EirGrid Ex-Post Outturn Availability Connection Asset Maintenance Report for the 2020 Outage Season

Introduction and Background

The Single Electricity Market Committee (SEMC) decision SEM-15-071 “Process for the Calculation of Outturn Availability” was published on 29 September 2015. The decision applies to both transmission and distribution connected Centrally Dispatched Generating Units (CDGUs) and Controllable Wind Farm Power Stations (WFPS) which are disconnected as a direct result of a transmission outage scheduled by the TSO. Outages on the distribution system are not related to the decision paper.

This Ex-Post Outturn Availability Connection Asset (OACA) Maintenance Report contains details of the maintenance of OACAs for the 2020 outage season, in accordance with the SEMC decision.

The OACAs of a generation unit include any transmission equipment between and including the Connection Point and the busbar disconnects at the Transmission Station. Annual maintenance on connection assets associated with the relevant generation unit may disconnect a generation unit that is technically available at the connection point. This maintenance is scheduled by TSO and carried out by the TAO. A summary report of the outage schedule to facilitate this maintenance work is published annually at the start of each calendar year. A summary of the outage schedule at the end of each year is published. This is included in Appendix 3. Differences between the Ex-Ante and the Ex-Post summary are identified in the Overview of 2020 Outage Season.

Other documents to be considered when reviewing this report include

- SEM-15-071 Outturn Availability Decision Paper
- SEM-15-106 Outturn Availability addendum to SEM-15-071
- The EirGrid and SONI Implementation Approach to the SEM Committee Decision Paper SEM-15-071
- EirGrid Ex-Ante Outturn Availability Connection Asset Maintenance Plan for the 2020 Outage Season

Overview of the 2020 Outage Season

During the 2020 outage season:

- 101 OACA outages were processed. This figure was subject to in-season change as network configurations changed and as facilities moved to Controllable status in the market.
- 57 scheduled generator outages were planned in the Committed Outage Programme (COP) at the start of 2020. In season:
    - The TSO approved more than 76 changes to the generator outage dates as published in the COP.
    - The TSO received 80 Short-Term Maintenance Outage requests (STMOs as described on the EirGrid website) of which 69 were accommodated.

The results of the season are presented here, with descriptions and supporting information contained in the Appendices.

The figures below outline percentage changes under a number of different categories. Each category is described in detail in Appendix 2. Percentages are reported based on the Transmission Outage Programme Identification Number (TOP-IDs)[1] of TSO scheduled works. A TOP-ID is a unique identifier assigned for each outage and was linked to one specific connection asset.

As a generation unit's OACAs may contain several unique assets it may in turn have more than one TOP-ID for planned outages. For example, one TOP-ID may be linked to a generator transformer bay, while another TOP-ID may be linked to the cable from the meshed transmission station to that same generator transformer bay. As such, some TOP-IDs are intrinsically linked and a change of the works associated with one TOP-ID may also be linked to a change of the linked TOP-ID.

As noted above, Appendix 2 describes the categories for which changes are reported for each TOP-ID. For each reporting category for each TOP-ID, Appendix 3 reports whether there was a change to any work item. In the following pages, graphs are presented showing the percentage changes for each of the reporting categories. The percentage change is divided into five groupings, "TSO Driven Change", "TAO Driven Change", "Generator Driven Change", "COVID-19 Driven Change" and "Non-Specific Change". "Non-Specific Change" covers the situation where the reason for the change is not directly applicable to the TSO, TAO or the generator.

[1] The EirGrid Ex-Ante Outturn Availability Connection Asset Annual Maintenance Plan 2020 assigned an identifying number referred to as the TOP-ID to each outage. This TOP-ID started with the letters TO, for example the TOP-ID for the outage of a circuit between station1 and station2 may be TO-19-ST1-ST2-1-01.

The Transmission Outage Programme (TOP) process introduced in 2016, which issued indicative windows as opposed to specific outage dates at the start of the season, successfully accommodated the majority of generator outage changes without adversely impacting the programme. As shown in Figure 1, of all the indicative windows communicated in February 2020, approximately 30% remained unchanged at the end of the season, with 34% of the change driven by disruption caused by COVID-19 mitigation measures.

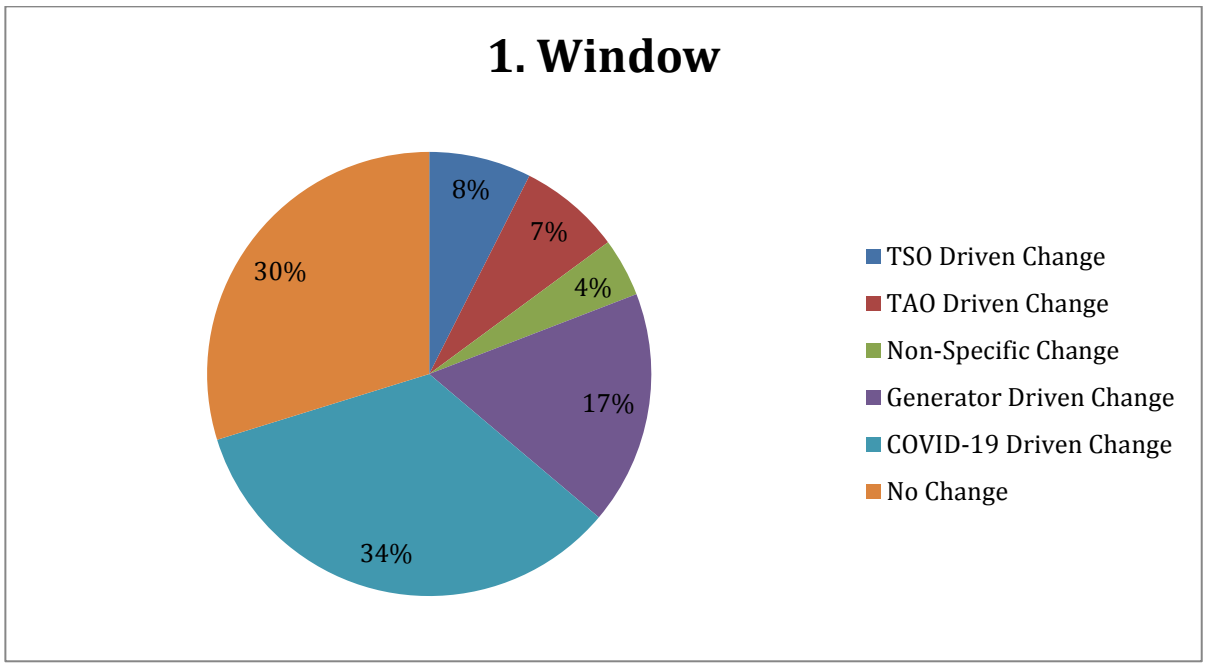

Figure 1: Category 1 - Indicative window communicated ex-ante

Figure 2 shows that 74% of the initial durations communicated ex-ante remained unchanged from the start of the season. Of the 26% of durations that did change, these were related to TSO and TAO change requests.

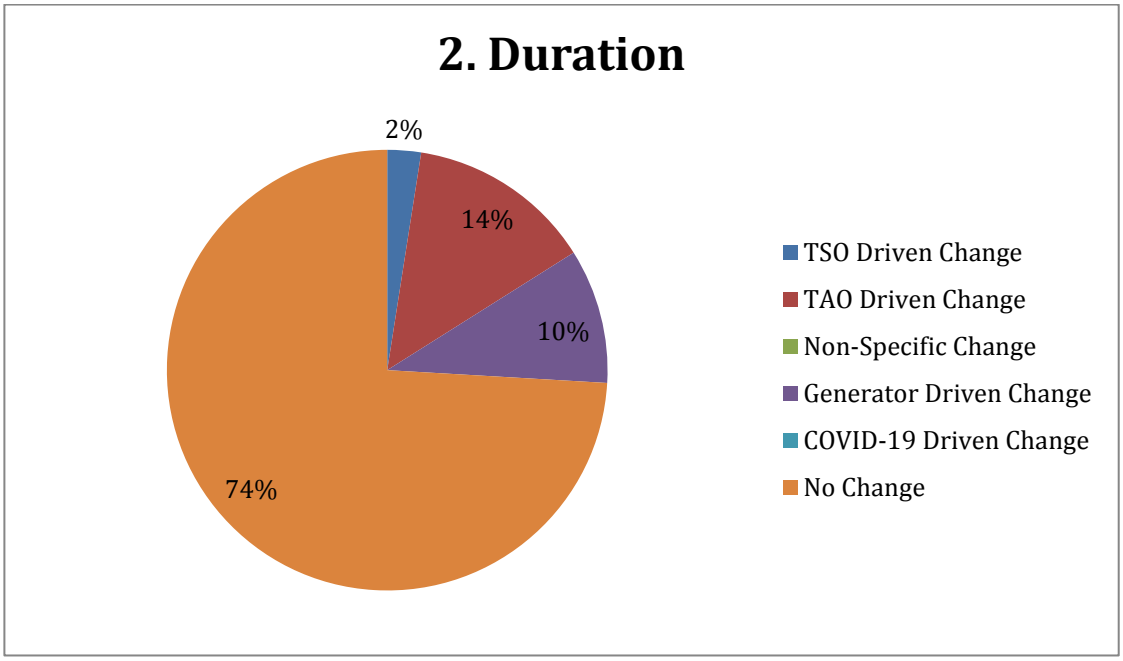

Figure 2: Category 2 - Initial duration communicated ex-ante

As shown in Figure 3 changes in the scheduled days communicated ex-ante largely originated from changes in generator outage dates, either as a direct result of COVID-19 mitigation measures or generator's own requests. Additional changes were due TAO or TSO having to postpone or reschedule work or the TAO completing work quicker than the originally communicated duration.

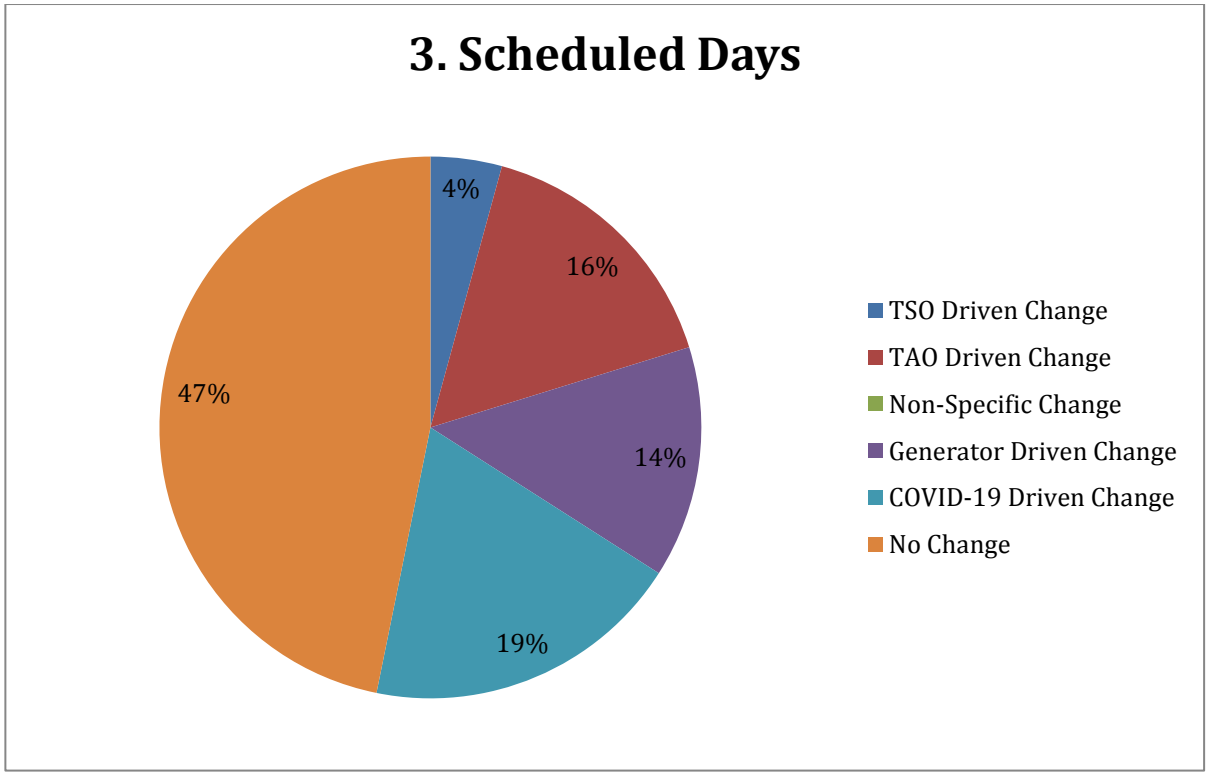

Figure 3: Category 3 - Scheduled days communicated ex-ante

Figure 4 shows that 53% of the designated days communicated ex-ante remained unchanged. Sources of change included COVID-19 driven changes to generator outage dates, facilitation of high priority works and TSO cancellation due to system security concerns.

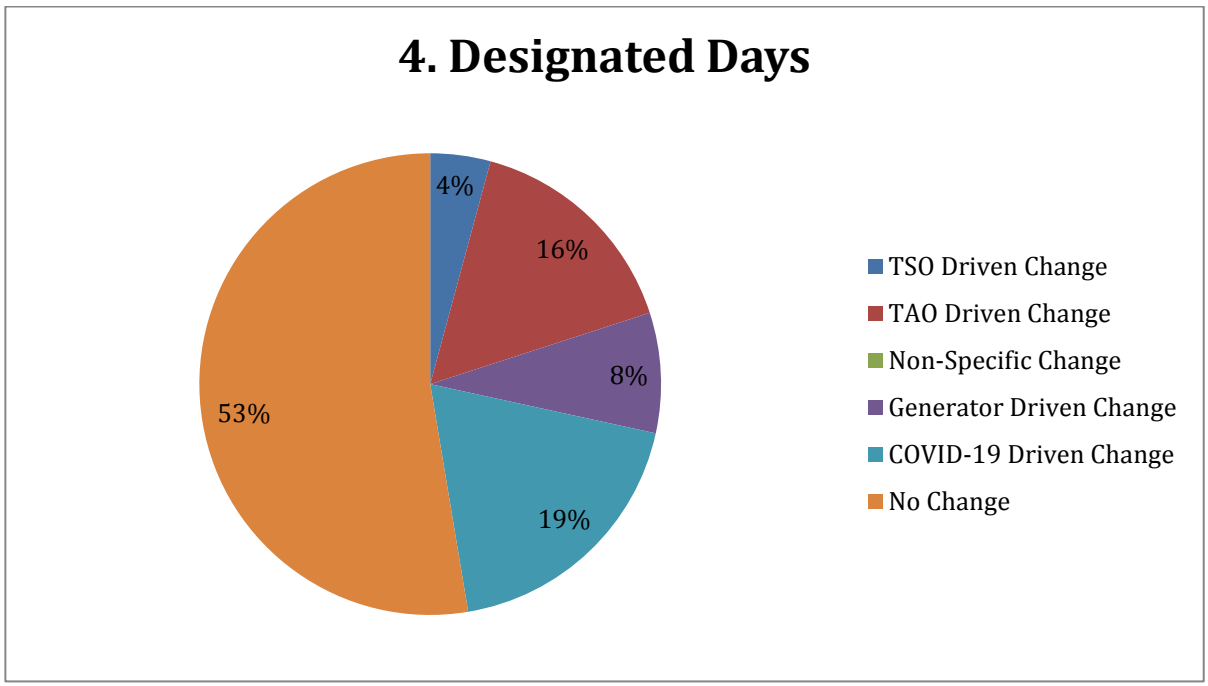

Figure 4: Category 4 - Designated days communicated ex-ante

Changes to works description communicated ex-ante in Figure 5 covers the situation where the corrective maintenance tasks were added in season or work items were

incorrectly in the plan as they had been completed in a previous outage season. This was primarily due to lag in the closure of completion reports from the previous season leading to work items remaining open.

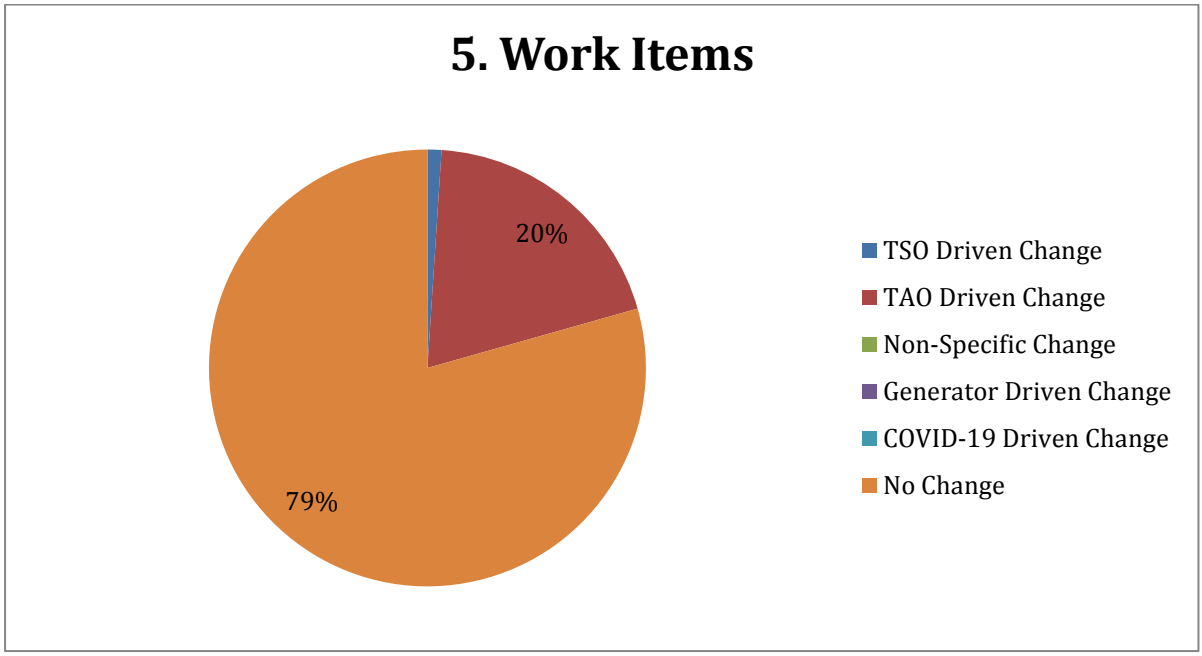

Figure 5: Category 5 - Works description communicated ex-ante

Figure 6 shows the percentage of TOP-IDs (each of which contained a number of individual work items) where the associated plant (both wind and conventional) changed its outage dates.

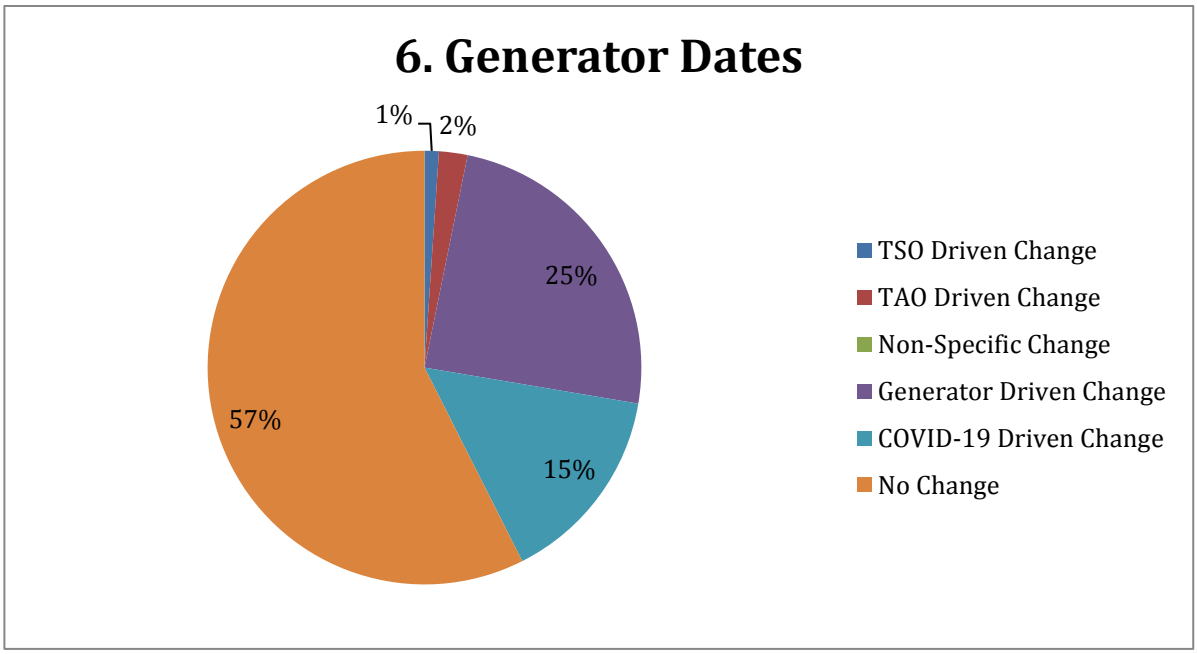

Figure 6: Category 6 - Generator outage dates

Figure 7 shows the breakdown of scheduled works that were not completed in 2020. 69% of works went ahead as planned with the majority of the remainder not being done due to a number of reasons determined by either the TSO or the TAO. This compares with a completion figure of 81% in 2019, with the difference being primarily driven by disruption caused by COVID-19 mitigation measures.

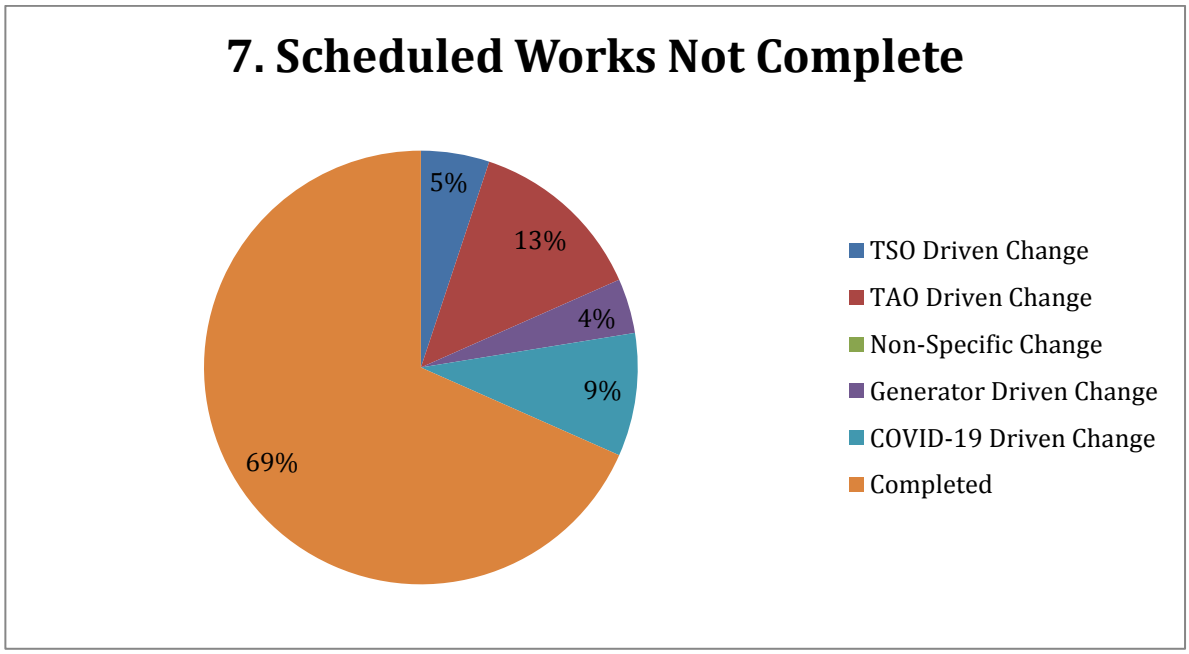

Figure 7: Category 7 - Scheduled Works Not Completed

Figure 8 shows the number of conventional Centrally Dispatched Generation Units (CDGUs) and the number of changes to the COP processed by the TSO in 2020. It is noted that several generation units have changed their COP dates more than once and this is included in the graph. For each change, system studies to assess the impact of the proposed change on system security and the transmission outage programme are carried out by the TSO. The TSO must also assess system capacity margins.

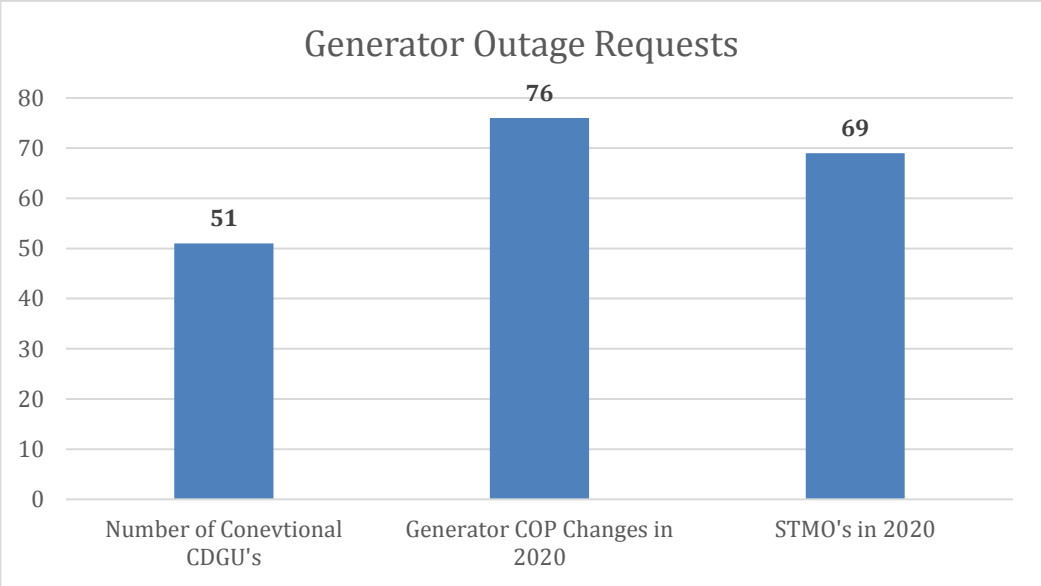

Figure 8: Generator change requests processed in 2020

In season, the TSO approved 76 changes to the generator outage dates as published in the COP. STMOs are short, opportunistic maintenance outages, typically carried out at low load periods - overnight or at the weekend and which generally last for less than 48 hours. 69 of these requests were accommodated in 2020.

Initiatives for improvement

This is the fifth Ex-Post Outturn Availability (OA) report published by the TSO in cooperation with the TAO, in fulfilment of the requirements of SEM-15-071. As the fifth such report, feedback from the 2020 Ex-Post forum will be factored into the 2021 season's tracking and reporting and subsequently the ex-post report to improve transparency and quality of service to energy producers on the grid.

Appendix 1: Transmission Outage Programme Timelines

A full programme of work for the year ahead was developed in February 2020; this had work items classified as Scheduled, Planned or Unscheduled. Outages several months in the future were initially classified as Planned. As the outage window approached, the outage moved to a proposed/scheduled state. These outage classifications are described in Table 1.

Table 1: Outage states throughout the season.

Outage Classification	**Outage Description**
Planned	A viable outage window (date range) identified in which a fixed duration of work is to be carried out. Works were not assigned specific dates until later in the outage season, for example works which are not expected to take place until several months in the future.
Proposed	An outage slot for the work to be completed in, with specific proposed start and end dates. These dates were proposed approximately 6 weeks before the start of the relevant month and were subject to further refinement in discussion with the TAO.
Scheduled	Outages scheduled with specified start and end dates, where these dates are unlikely to change. The outage dates are scheduled approximately 4 weeks before the start of the relevant month.
Unscheduled	Outages with could not be accommodated in the first release of the Transmission Outage Programme but would be scheduled later in the programme.

Table 2 shows an example of how the works were communicated to generators at the start of the season.

Table 2: Example of works communicated to generator in February 2020

GENERATOR TRANSFORMER – XXXX

TO-18-XX-T103-01 Window: **Jun** Status: **Indicative**

WORK	LOCATION		WORK ID	STATUS	DAYS	DESCRIPTION/COMMENTS
					X	Total Maintenance Outage Duration Requested
XXX	CD			DO	X	Works Description

Details of designated days for Outturn Availability purposes were assigned when the outage was scheduled (i.e. when the outage moved to the scheduled state which typically happened 4 weeks in advance of the relevant month).

Appendix 2: Ex-Post Reporting Format

This appendix lists how changes in the 2020 scheduled OACAs maintenance works are reported in the spreadsheet linked in Appendix 3. Changes to the seven distinct categories described in detail in Table 3 are reported in Excel spreadsheet format in Appendix 3 on a work item by work item basis for each TOP-ID. Where a change occurred to any category during the year for a TOP-ID, this is indicated with a Yes in the relevant spreadsheet column under each category heading. Reasons for change are also then recorded in a subsequent column under the same category heading. In total there are seven reporting categories, each with three sub-headings, recording whether there was a change to the category, what the reason for change was and who was responsible for driving the change.

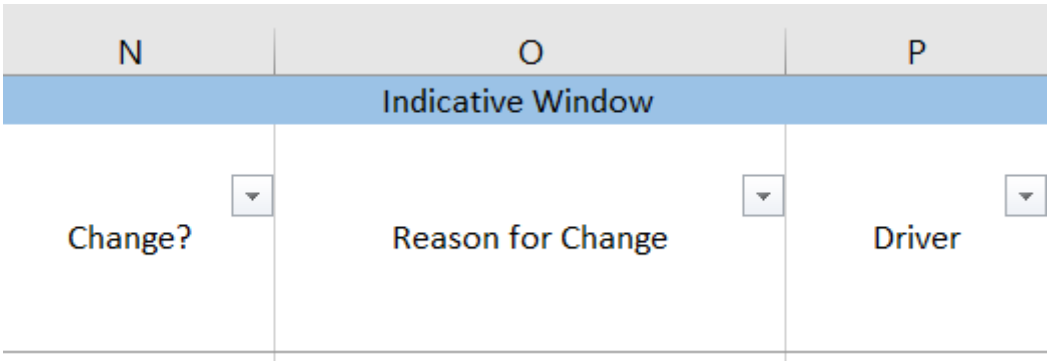

Figure 9: Layout of Reporting Data in Excel Format

The categories 1 to 7 are explained as follows in Table 3 below.

Table 3: Description of the reporting categories

#	Category	Category Description
1	*Indicative window communicated ex-ante*	This category highlights if the outage occurred in the indicative outage window communicated to the generator at the start of the outage season.
2	*Initial duration communicated ex-ante*	This indicates if the outage took the number of days communicated to the generator at the start of the outage season.
3	*Scheduled days communicated ex-ante*	This category indicates if the outage occurred on the days communicated to the generation unit when the outage became scheduled (i.e. 4 weeks before the start of the month in which the works took place).
4	*Designated days communicated ex-ante*	This category indicates if the designated days (i.e. one of the five days where the generator is not outturn available for maintenance) were changed from those communicated to the generator when the outage became scheduled.
5	*Works description communicated ex-*	A change to this category indicates that the works description changed from those communicated to the generator at the start

	ante	of the outage season.
6	*Generator outage dates*	A change to this category indicates that the generator applied to the TSO to change their generator outage date as published in the Committed Outage Programme (COP).
7	*Scheduled works not completed*	This category indicates if any one of the work items scheduled under the TOP-ID prior to the outage was not completed.

Please note:

- Where a work item incorrectly appeared in the EirGrid Ex-Ante Outturn Availability Connection Asset Maintenance Report, e.g. the work item had been completed in a previous outage season, this was logged as a change under 5. *Works description communicated ex-ante* rather than as a change under 7. *Scheduled works not completed*.
- 2. *Initial duration communicated ex-ante* refers to the duration to complete the maintenance works. If the outage duration was increased to complete capital works or to align with a generator requested outage and not due to the maintenance works taking longer it is not logged as a change under this category.

Appendix 3: Ex-Post Reporting Format

In this appendix, the OACA maintenance report lists changes as per points 1 to 7 from Table 3. The link below points to the report in Excel format on the EirGrid website.

Within the spreadsheet, each individual work item's duration is the amount of time that this work item would have taken if completed in isolation (i.e. without any other work items completed in parallel).

The spreadsheet can be located on the EirGrid website **here**.