

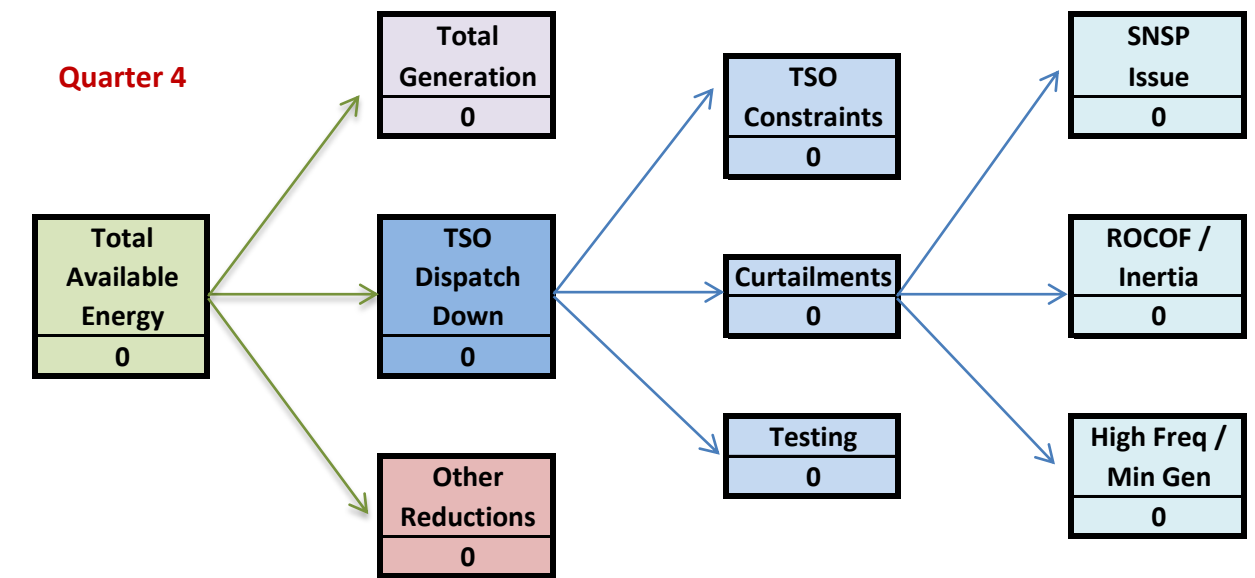
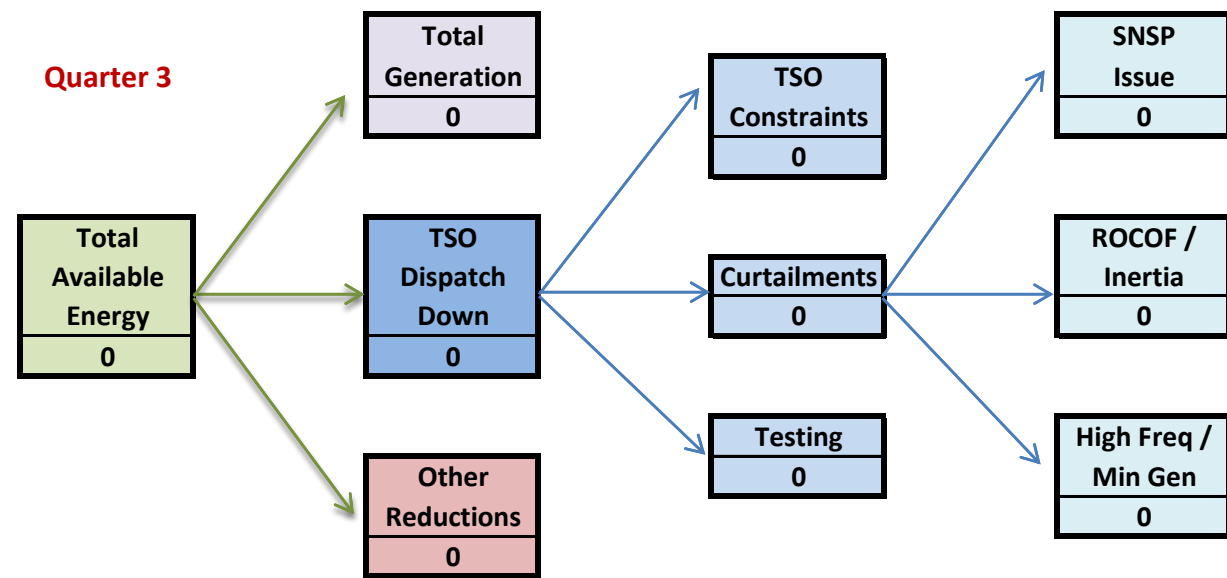
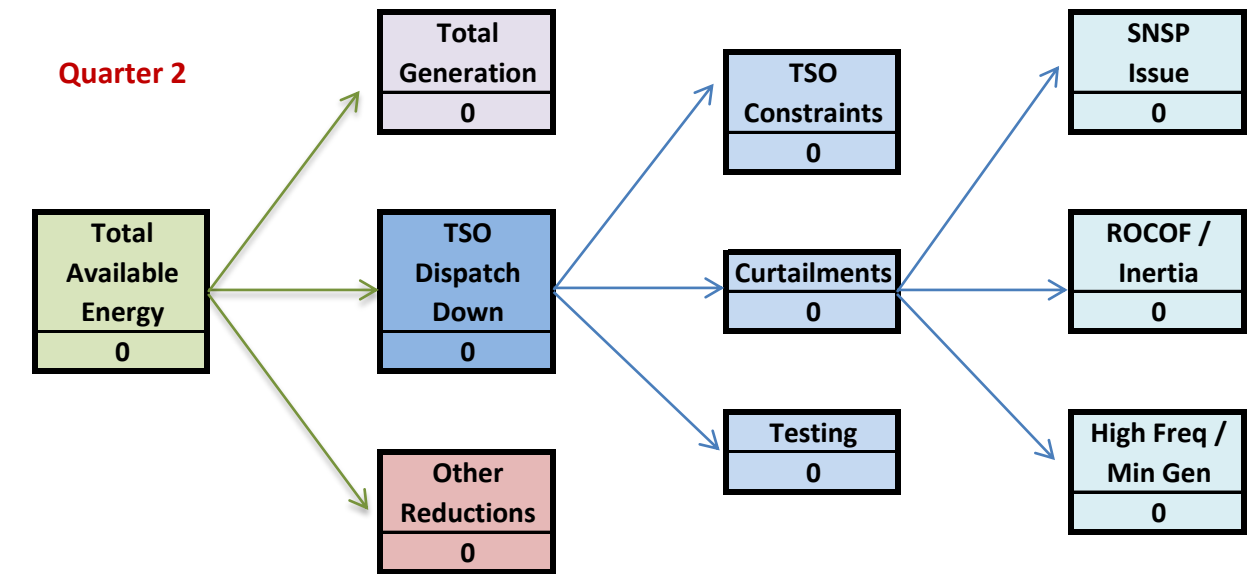
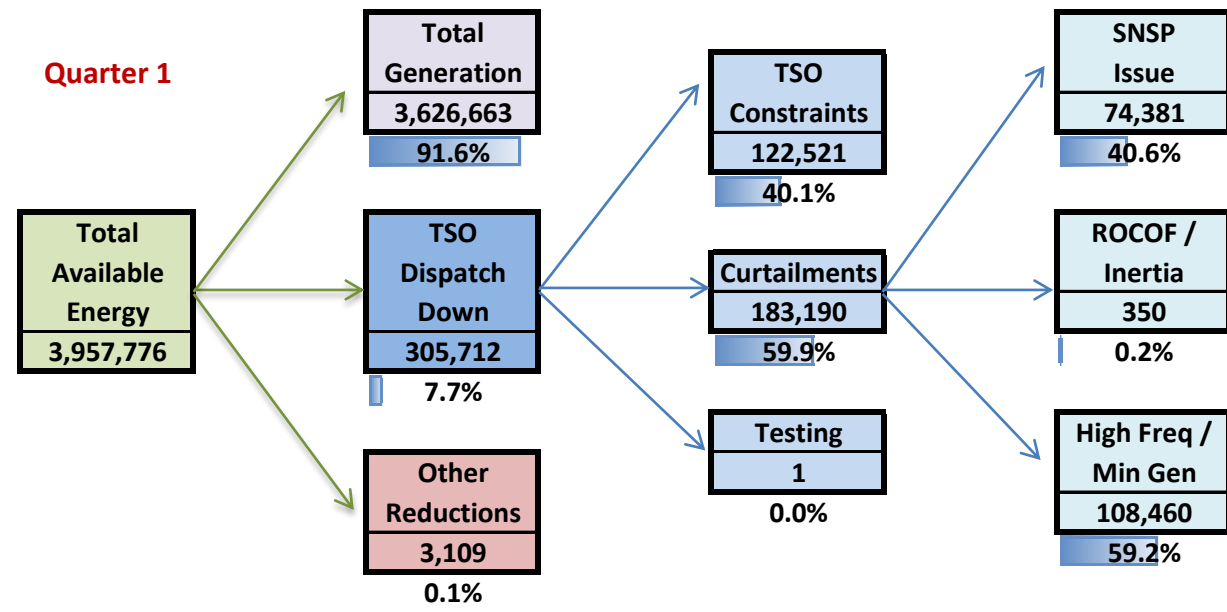
Volumes (MWh)	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2019
Available Energy	1,035,718	1,559,040	1,363,019	3,957,776	-	-	-	-	-	-	-	-	-	-	-	-	3,957,776
Generation	979,573	1,428,284	1,218,806	3,626,663	-	-	-	-	-	-	-	-	-	-	-	-	3,626,663
TSO Dispatch Down	52,818	119,627	133,267	305,712	-	-	-	-	-	-	-	-	-	-	-	-	305,712
Other Reductions	155	1,398	1,556	3,109	-	-	-	-	-	-	-	-	-	-	-	-	3,109
TSO Dispatch Down:																	
TSO Constraints	11,307	30,212	81,003	122,521	-	-	-	-	-	-	-	-	-	-	-	-	122,521
Curtailments	41,511	89,415	52,264	183,190	-	-	-	-	-	-	-	-	-	-	-	-	183,190
TSO Testing	0	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Curtailments:																	
SNSP Issue	7,480	46,682	20,219	74,381	-	-	-	-	-	-	-	-	-	-	-	-	74,381
ROCOF / Inertia	-	-	350	350	-	-	-	-	-	-	-	-	-	-	-	-	350
High Freq / Min Gen	34,031	42,733	31,696	108,460	-	-	-	-	-	-	-	-	-	-	-	-	108,460

Percentages	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2019
Generation	94.6%	91.6%	89.4%	91.6%													91.6%
TSO Dispatch Down	5.1%	7.7%	9.8%	7.7%													7.7%
Other Reductions	0.0%	0.1%	0.1%	0.1%													0.1%
TSO Dispatch Down:																	
TSO Constraints	21.4%	25.3%	60.8%	40.1%													40.1%
Curtailments	78.6%	74.7%	39.2%	59.9%													59.9%
TSO Testing	0.0%	0.0%	0.0%	0.0%													0.0%
Curtailments:																	
SNSP Issue	18.0%	52.2%	38.7%	40.6%													40.6%
ROCOF / Inertia	0.0%	0.0%	0.7%	0.2%													0.2%
High Freq / Min Gen	82.0%	47.8%	60.6%	59.2%													59.2%

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Graphical Representation of the Breakdown of Wind Dispatch Down Energy Volumes (MWh) and Percentages (%)



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Historical Wind Dispatch Down (Constraint and Curtailment) Percentages for Ireland (IE), Northern Ireland (NI) and All Island (AI)

Month	2011			2012			2013			2014			2015			2016			2017			2018			2019		
	NI	IE	AI	NI	IE	AI	NI	IE	AI	NI	IE	AI	NI	IE	AI	NI	IE	AI	NI	IE	AI	NI	IE	AI	NI	IE	AI
Jan	0.0%	0.8%	0.6%	0.5%	2.2%	1.9%	0.7%	0.4%	0.5%	2.9%	4.9%	4.5%	4.3%	4.3%	4.3%	3.4%	3.5%	3.5%	2.4%	1.9%	2.0%	5.7%	3.5%	3.9%	9.7%	3.8%	5.1%
Feb	0.0%	0.6%	0.5%	0.2%	2.8%	2.2%	0.3%	0.7%	0.6%	3.2%	3.7%	3.6%	4.6%	4.1%	4.2%	2.3%	3.3%	3.1%	2.0%	1.7%	1.7%	2.9%	2.0%	2.2%	10.7%	6.8%	7.7%
Mar	2.7%	1.8%	2.0%	0.8%	2.4%	2.0%	0.6%	0.3%	0.3%	1.8%	4.0%	3.5%	11.4%	8.0%	8.8%	0.9%	2.4%	2.1%	3.0%	3.4%	3.3%	5.9%	4.4%	4.7%	11.8%	9.2%	9.8%
Qtr1	0.7%	1.0%	0.9%	0.5%	2.4%	2.0%	0.6%	0.4%	0.5%	2.7%	4.2%	3.9%	6.9%	5.4%	5.8%	2.4%	3.2%	3.0%	2.4%	2.3%	2.4%	4.9%	3.3%	3.6%	10.8%	6.8%	7.7%
Apr	1.3%	1.2%	1.3%	0.2%	1.4%	1.2%	2.6%	4.7%	4.3%	1.8%	4.2%	3.7%	2.8%	1.8%	2.0%	0.8%	1.4%	1.3%	4.2%	3.5%	3.6%	19.2%	7.4%	9.8%			
May	2.2%	3.5%	3.2%	0.6%	1.6%	1.4%	3.7%	6.1%	5.6%	1.5%	2.8%	2.5%	3.8%	4.5%	4.3%	1.1%	1.2%	1.2%	3.6%	3.5%	3.5%	6.1%	4.7%	5.0%			
Jun	0.4%	0.8%	0.7%	0.4%	4.0%	3.3%	1.9%	3.7%	3.4%	0.6%	3.3%	2.7%	4.2%	5.0%	4.8%	0.3%	0.7%	0.7%	4.7%	3.9%	4.1%	11.0%	8.0%	8.6%			
Qtr2	1.6%	2.3%	2.2%	0.4%	2.2%	1.9%	2.9%	5.0%	4.6%	1.5%	3.4%	3.0%	3.7%	3.9%	3.8%	0.8%	1.2%	1.1%	4.2%	3.7%	3.8%	13.0%	6.6%	8.0%			
Jul	0.2%	3.3%	2.8%	0.5%	1.9%	1.6%	0.8%	4.2%	3.4%	1.6%	3.9%	3.4%	2.8%	3.8%	3.7%	6.2%	2.3%	3.1%	4.4%	2.8%	3.2%	2.1%	1.9%	2.0%			
Aug	0.0%	0.7%	0.5%	4.0%	4.2%	4.1%	2.4%	5.4%	4.7%	3.8%	3.5%	3.6%	5.0%	5.8%	5.6%	7.0%	4.6%	5.0%	3.1%	2.8%	2.9%	5.8%	2.2%	3.0%			
Sep	2.4%	3.9%	3.7%	0.4%	4.8%	3.7%	0.5%	4.2%	3.3%	0.1%	2.2%	1.8%	1.5%	2.7%	2.5%	5.8%	5.6%	5.6%	4.2%	5.4%	5.1%	13.1%	5.5%	7.4%			
Qtr3	1.5%	3.1%	2.8%	1.5%	3.8%	3.3%	1.3%	4.6%	3.9%	2.4%	3.3%	3.1%	3.1%	4.1%	3.9%	6.3%	4.4%	4.8%	3.9%	3.9%	3.9%	8.7%	3.6%	4.8%			
Oct	2.4%	4.7%	4.3%	0.0%	0.3%	0.2%	1.6%	5.9%	5.0%	4.5%	8.2%	7.4%	4.2%	3.8%	3.9%	1.9%	1.8%	1.8%	14.6%	9.2%	10.6%	10.2%	6.9%	7.7%			
Nov	1.2%	2.3%	2.1%	0.1%	1.0%	0.8%	4.0%	3.0%	3.2%	2.0%	3.2%	3.0%	6.9%	6.8%	6.9%	2.7%	1.0%	1.3%	3.2%	2.5%	2.6%	10.2%	5.2%	6.4%			
Dec	0.7%	2.2%	1.9%	0.8%	2.8%	2.5%	2.0%	4.4%	3.8%	4.5%	5.0%	4.9%	6.2%	6.3%	6.3%	3.8%	3.1%	3.3%	5.3%	2.5%	3.1%	14.9%	7.2%	8.9%			
Qtr4	1.4%	2.9%	2.6%	0.4%	1.6%	1.4%	2.4%	4.5%	4.0%	3.9%	5.7%	5.3%	6.1%	6.0%	6.0%	3.0%	2.1%	2.3%	8.5%	4.9%	5.7%	11.7%	6.4%	7.7%			
Year Total DD	1.3%	2.4%	2.2%	0.7%	2.5%	2.1%	1.9%	3.5%	3.2%	2.8%	4.4%	4.1%	5.3%	5.1%	5.1%	3.2%	2.8%	2.9%	5.0%	3.7%	4.0%	9.4%	5.0%	6.0%	10.8%	6.8%	7.7%
Constraints	0.3%	0.5%	0.4%	0.3%	0.9%	0.8%	0.5%	1.0%	0.9%	1.0%	1.5%	1.4%	1.9%	1.8%	1.8%	1.3%	1.4%	1.4%	1.9%	1.0%	1.2%	4.0%	1.7%	2.2%	3.6%	2.9%	3.1%
Curtailments	1.1%	2.0%	1.8%	0.4%	1.5%	1.3%	1.3%	2.5%	2.3%	1.8%	2.9%	2.6%	3.4%	3.3%	3.3%	1.9%	1.4%	1.5%	3.1%	2.6%	2.7%	5.4%	3.3%	3.8%	7.2%	3.9%	4.6%
Wind Installed Capacity (MW)	512	1,585	2,097	600	1,703	2,303	640	1,923	2,563	729	2,266	2,996	751	2,447	3,198	943	2,779	3,722	1,154	3,314	4,467	1,276	3,666	4,942			
Wind Generation (GWh)	943	4,256	5,198	1,020	4,102	5,122	1,259	4,642	5,901	1,453	5,116	6,568	1,803	6,537	8,339	1,725	6,115	7,840	2,051	7,229	9,280	2,391	8,685	11,076			
Wind Capacity Factors	21%	31%	28%	21%	28%	27%	23%	29%	28%	24%	28%	27%	28%	32%	31%	23%	27%	26%	22%	27%	26%	22%	28%	27%			
SNSP Limit	50%			50%			50%			50%			55% Trial from Oct			55% Perm from Mar 60% Trial from Nov			60% Perm from Mar 65% Trial from Nov			65% Perm from Apr					

Notes:

"Dispatch Down" consists of constraints, curtailments and wind testing.

The darker shaded cells indicate higher dispatch-down percentages in order to produce a graphical representation similar to a heat map.

A more accurate methodology for calculating wind dispatch down was implemented from 2016. Figures from previous years are best estimates.

Wind installed capacities, generation and capacity factors are indicative and based on the latest available information.

SNSP (System Non-Synchronous Penetration) is the sum of non-synchronous generation (such as wind, solar and HVDC imports) as a percentage of total demand and exports.

When the SNSP limit is raised, a trial period takes place before it becomes permanent. During the trial period, the system is operated at this increased SNSP limit except in times of extreme system events or during system testing.

For more information see annual and quarterly dispatch down reports on : <http://www.eirgridgroup.com/how-the-grid-works/renewables/>

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Regional Wind Dispatch Down Percentages

Region	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2019
NI	9.7%	10.7%	11.8%	10.8%													10.8%
M	4.5%	6.8%	3.9%	5.3%													5.3%
NE	6.1%	5.2%	4.0%	5.0%													5.0%
NW	3.5%	9.6%	14.7%	9.9%													9.9%
SE	4.0%	5.0%	4.7%	4.6%													4.6%
SW	4.1%	8.5%	14.8%	9.3%													9.3%
W	4.1%	6.6%	7.5%	6.3%													6.3%

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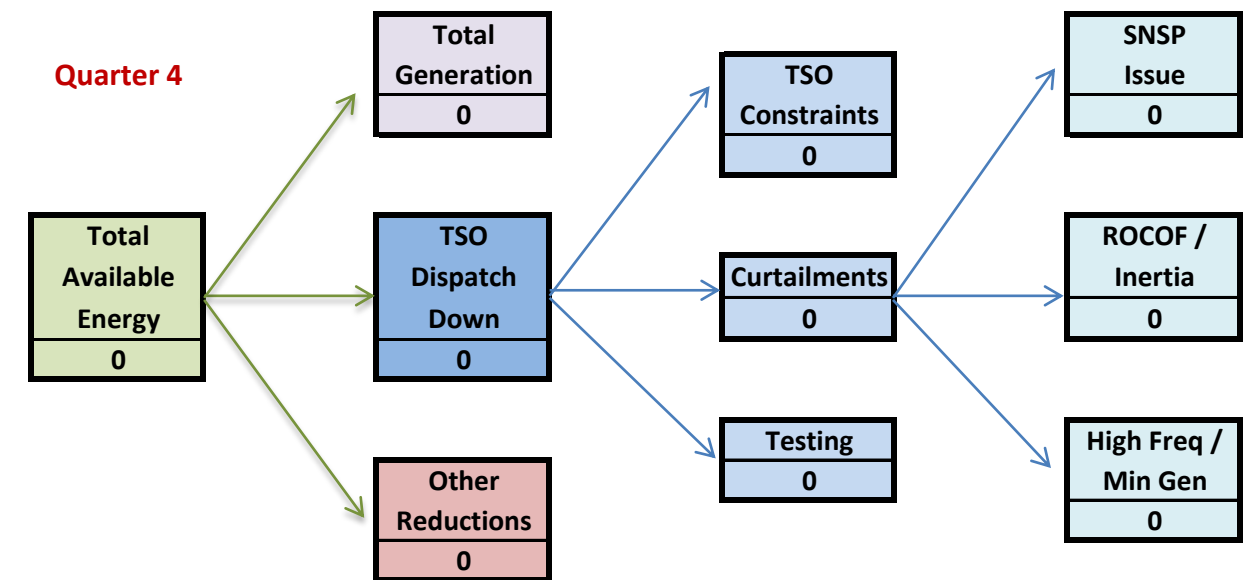
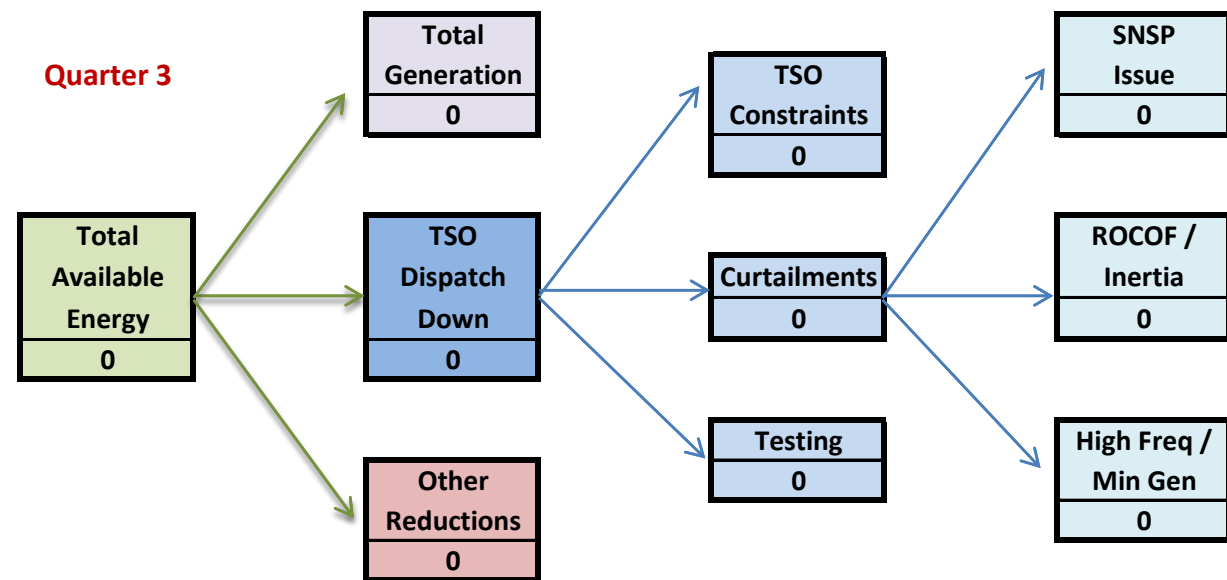
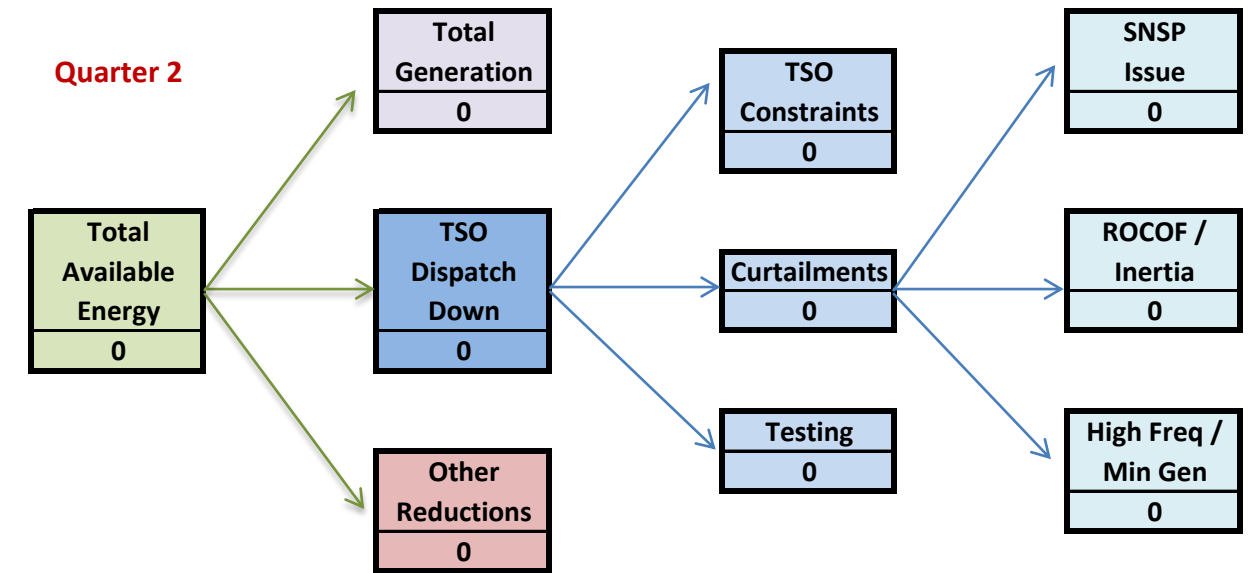
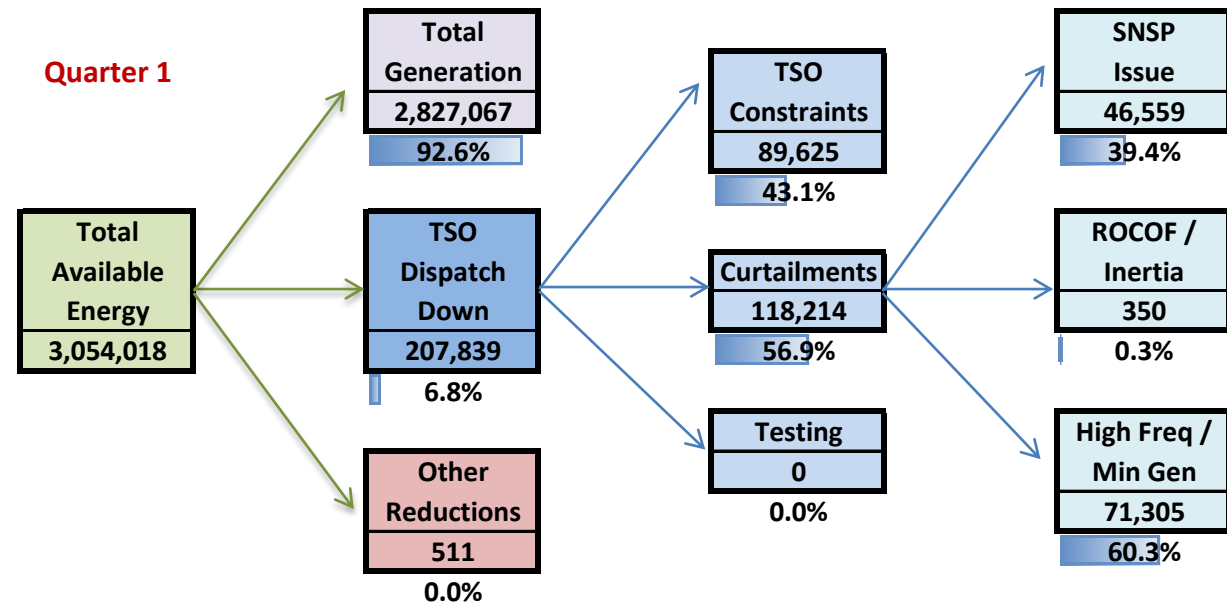
Volumes (MWh)	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2019
Available Energy	801,555	1,213,856	1,038,607	3,054,018	-	-	-	-	-	-	-	-	-	-	-	-	3,054,018
Generation	768,913	1,122,835	935,319	2,827,067	-	-	-	-	-	-	-	-	-	-	-	-	2,827,067
TSO Dispatch Down	30,220	82,547	95,073	207,839	-	-	-	-	-	-	-	-	-	-	-	-	207,839
Other Reductions	98	283	130	511	-	-	-	-	-	-	-	-	-	-	-	-	511
TSO Dispatch Down:																	
TSO Constraints	1,572	23,762	64,291	89,625	-	-	-	-	-	-	-	-	-	-	-	-	89,625
Curtailments	28,648	58,785	30,782	118,214	-	-	-	-	-	-	-	-	-	-	-	-	118,214
TSO Testing	0	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-	0
Curtailments:																	
SNSP Issue	4,287	29,776	12,496	46,559	-	-	-	-	-	-	-	-	-	-	-	-	46,559
ROCOF / Inertia	-	-	350	350	-	-	-	-	-	-	-	-	-	-	-	-	350
High Freq / Min Gen	24,361	29,009	17,936	71,305	-	-	-	-	-	-	-	-	-	-	-	-	71,305

Percentages	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2019
Generation	95.9%	92.5%	90.1%	92.6%													92.6%
TSO Dispatch Down	3.8%	6.8%	9.2%	6.8%													6.8%
Other Reductions	0.0%	0.0%	0.0%	0.0%													0.0%
TSO Dispatch Down:																	
TSO Constraints	5.2%	28.8%	67.6%	43.1%													43.1%
Curtailments	94.8%	71.2%	32.4%	56.9%													56.9%
TSO Testing	0.0%	0.0%	0.0%	0.0%													0.0%
Curtailments:																	
SNSP Issue	15.0%	50.7%	40.6%	39.4%													39.4%
ROCOF / Inertia	0.0%	0.0%	1.1%	0.3%													0.3%
High Freq / Min Gen	85.0%	49.3%	58.3%	60.3%													60.3%

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Graphical Representation of the Breakdown of Wind Dispatch Down Energy Volumes (MWh) and Percentages (%)



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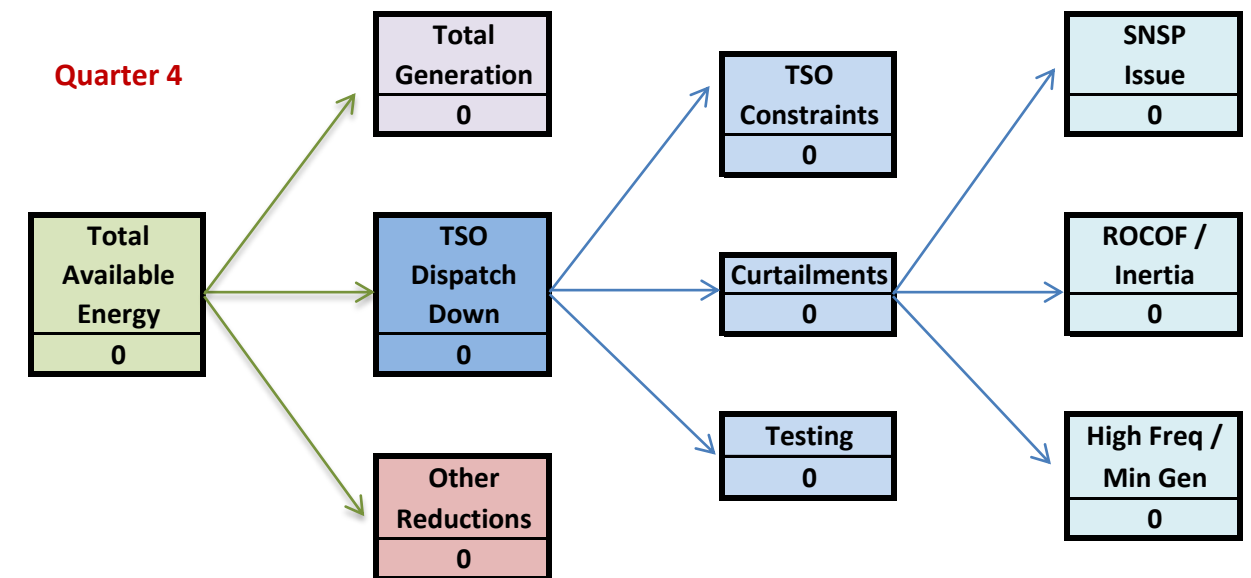
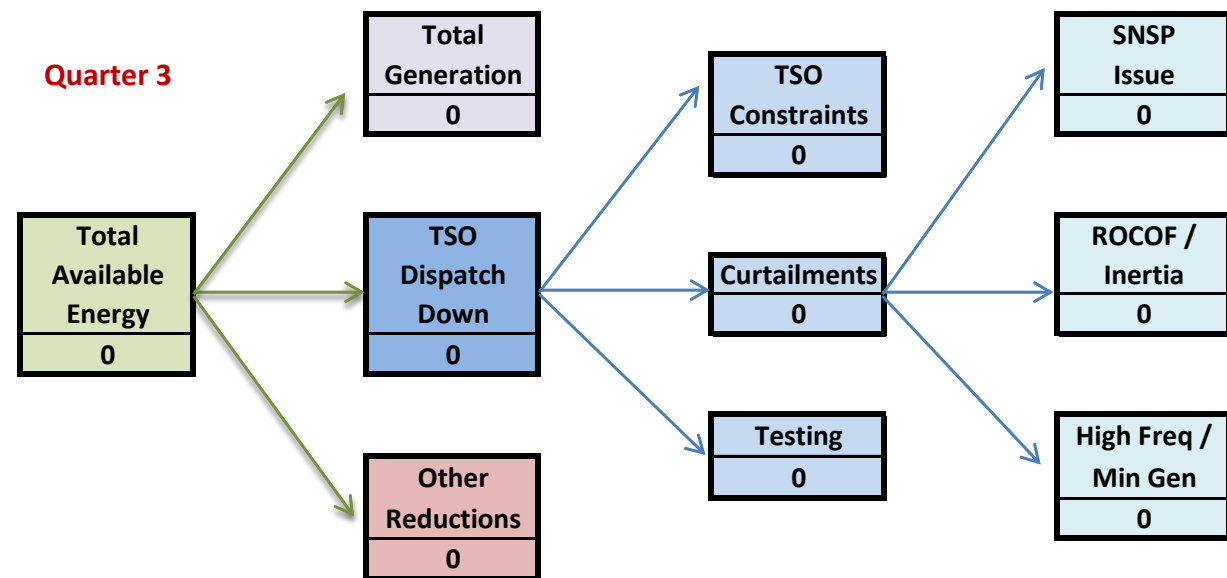
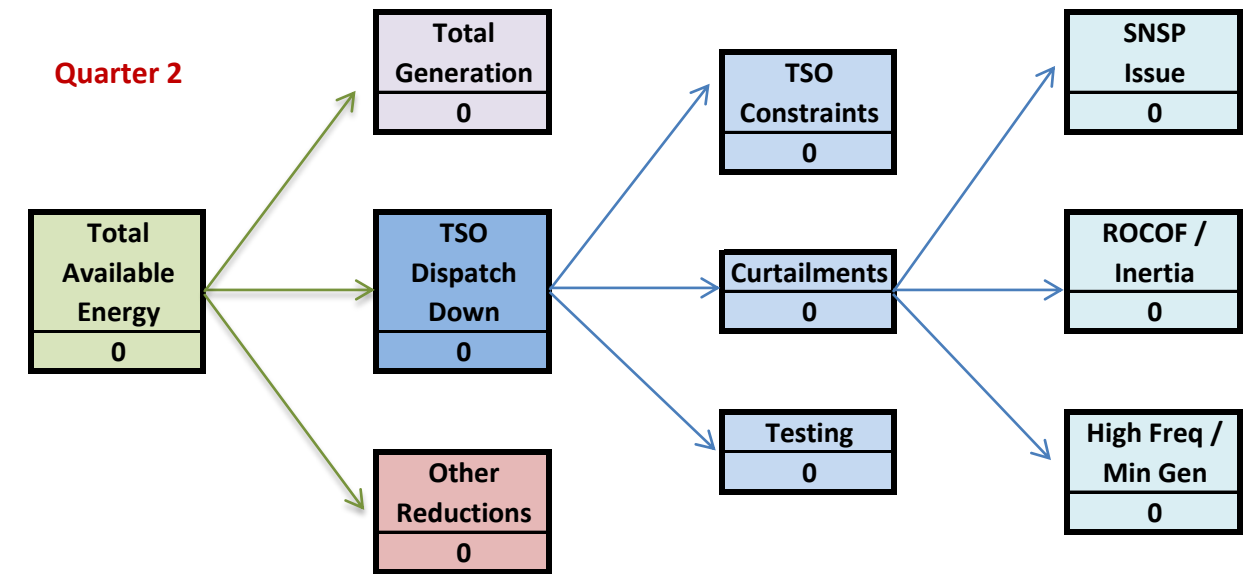
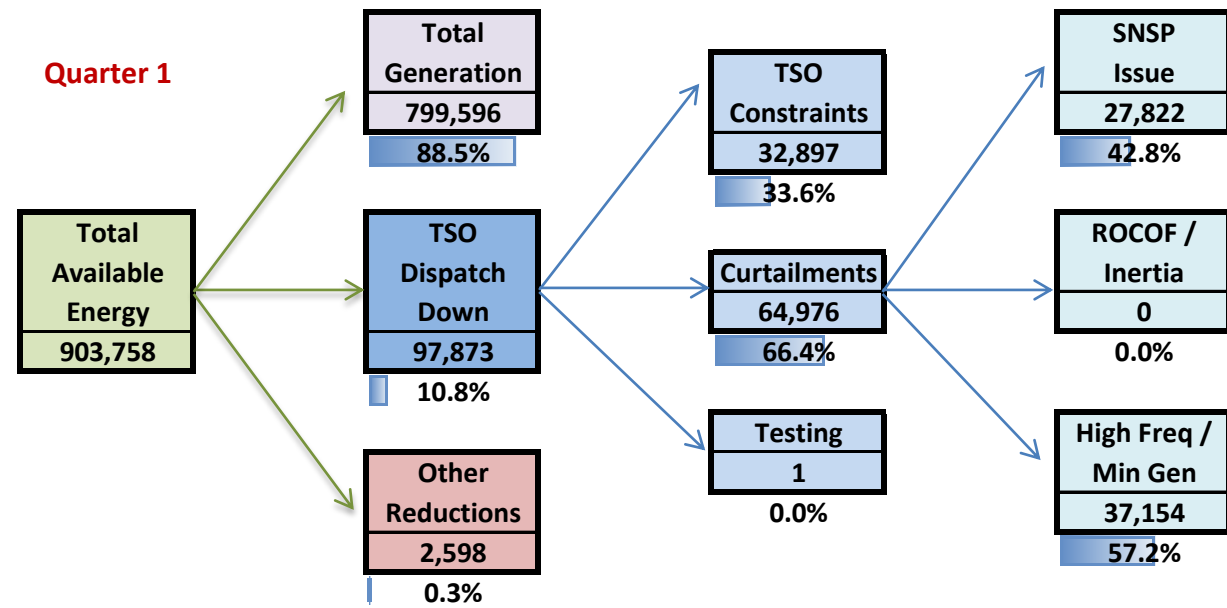
Volumes (MWh)	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2019
Available Energy	234,163	345,183	324,412	903,758	-	-	-	-	-	-	-	-	-	-	-	-	903,758
Generation	210,660	305,449	283,487	799,596	-	-	-	-	-	-	-	-	-	-	-	-	799,596
TSO Dispatch Down	22,598	37,080	38,195	97,873	-	-	-	-	-	-	-	-	-	-	-	-	97,873
Other Reductions	56	1,116	1,426	2,598	-	-	-	-	-	-	-	-	-	-	-	-	2,598
TSO Dispatch Down:																	
TSO Constraints	9,735	6,450	16,712	32,897	-	-	-	-	-	-	-	-	-	-	-	-	32,897
Curtailments	12,863	30,630	21,483	64,976	-	-	-	-	-	-	-	-	-	-	-	-	64,976
TSO Testing	0	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Curtailments:																	
SNSP Issue	3,193	16,906	7,723	27,822	-	-	-	-	-	-	-	-	-	-	-	-	27,822
ROCOF / Inertia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Freq / Min Gen	9,670	13,724	13,760	37,154	-	-	-	-	-	-	-	-	-	-	-	-	37,154

Percentages	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2019
Generation	90.0%	88.5%	87.4%	88.5%													88.5%
TSO Dispatch Down	9.7%	10.7%	11.8%	10.8%													10.8%
Other Reductions	0.0%	0.3%	0.4%	0.3%													0.3%
TSO Dispatch Down:																	
TSO Constraints	43.1%	17.4%	43.8%	33.6%													33.6%
Curtailments	56.9%	82.6%	56.2%	66.4%													66.4%
TSO Testing	0.0%	0.0%	0.0%	0.0%													0.0%
Curtailments:																	
SNSP Issue	24.8%	55.2%	35.9%	42.8%													42.8%
ROCOF / Inertia	0.0%	0.0%	0.0%	0.0%													0.0%
High Freq / Min Gen	75.2%	44.8%	64.1%	57.2%													57.2%

User Guide Available at: <http://www.eirgridgroup.com/how-the-grid-works/renewables/>

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Graphical Representation of the Breakdown of Wind Dispatch Down Energy Volumes (MWh) and Percentages (%)



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