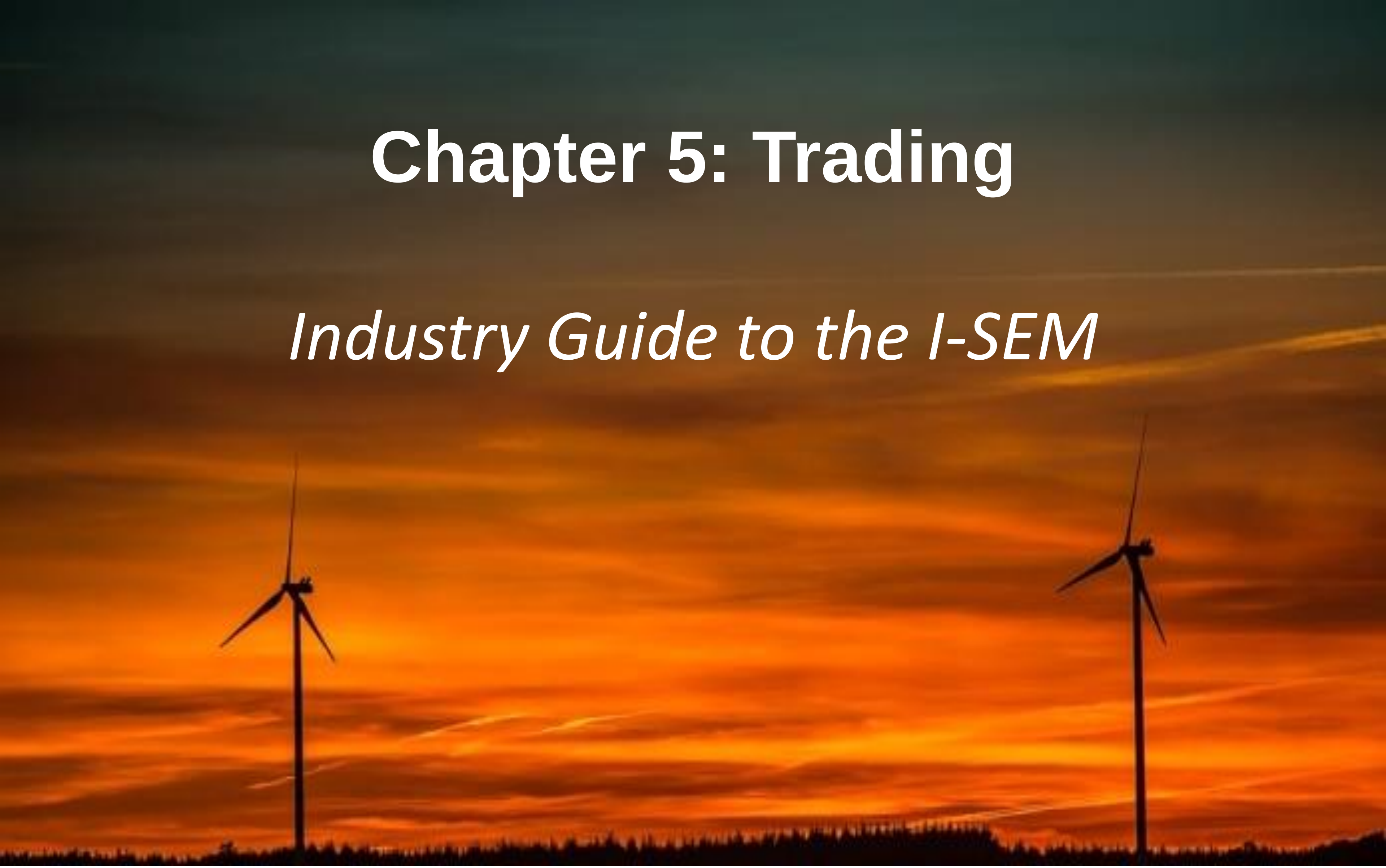
Chapter 5: Trading

Industry Guide to the I-SEM



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5.1 Submission timelines

Each market operates over different timelines, as described in Chapter 4. By way of an example, the combined submission timelines for the physical markets in trading period 17, which starts at 07:00 and ends 07:30, on day D is illustrated in Figure 20. Note that the DAM trading day is divided into 24 (1-hour) trading periods, whereas the IDM trading day is divided into 48 (30-minute) trading periods. The BM is also divided into 30-minute imbalance settlement periods with six (5-minute) imbalance pricing periods in each imbalance settlement period.

Note. The BM imbalance settlement period and IDM trading period are aligned and generally referred to, simply, as the “trading period”.

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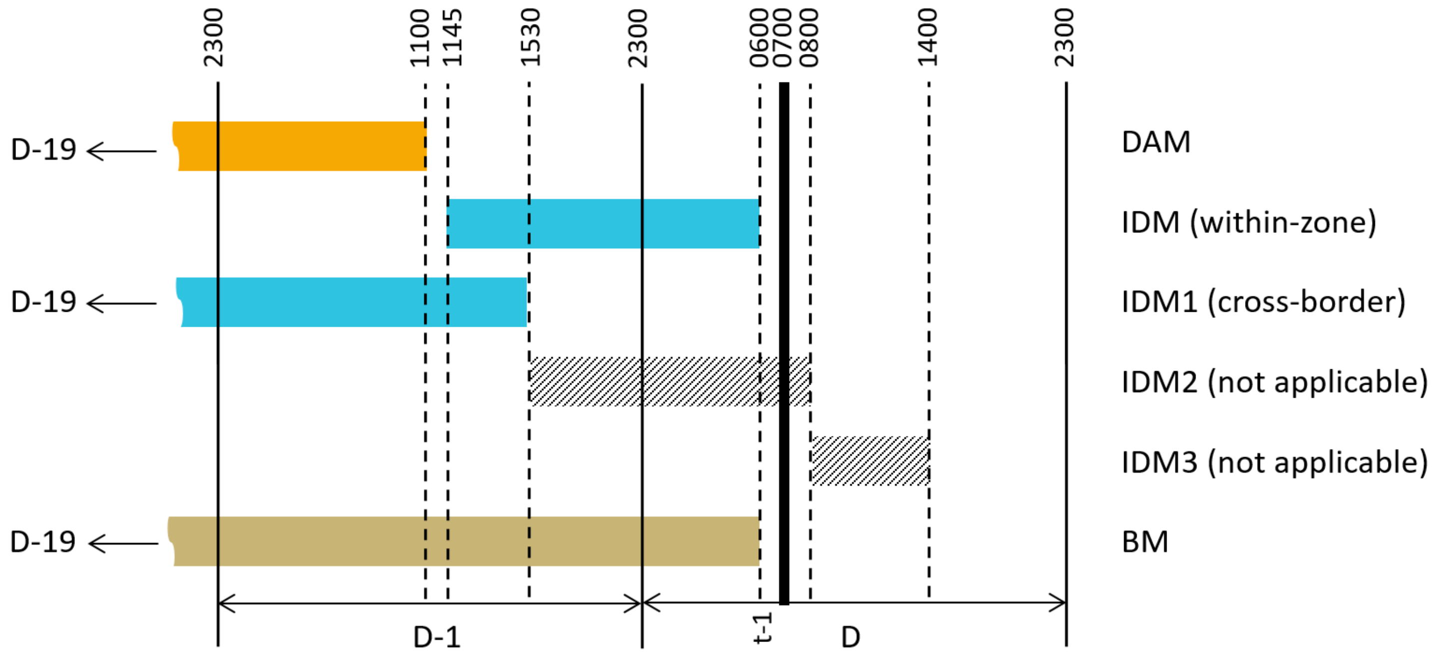

Figure 20 Market submission timelines for trading period 17 (0700–0730) on day D

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5.2 Trading options

It is expected that participants will establish a physical position in the DAM to reduce their exposure in the BM. This affords traders the flexibility of adjusting their position in the IDM up to one hour before real time. Participants can further reduce their risk by adopting arbitrage and hedging strategies prior to entering the ex ante markets.

A capacity provider is most exposed in the CM when the imbalance settlement price is high. Although not required, the expectation is that on peak days, when supply is short, participants will strive to be fully scheduled in the DAM and IDM, and then rely on balancing to bring them down to required levels. In this way, their ex ante schedules ensure they meet their capacity obligations.

5.3 A day in the life of…

The following sections describe a number of hypothetical trading scenarios in a typical day in the I-SEM.

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Important: These scenarios do not constitute advice and are provided only as examples of some trading options that might be available to some participants.

5.3.1 A dispatchable generator

Example—Dispatchable generator with capacity obligation

A 100 MW thermal unit is registered in the SEM as dispatchable generator unit GU1. The generator has previously supplied the TSO with standing technical offer data and commercial offer data (simple and complex) that accurately reflects the normal operating characteristics and costs of each unit. The generator receives capacity payments based on a derated capacity of 90 MW.

Submissions made for GU1 on a typical day are shown in Figure 21 and further described below.

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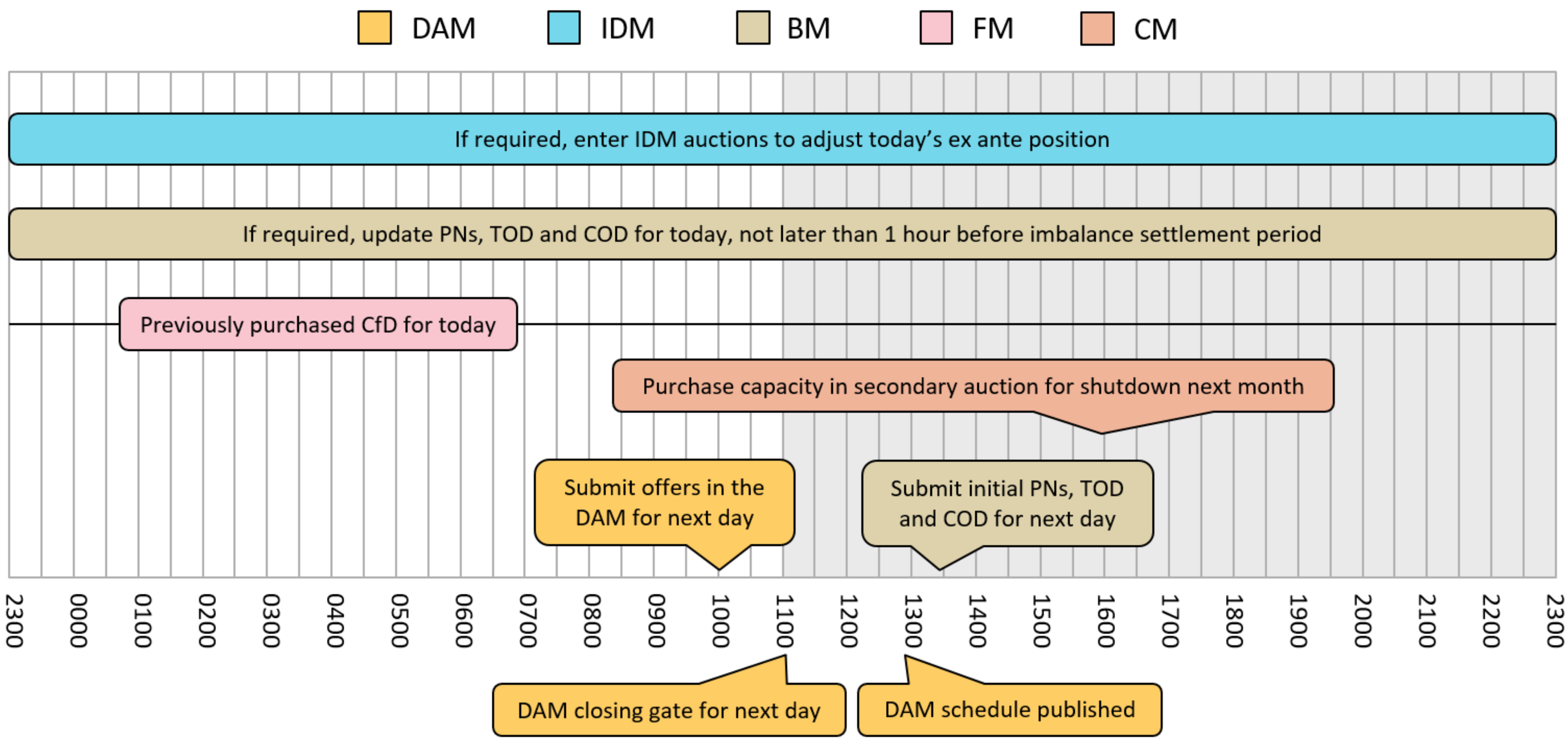

Figure 21 Submissions made by generator GU1 in a typical day

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To ensure that GU1 is scheduled every day, the generator offers 100 MWh on GU1 into the DAM at 0 €/MWh in each of the twenty-four 1-hour trading periods. Assuming GU1 is scheduled, the generator is paid at the DAM spot price in each period. If GU1 is not scheduled in the DAM, the generator enters the IDM on the day to establish its position.

GU1 is constrained up and so is not used by the TSO in system balancing. By being scheduled every hour of every day, the generator also ensures that its capacity obligations on GU1 are met.

GU1 submits TOD and COD to the TSO daily for each of the 48 imbalance settlement periods of the next trading day (commencing 23:00). The TSO will only use the COD if it needs to constrain output on GU1 in balancing. GU1 also submits initial PNs daily for each of the 48 imbalance settlement periods for the next trading day. The PNs reflect the position of its cleared trades in the DAM and IDM for that day. The generator continuously monitors performance and, if required, submits revised PNs on the day, not later than one hour before each imbalance settlement period.

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A typical demand profile over a midweek 24-hour period is shown in Figure 22. The operating cost (ignoring start-up and ramping) for GU1 is 28 €/MWh. The DAM spot price is typically above that level throughout the day, and often peaks above 100 €/MWh for a short period each day (see Figure 21). However, to reduce its exposure to a sustained period of low prices, the generator takes a CfD at a strike price of 40 €/MWh referenced to the DAM, which ensures an operating margin of 12 €/MWh each and every hour of each and every day.

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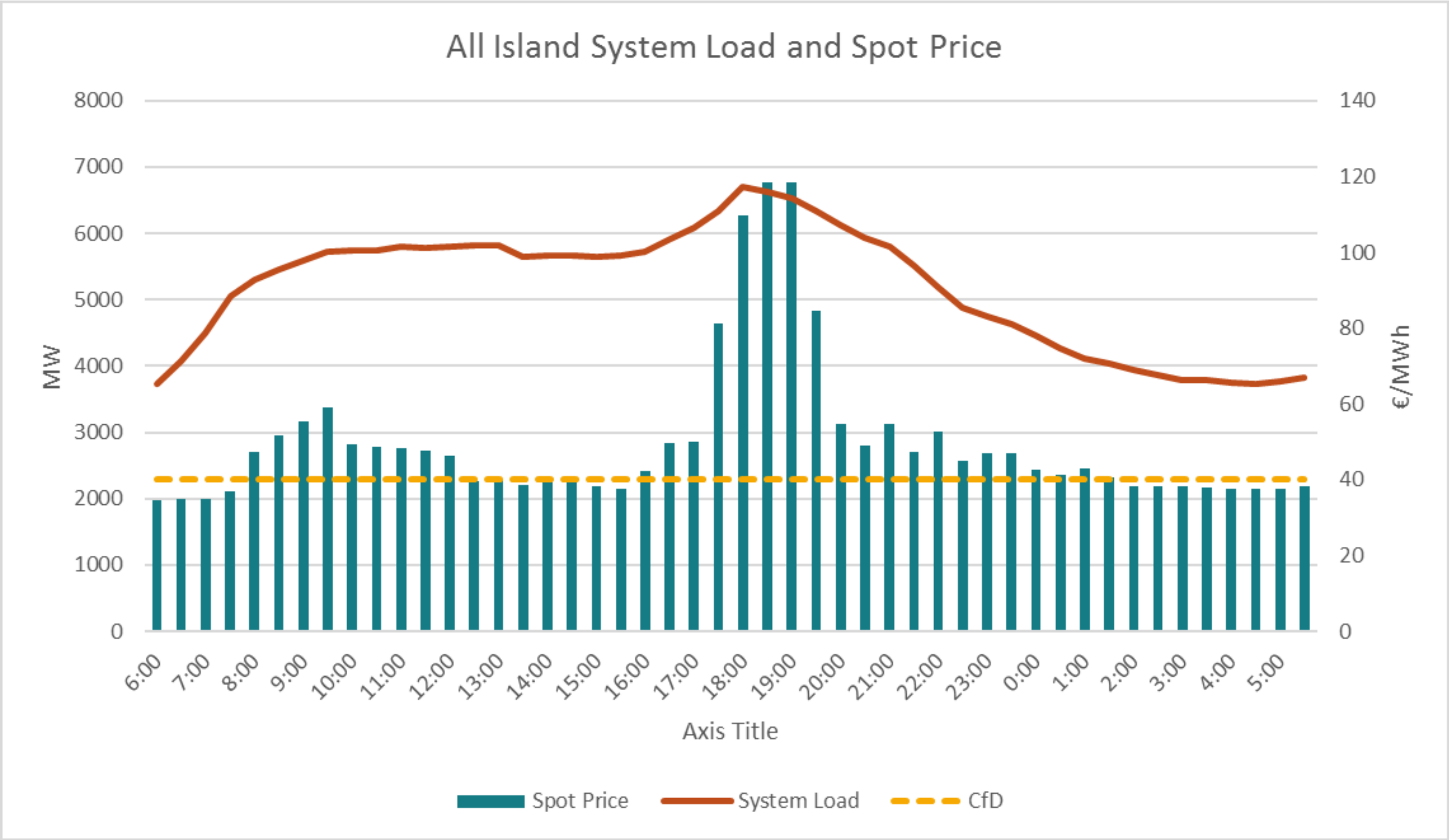

Figure 22 A typical demand profile and day-ahead spot price

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GU1 is scheduled for a 48-hour maintenance shutdown next month. During this period, the generator is financially exposed on GU1 capacity if the spot price exceeds the capacity strike price at any time during that 48 hours. To cover that risk, the generator purchases capacity in the secondary capacity market, but only for the peak periods (8:00 to 10:00 and 17:00 to 20:00) in each of the two days that GU1 is shutdown (auctions aren't run every day, but there is one today).

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Example—Dispatchable generator with no capacity obligation

A 100 MW thermal unit is registered in the SEM as dispatchable generator unit GU2. The generator has previously supplied the TSO with standing technical offer data and commercial offer data (simple and complex) that accurately reflects the operating characteristics and costs of each unit. The GU2 derated capacity is being offered into the secondary capacity market but currently has no capacity obligations.

The submissions made for GU2 on a typical day are shown in Figure 23 and further described below. Note that although the diagram focuses on the peak period during which GU2 expects to be scheduled or deliver balancing services, the TSO can commit GU2 at any time for reasons of system security or balancing.

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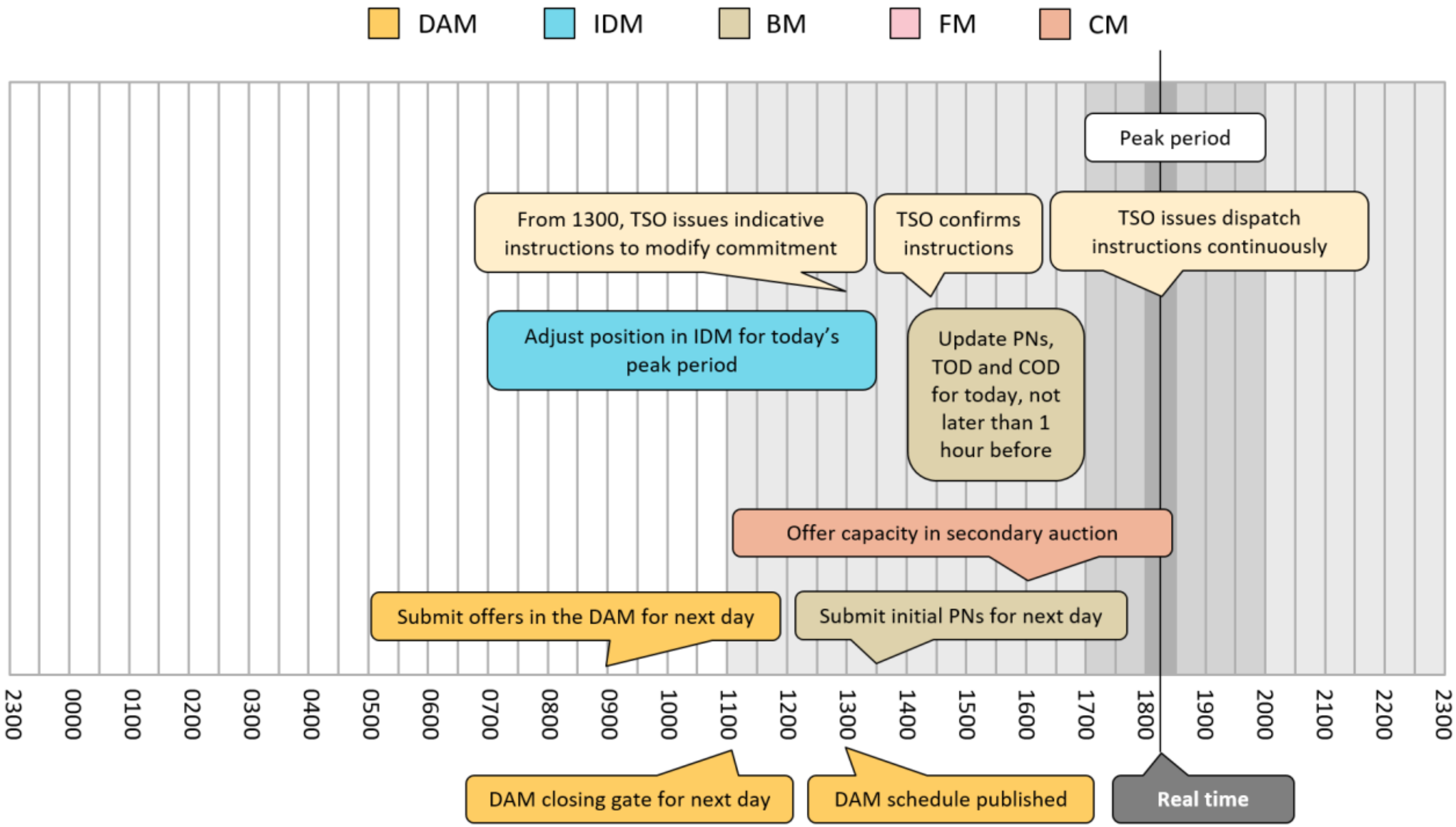

Figure 23 Submissions made by generator GU2 in a typical day

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GU2 is typically cycled each weekday during the peak demand period for approximately 5 hours (see Figure 22), excluding unit start-up, ramp-up and shutdown. The 100 MW output from GU2 is offered into the DAM at a variable price, based on the generator’s own forecast of the level of demand and interconnector flows. The generator continuously assesses the 3-day outlook and places offers and bids in the DAM and IDM to adjust its position as information improves closer to each trading period. The generator’s trading strategy is designed to have 50 MW of the GU2 output scheduled during the peak period, making the remaining 50 MW available for balancing.

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5.3.2 A wind generator

Consider a wind farm comprising 12 wind turbines with a maximum combined generating capacity of 30 MW (each turbine has a rated maximum output capacity of 2.5 MW). The wind forecast for the next 24-hour period ranges between 12 and 46 kph and resulting power output ranges between 385 and 1650 kW.

The generator previously submitted offers prior to DAM gate closure the day before, which was based on the forecast available at that time. After the DAM clears for the next day, the generator also submitted a PN to the TSO that reflected its cleared trades.

The generator continuously reviews the wind and demand forecast for the next 24 hours (Figure 24) and adjusts its position as the forecast changes by placing offers and bids in the IDM not later than one hour before each 30-minute trading period. If the trade clears before the BM gate closure, the generator also updates its PN.

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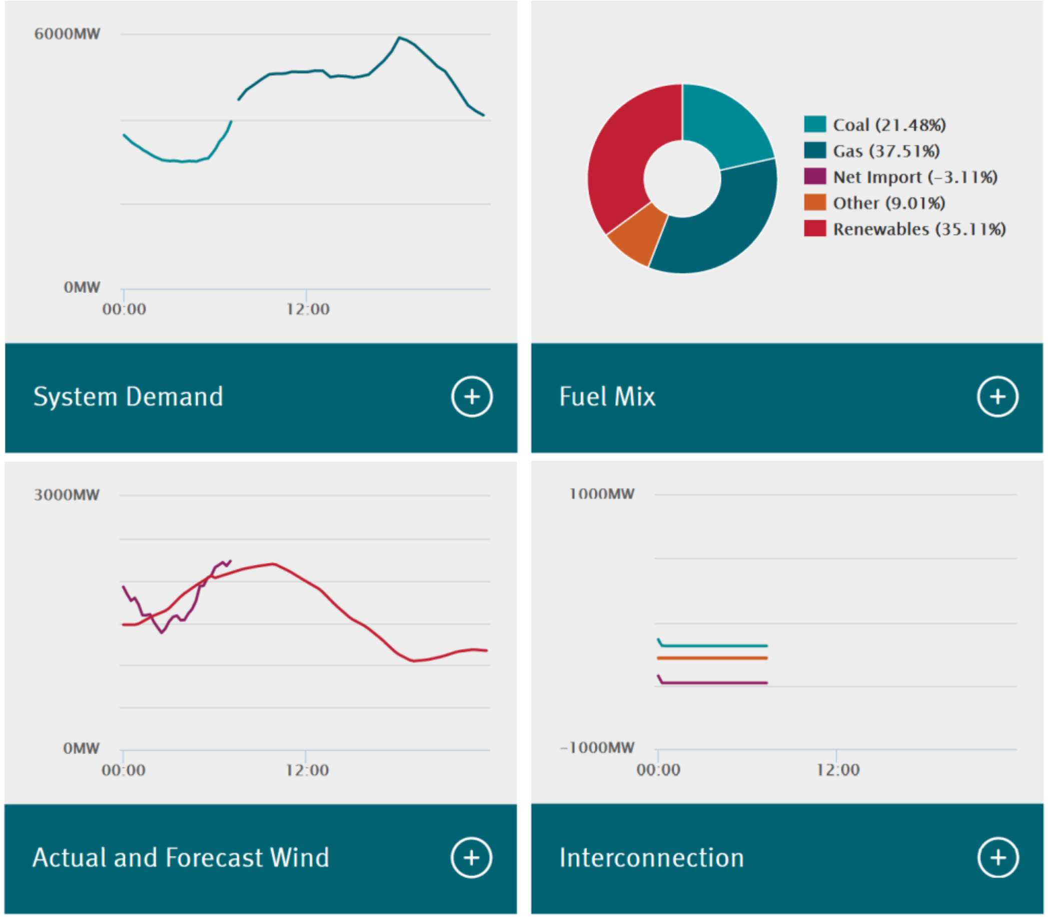

Figure 24 Eirgrid system information dashboard[34]

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5.3.3 A supplier

Consider a supplier on the island of Ireland with a forecast next-day demand of 500 MWh with a retail value of 65 €/MWh. The supplier uses its own forecast to place bids in the DAM ranging from 35 €/MWh to 85 €/MWh. The supplier also holds a CfD at a strike price of 50 €/MWh referenced to the DAM to protect it against price volatility.

For a specific trading period in which the forecast demand is 20 MWh, if the DAM spot price is 45 €/MWh, the supplier's bid of 65 €/MWh clears at 45 €/MWh. The DAM spot price is lower than the CfD strike price, so the supplier pays the CfD seller the spread of 5 €/MWh on the 20 MWh, and earns a profit of €300 for that hour, being the difference between the retail price and the strike price (65 x 20 – 45 x 20 – [50 – 45] x 20).

However, if the spot price is 100 €/MWh, the supplier, in this example, will not be scheduled in the DAM. After publication of the DAM results (13:00 the day before), the supplier then bids in the IDM cross-border auctions and succeeds in purchasing 20 MWh at 110 €/MWh.

The DAM spot price (100 €/MWh) is higher than the strike price (50 €/MWh), so the supplier is paid by the CfD seller the difference of 50 €/MWh on the entire 20 MWh. The supplier earns a profit of €100 for that hour (65 x 20 – 110 x 20 – [50 – 100] x 20), being the difference between the retail price and the IDM purchase price plus the CfD-DAM spread.

5.3.4 An assetless trader

An assetless trader arbitrages its position between the DAM and IDM. To ensure that it achieves a zero energy position before the BM gate closure, any trades cleared in the DAM must be reversed in the IDM.

The assetless trader continuously reviews the wind and demand forecast for the next 24 hours (Figure 24) and exits its position by placing offers and bids in the IDM not later than one hour before each 30-minute trading period.

For example, an assetless trader places a bid in the DAM for 50 MWh at 25 €/MWh for each 1-hour trading period between 7:00 and 10:00 the next day (D). The DAM closes at 11:00 D-1 and, when the results are published at 13:00, the assetless trader is informed that all three bids were successful. The assetless trader's exposure before entering the IDM is the spread between the DAM market price and the imbalance settlement price in each corresponding imbalance settlement period.

The assetless trader then offers the energy into the same periods in the IDM within-zone (continuous matching) or cross-border auctions. The IDM trading period is 30 minutes, so the DAM trade is split equally between each half-hour period. So, to reduce its exposure in the BM, the assetless trader offers 25 MWh at 35 €/MWh into the six trading periods between 7:00 and 10:00 the next day (D), thereby making a profit, if cleared, of €250 in each period.

References

32. http://www.eirgridgroup.com/how-the-grid-works/system-information/