li> <li>- At 15:00 issue Confirmed Monthly Scarcity Settlement Statements</li> <li>- At 15:00 issue Pool Invoice</li> </ul>
y+11BD	Market Operator	<ul style="list-style-type: none"> <li>- At 13:00 initiate Confirmed Monthly Scarcity Settlement Run for final Month of the Year, including year-end reconciliation of Scarcity Credits</li> <li>- At 15:00 issue Confirmed Monthly Scarcity Settlement Statements for final Month of the Year, including year-end reconciliation of Scarcity Credits</li> </ul>

## 6.7 Market Scheduling Software (MSS)

The Market Operator uses software called the MSS to determine Market Schedules and SMP. An overview of the MSS operation is described below.

### 6.7.1 MSS Functions

The MSS Software is used to produce the following:

- SMP for each Trading Period;
- The Market Schedule Quantity (**MSQ**), which is the quantity of Output scheduled by the MSS for each Price Maker Production Unit for each Trading Period; and
- Market Schedule Transitions (**MST**) for each Production Block for each Trading Period.

The objective of the MSS is to minimise the sum of the Production Cost of scheduled Production Blocks Quantities and Transitions over the defined Optimisation Horizon. Based on the Offer Data provided by Market Participants, the MSS seeks to identify the lowest total production cost solution at which Price Maker Generator Units provide sufficient generation to meet Pool Demand that is not met by Price Taker Units and Units under Test.

The MSS calculates the SMP in each Trading Period to reflect the cost of the marginal MWh required to meet Pool Demand in a Trading Period within the context of an unconstrained schedule.

### 6.7.2 MMS Software Operation

There are three MSS runs in respect of each Trading Day; one Ex-Ante run prior to the beginning of the Trading Day and two Ex-Post runs after actual data has been received, after the Trading Day. The Ex-Post runs are the Ex-Post Indicative and the Ex-Post Confirmed. In addition to these runs, Additional Pool Runs can be performed in case of settlement Query or Dispute raised.

In respect of the first run, the Gate Closure is 10:00 AM of each day in which the Participants can submit Offer Data in respect of their Production Unit prior to that time. New Offer Data cannot be submitted for the Ex-Post runs and the most recent Ex-Ante data will be used by default if Offer Data is not submitted by Participants. The following table shows the different types of runs carried out by the Market Operator using the software and the purpose of each run:

*Table 9: Pool Runs*

Run	Time	Output	Purpose
<b>Ex-Ante Pool Run</b>			
Ex-Ante Market Schedule Run	d-1D [12:00] after the Gate Closure time	-Ex-Ante Market Schedule -Ex-Ante Pool Prices	-Informational purposes only -Not used for invoicing or settlement
<b>Ex-Post Pool Runs</b>			
Indicative Pool Runs	d+1D [13:00]	-Indicative Market Schedule -Indicative Pool Prices -Indicative Pool Charges	-Allowing for Settlement Queries to be raised -Not used for invoicing or settlement

		-Indicative Settlement Statements	
Confirmed Pool Runs	D+5D [15:00]	- Confirmed Market Schedule - Confirmed Pool Prices - Confirmed Settlement Statements	- Confirmed Settlement Statements used for Settlement, Trading, Clearing and Invoicing
Additional Pool Runs	after the relevant Confirmed Pool Run has been performed for a Trading Day d and will not be performed 24 months following the Trading Day d	-Revised Market Schedule - Revised Pool Prices - Additional Settlement Statements	- Resolving Query or Settlement Dispute raised by Participants

## **Section 7: Dispute Resolution and Modifications to the Market Rules**

### **7.1 Introduction**

The first part of this section outlines the procedures to notify and resolve Disputes arising under the Market Rules or in association with aspects of it, and the process for modifying the Market Rules once they are in force. Dispute Resolution procedures include resolution by the Dispute Review Procedure, the Dispute Review Committee, Expert determination, and arbitration. The procedure is firstly determined in accordance with the type of the Dispute in question. If the Dispute is not resolved in accordance with the determined procedure, the Dispute is escalated to the next appropriate procedure. This section also clarifies the role and scope of the Dispute Review Committee and the Authority in relation to Disputes.

The second part of this section sets out the process for submitting a proposed rule change to the Market Operator, and the analysis and consultation that the proposal will be subject to before being provided to the Authority for a final decision as to whether the Market Rule modification is accepted.

### **7.2 Dispute Resolution**

#### **7.2.1 Scope**

The rules of Dispute Resolution under the Market Rules do not apply to the Sector Law, any Licence, or any decision of the Authority in accordance with the Sector Law or any Licence.

Further, any disputes that arise under any contract other than the Framework Agreement or Market Rules will be resolved under that Contract and not the Market Rules, with the exception of the following:

- Where the subject matter of the Dispute is the same as the subject matter of a contractual dispute of a Power Contract that is outside the Market Rules and the Disputing Parties are the same parties to the Power Contract; or
- Where the subject matter of the Dispute is in relation to Settlement and is the same as the subject matter of a contract between any of the Disputing Parties and the Transmission Company or the Power Procurer.

In either of the aforementioned exceptions, the Dispute and contractual dispute may be consolidated if any of the Disputing Parties requires it.

Where a dispute is in relation to Settlement and to a Party's compliance with any provision of the Metering & Data Exchange Code of the Grid Code, then the dispute may be raised as a Dispute under the Market Rules.

All disputes in respect of the validity of the contract constituted by the Framework Agreement and/or Market Rules document must be referred to the Omani courts for resolution.



## 7.2.2 Dispute Resolution Process

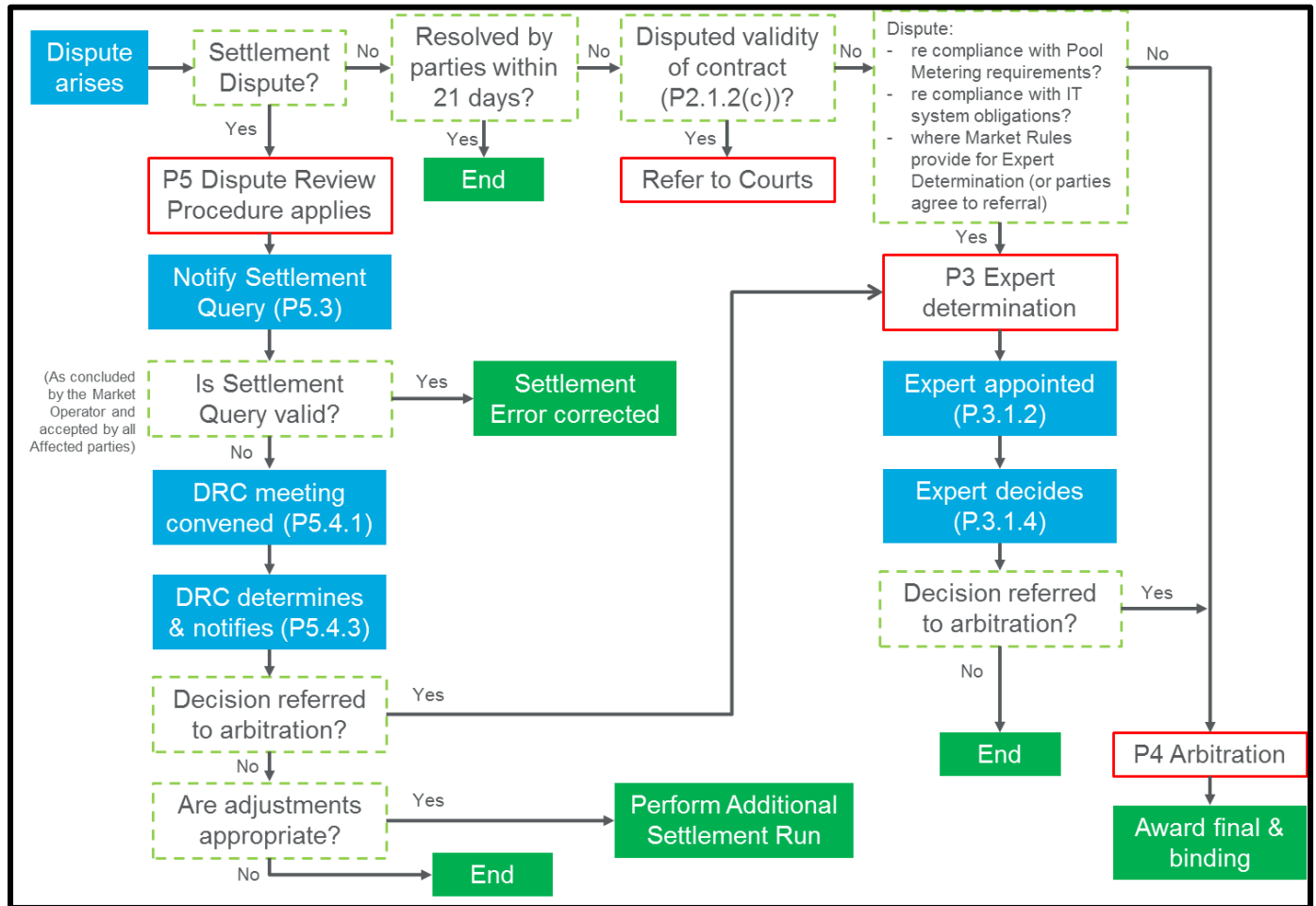


Figure 9: Dispute Resolution Process

When a Dispute arises, it is processed differently depending on whether or not it is a Settlement Dispute. When a Party discovers a Settlement Error, the Dispute Review Procedure shall be followed. The procedure starts by raising a Settlement Query in respect of the Settlement error. If the Settlement Query is not accepted, then the Party may elevate the Query into a Settlement Dispute. The Settlement Dispute is presented to the Dispute Review Committee (DRC) for their recommendation on the Matter. The DRC is a subcommittee of the Market Advisory Committee convened for the purpose of reviewing Settlement Disputes. If an agreement is not reached following the of DRC's determination, the matter may be referred to Expert determination or arbitration.

If the Dispute is not a Settlement Dispute, and the Disputing Parties are not able to resolve the Dispute within 21 Business Days, the Dispute may be referred to Expert determination or arbitration.

### 7.3 Market Rules Modifications

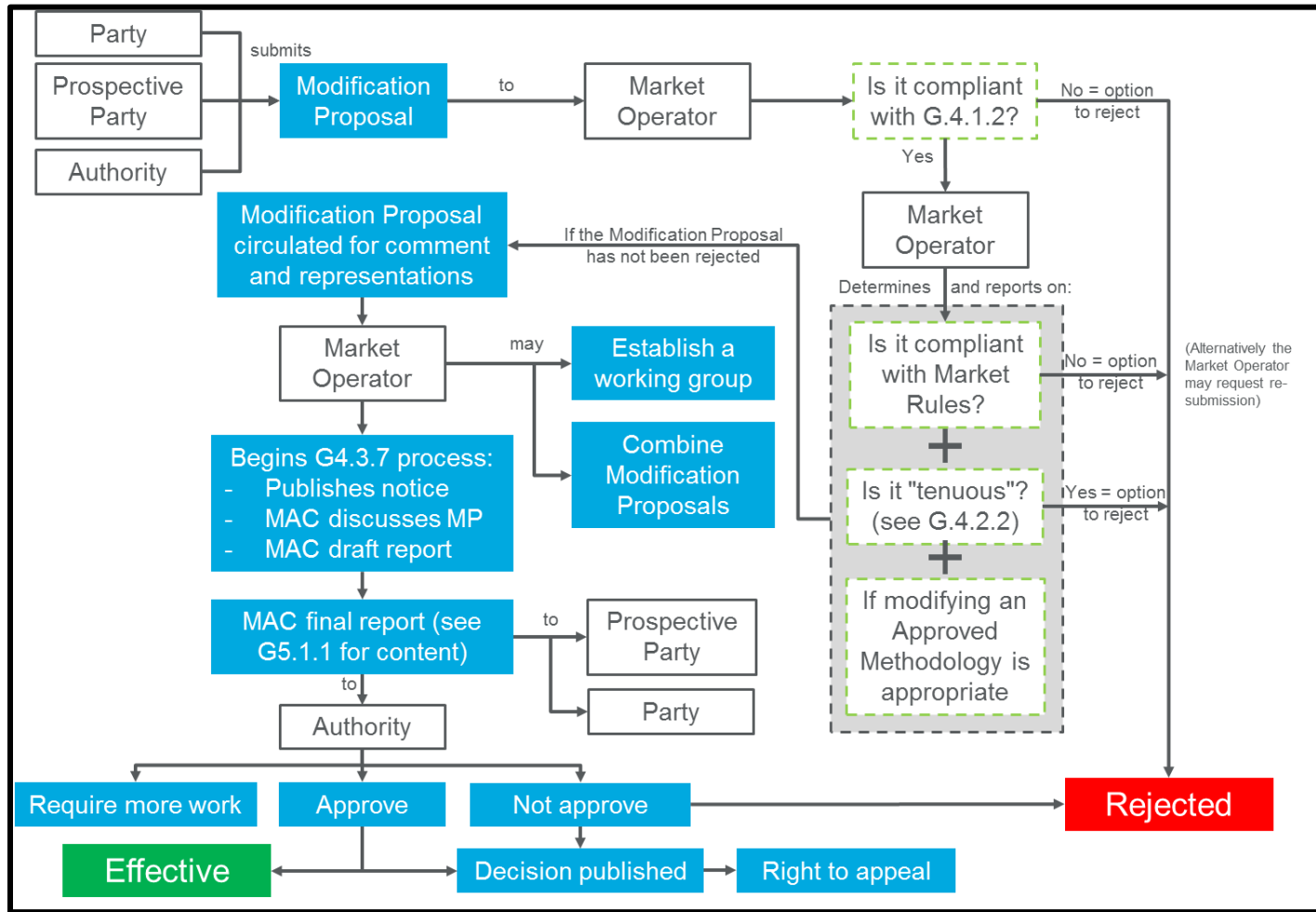


Figure 10: Market Rules Modifications Process

Modification Proposals can be submitted by Parties or the Authority to the MO. Others who may join the market later and meet certain criteria (a Prospective Party) may also submit Modification Proposal to the MO. Upon receipt of a Modification Proposal, the MO initially reviews the proposal for completion. Additionally, the MO shall determine whether the Proposal is compliant with the Market Rules, and whether or not it is tenuous. Accordingly, the MO may reject the proposal at its initial stage. If the proposal is not rejected, it is circulated to the Parties, Prospective Parties, and the Authority for their representations on the proposal. The Market Advisory Committee (MAC) then discusses the proposal at its next meeting and prepares a report in respect of its discussions and representations. After receiving the final report from the MAC, the Authority shall decide on whether to approve, not approve, or additional work is needed in terms of the Modification Proposal, and may also decide the timing of when the Modification will come into force.