

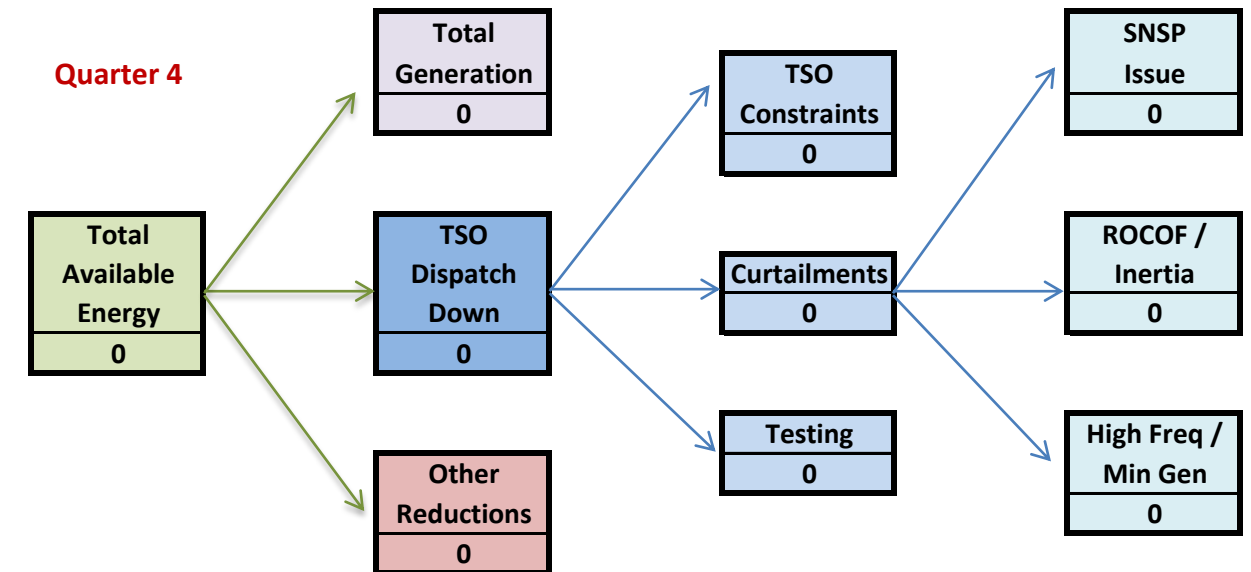
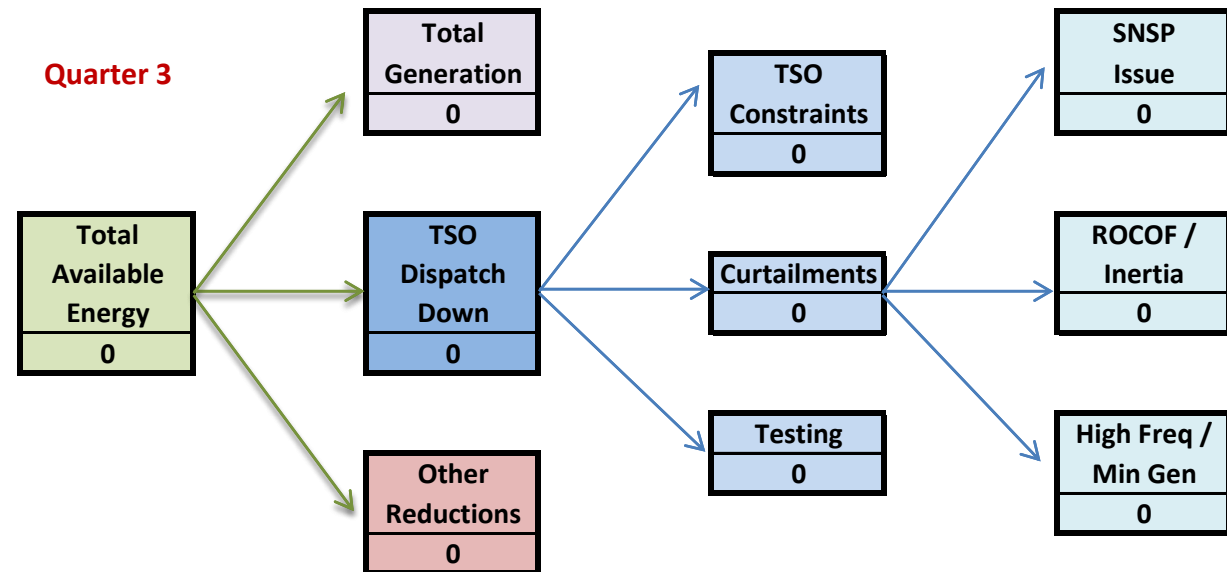
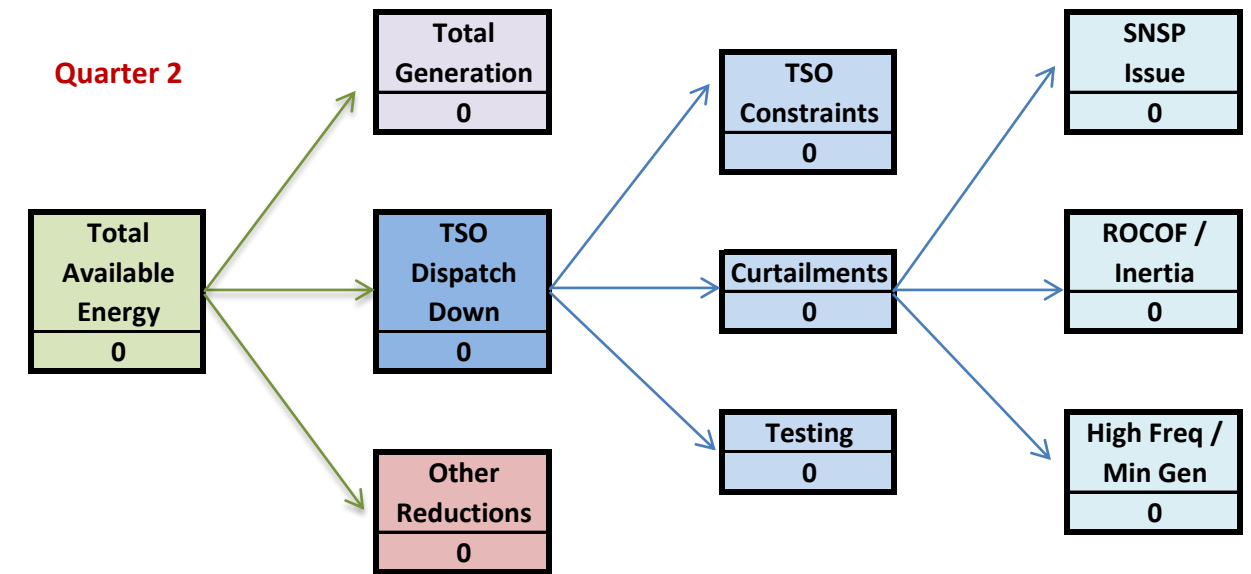
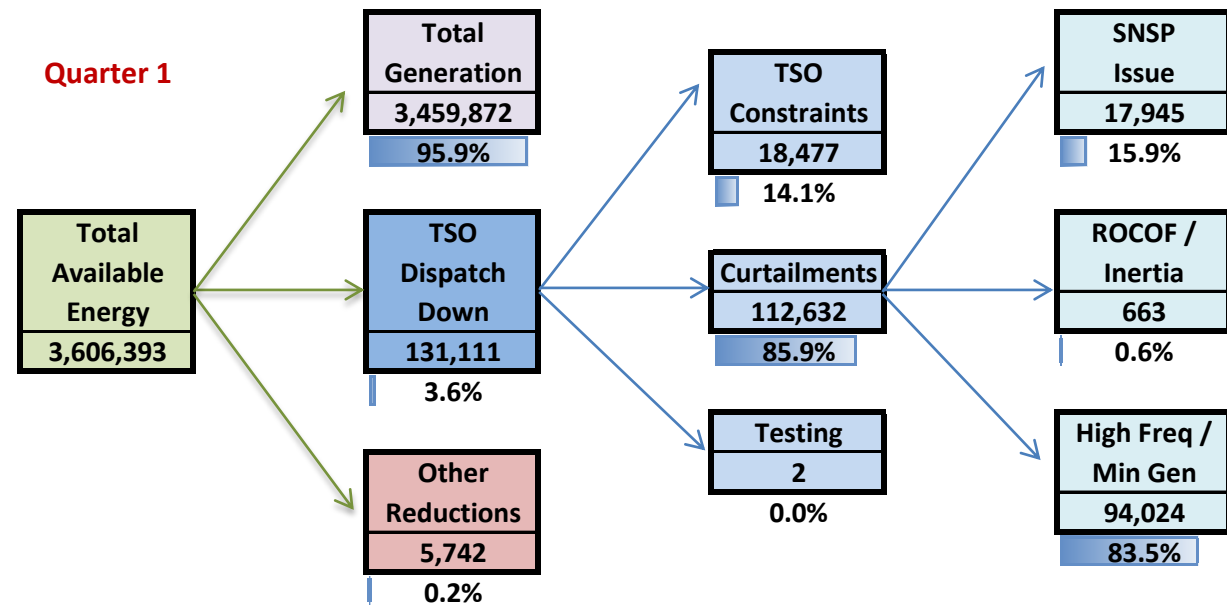
Volumes (MWh)	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2018
Available Energy	1,489,990	1,073,356	1,043,047	3,606,393	-	-	-	-	-	-	-	-	-	-	-	-	3,606,393
Generation	1,423,116	1,046,496	990,259	3,459,872	-	-	-	-	-	-	-	-	-	-	-	-	3,459,872
TSO Dispatch Down	58,403	23,327	49,381	131,111	-	-	-	-	-	-	-	-	-	-	-	-	131,111
Other Reductions	3,960	1,492	290	5,742	-	-	-	-	-	-	-	-	-	-	-	-	5,742
<b>TSO Dispatch Down:</b>																	
TSO Constraints	11,003	3,142	4,332	18,477	-	-	-	-	-	-	-	-	-	-	-	-	18,477
Curtailments	47,398	20,185	45,049	112,632	-	-	-	-	-	-	-	-	-	-	-	-	112,632
TSO Testing	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
<b>Curtailments:</b>																	
SNSP Issue	8,378	2,161	7,406	17,945	-	-	-	-	-	-	-	-	-	-	-	-	17,945
ROCOF / Inertia	1	550	112	663	-	-	-	-	-	-	-	-	-	-	-	-	663
High Freq / Min Gen	39,019	17,474	37,531	94,024	-	-	-	-	-	-	-	-	-	-	-	-	94,024

Percentages	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2018
Generation	95.5%	97.5%	94.9%	95.9%													95.9%
TSO Dispatch Down	3.9%	2.2%	4.7%	3.6%													3.6%
Other Reductions	0.3%	0.1%	0.0%	0.2%													0.2%
<b>TSO Dispatch Down:</b>																	
TSO Constraints	18.8%	13.5%	8.8%	14.1%													14.1%
Curtailments	81.2%	86.5%	91.2%	85.9%													85.9%
TSO Testing	0.0%	0.0%	0.0%	0.0%													0.0%
<b>Curtailments:</b>																	
SNSP Issue	17.7%	10.7%	16.4%	15.9%													15.9%
ROCOF / Inertia	0.0%	2.7%	0.2%	0.6%													0.6%
High Freq / Min Gen	82.3%	86.6%	83.3%	83.5%													83.5%

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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		
	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%
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%
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%
<b>Qtr1</b>	<b>0.7%</b>	<b>1.0%</b>	<b>0.9%</b>	<b>0.5%</b>	<b>2.4%</b>	<b>2.0%</b>	<b>0.6%</b>	<b>0.4%</b>	<b>0.5%</b>	<b>2.7%</b>	<b>4.2%</b>	<b>3.9%</b>	<b>6.9%</b>	<b>5.4%</b>	<b>5.8%</b>	<b>2.4%</b>	<b>3.2%</b>	<b>3.0%</b>	<b>2.4%</b>	<b>2.3%</b>	<b>2.4%</b>	<b>4.9%</b>	<b>3.3%</b>	<b>3.6%</b>
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%			
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%			
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%			
<b>Qtr2</b>	<b>1.6%</b>	<b>2.3%</b>	<b>2.2%</b>	<b>0.4%</b>	<b>2.2%</b>	<b>1.9%</b>	<b>2.9%</b>	<b>5.0%</b>	<b>4.6%</b>	<b>1.5%</b>	<b>3.4%</b>	<b>3.0%</b>	<b>3.7%</b>	<b>3.9%</b>	<b>3.8%</b>	<b>0.8%</b>	<b>1.2%</b>	<b>1.1%</b>	<b>4.2%</b>	<b>3.7%</b>	<b>3.8%</b>			
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%			
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%			
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%			
<b>Qtr3</b>	<b>1.5%</b>	<b>3.1%</b>	<b>2.8%</b>	<b>1.5%</b>	<b>3.8%</b>	<b>3.3%</b>	<b>1.3%</b>	<b>4.6%</b>	<b>3.9%</b>	<b>2.4%</b>	<b>3.3%</b>	<b>3.1%</b>	<b>3.1%</b>	<b>4.1%</b>	<b>3.9%</b>	<b>6.3%</b>	<b>4.4%</b>	<b>4.8%</b>	<b>3.9%</b>	<b>3.9%</b>	<b>3.9%</b>			
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%			
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%			
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%			
<b>Qtr4</b>	<b>1.4%</b>	<b>2.9%</b>	<b>2.6%</b>	<b>0.4%</b>	<b>1.6%</b>	<b>1.4%</b>	<b>2.4%</b>	<b>4.5%</b>	<b>4.0%</b>	<b>3.9%</b>	<b>5.7%</b>	<b>5.3%</b>	<b>6.1%</b>	<b>6.0%</b>	<b>6.0%</b>	<b>3.0%</b>	<b>2.1%</b>	<b>2.3%</b>	<b>8.5%</b>	<b>4.9%</b>	<b>5.7%</b>			
<b>Year Total</b>	<b>1.3%</b>	<b>2.4%</b>	<b>2.2%</b>	<b>0.7%</b>	<b>2.5%</b>	<b>2.1%</b>	<b>1.9%</b>	<b>3.5%</b>	<b>3.2%</b>	<b>2.8%</b>	<b>4.4%</b>	<b>4.1%</b>	<b>5.3%</b>	<b>5.1%</b>	<b>5.1%</b>	<b>3.2%</b>	<b>2.8%</b>	<b>2.9%</b>	<b>5.0%</b>	<b>3.7%</b>	<b>4.0%</b>	<b>4.9%</b>	<b>3.3%</b>	<b>3.6%</b>
<b>Wind Installed Capacity (MW)</b>	515	1,585	2,100	603	1,703	2,306	644	2,008	2,652	733	2,279	3,013	755	2,447	3,203	948	2,779	3,727	1,160	3,311	4,471			
<b>Wind Generation (GWh)</b>	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			
<b>Wind Capacity Factors</b>	21%	31%	28%	21%	28%	27%	23%	29%	27%	24%	27%	26%	28%	32%	31%	23%	27%	26%	22%	27%	26%			
<b>SNSP Limit</b>	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 TSO 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.

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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	2018
NI	5.7%	2.9%	5.9%	4.9%													4.9%
M	5.5%	3.1%	5.6%	4.8%													4.8%
NE	2.3%	2.4%	5.3%	3.2%													3.2%
NW	5.7%	2.3%	6.4%	4.9%													4.9%
SE	4.2%	2.9%	5.3%	4.1%													4.1%
SW	3.2%	1.9%	4.3%	3.1%													3.1%
W	3.2%	1.9%	4.8%	3.3%													3.3%

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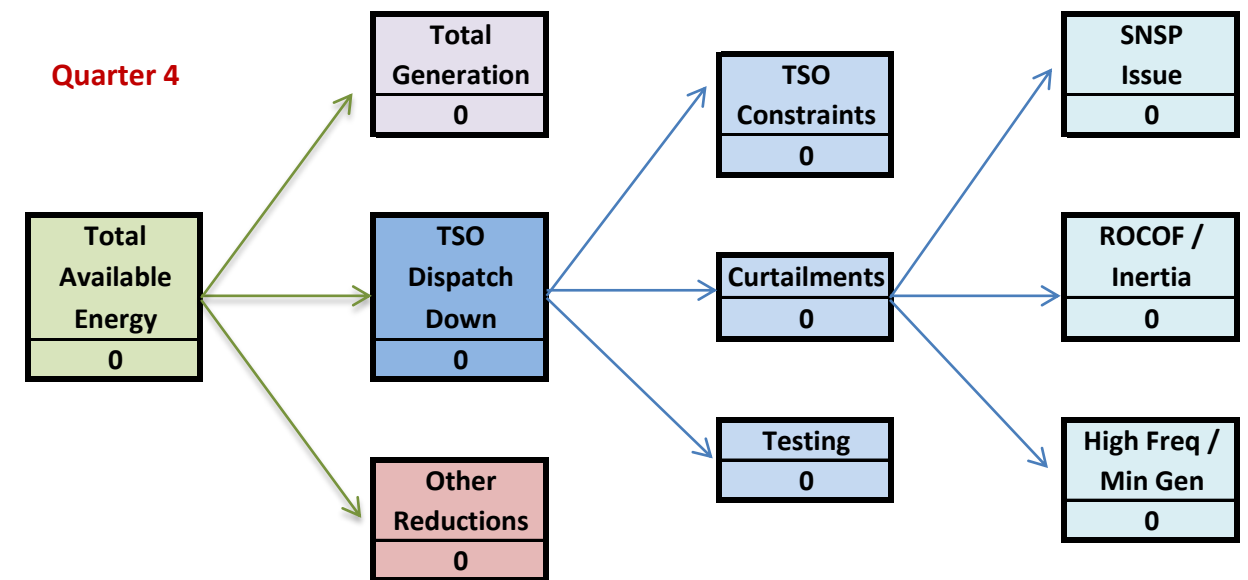
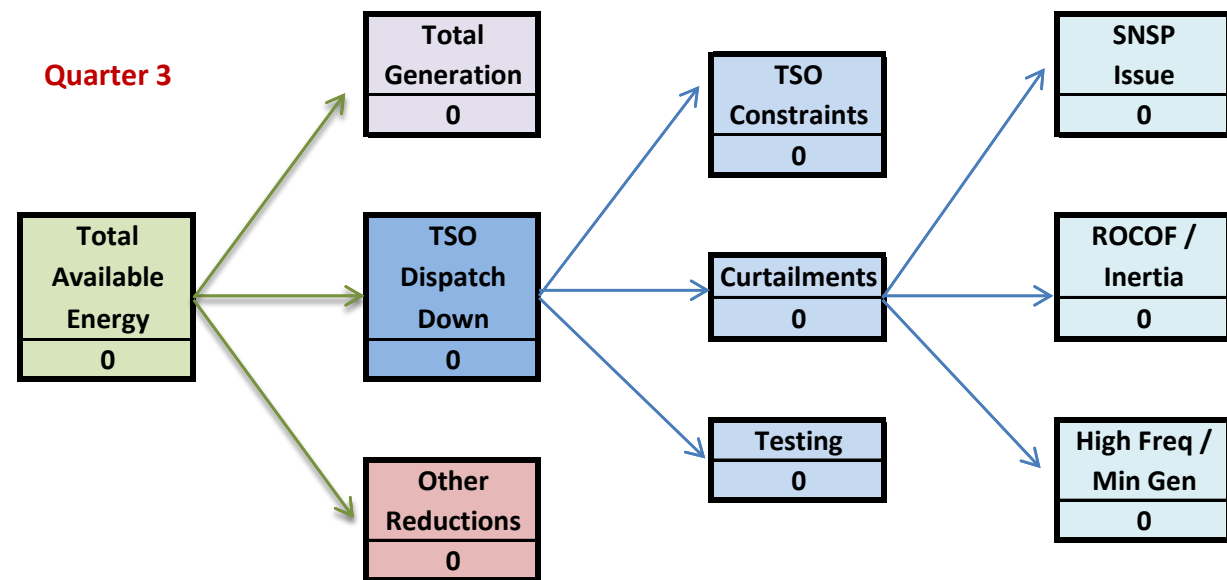
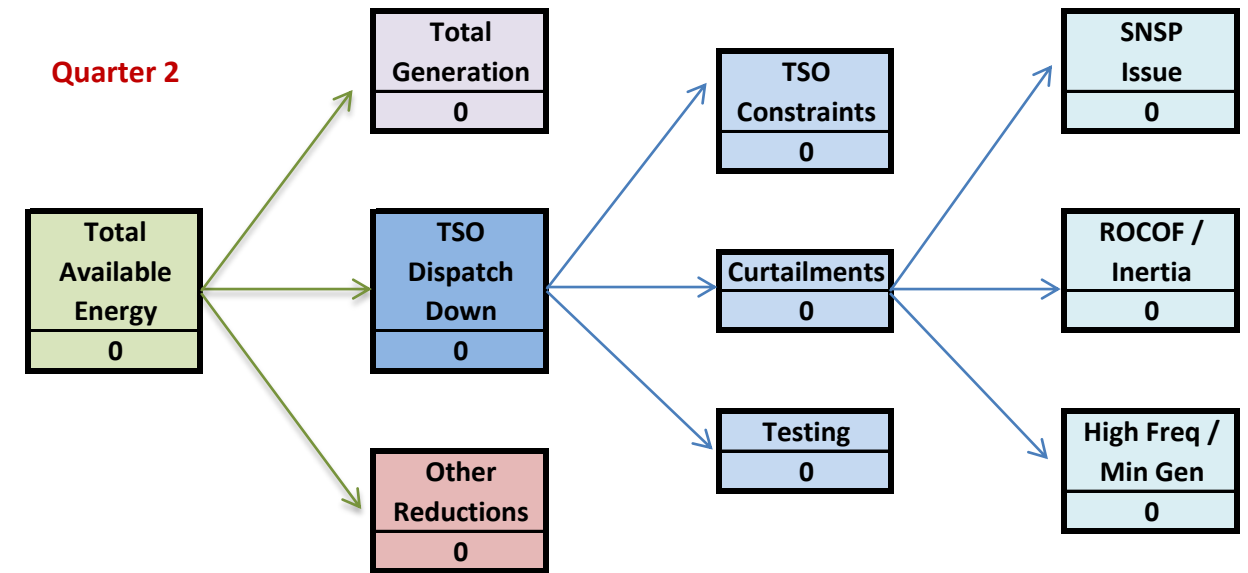
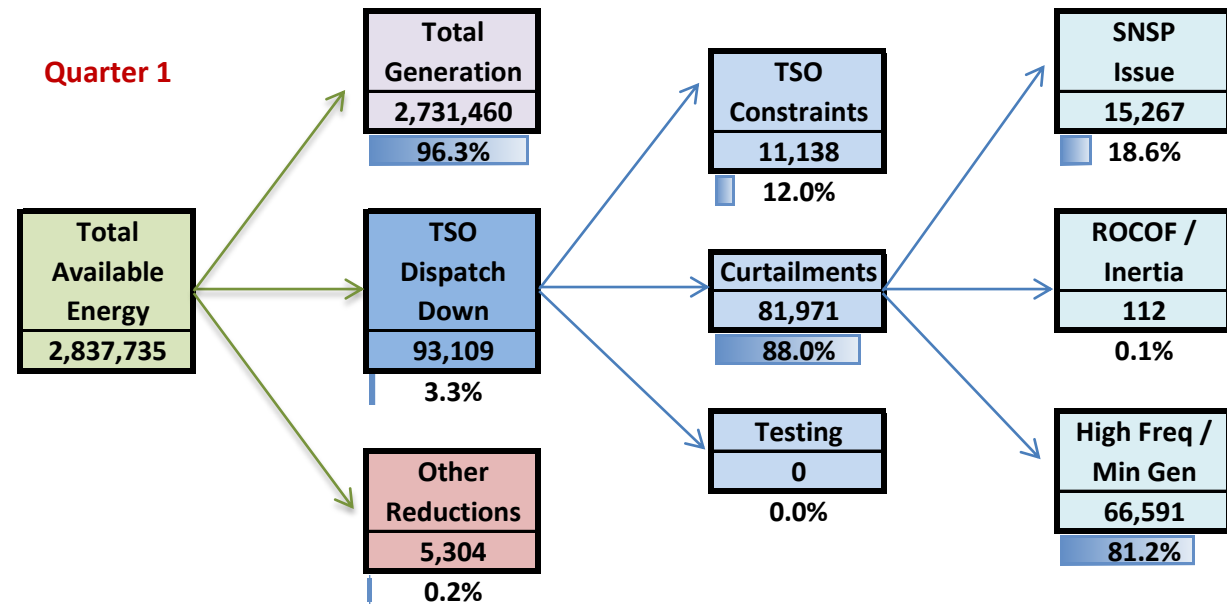
Volumes (MWh)	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2018
Available Energy	1,175,274	854,216	808,245	2,837,735	-	-	-	-	-	-	-	-	-	-	-	-	2,837,735
Generation	1,127,424	834,092	769,944	2,731,460	-	-	-	-	-	-	-	-	-	-	-	-	2,731,460
TSO Dispatch Down	40,619	16,989	35,500	93,109	-	-	-	-	-	-	-	-	-	-	-	-	93,109
Other Reductions	3,606	1,450	249	5,304	-	-	-	-	-	-	-	-	-	-	-	-	5,304
<b>TSO Dispatch Down:</b>																	
TSO Constraints	8,274	1,328	1,536	11,138	-	-	-	-	-	-	-	-	-	-	-	-	11,138
Curtailments	32,345	15,661	33,964	81,971	-	-	-	-	-	-	-	-	-	-	-	-	81,971
TSO Testing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Curtailments:</b>																	
SNSP Issue	6,531	1,476	7,260	15,267	-	-	-	-	-	-	-	-	-	-	-	-	15,267
ROCOF / Inertia	-	-	112	112	-	-	-	-	-	-	-	-	-	-	-	-	112
High Freq / Min Gen	25,815	14,185	26,591	66,591	-	-	-	-	-	-	-	-	-	-	-	-	66,591

Percentages	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2018
Generation	95.9%	97.6%	95.3%	96.3%													96.3%
TSO Dispatch Down	3.5%	2.0%	4.4%	3.3%													3.3%
Other Reductions	0.3%	0.2%	0.0%	0.2%													0.2%
<b>TSO Dispatch Down:</b>																	
TSO Constraints	20.4%	7.8%	4.3%	12.0%													12.0%
Curtailments	79.6%	92.2%	95.7%	88.0%													88.0%
TSO Testing	0.0%	0.0%	0.0%	0.0%													0.0%
<b>Curtailments:</b>																	
SNSP Issue	20.2%	9.4%	21.4%	18.6%													18.6%
ROCOF / Inertia	0.0%	0.0%	0.3%	0.1%													0.1%
High Freq / Min Gen	79.8%	90.6%	78.3%	81.2%													81.2%

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



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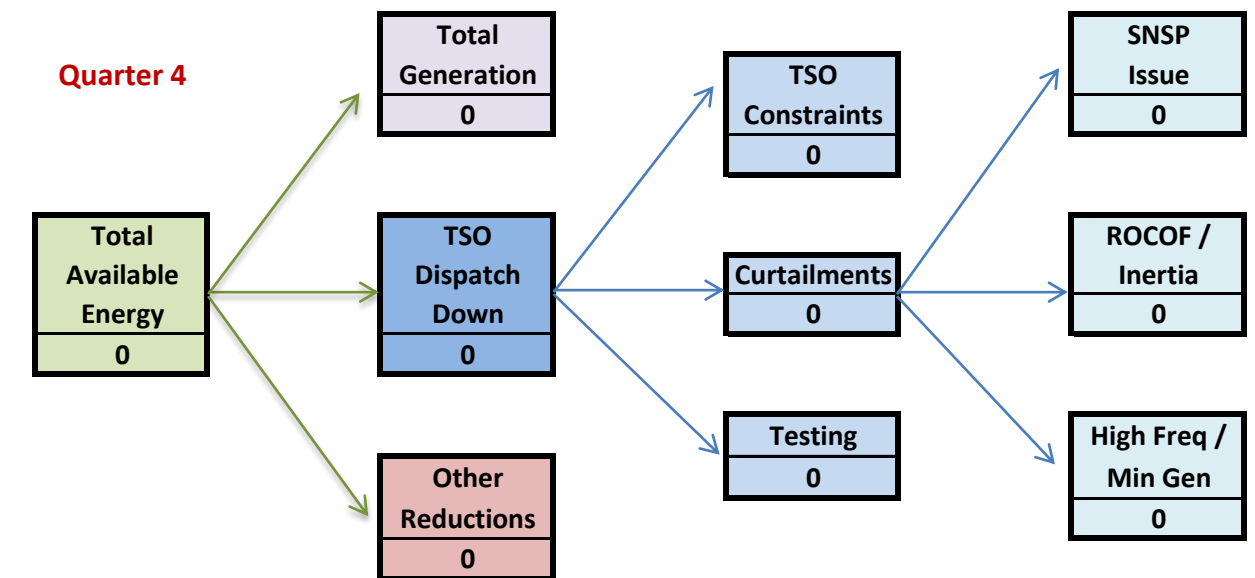
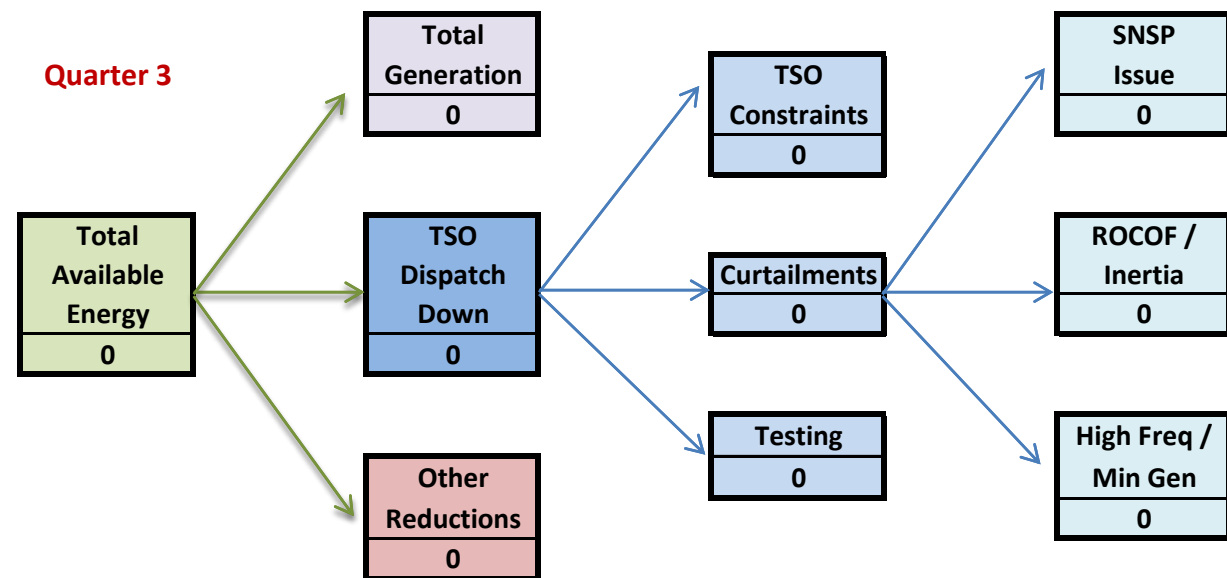
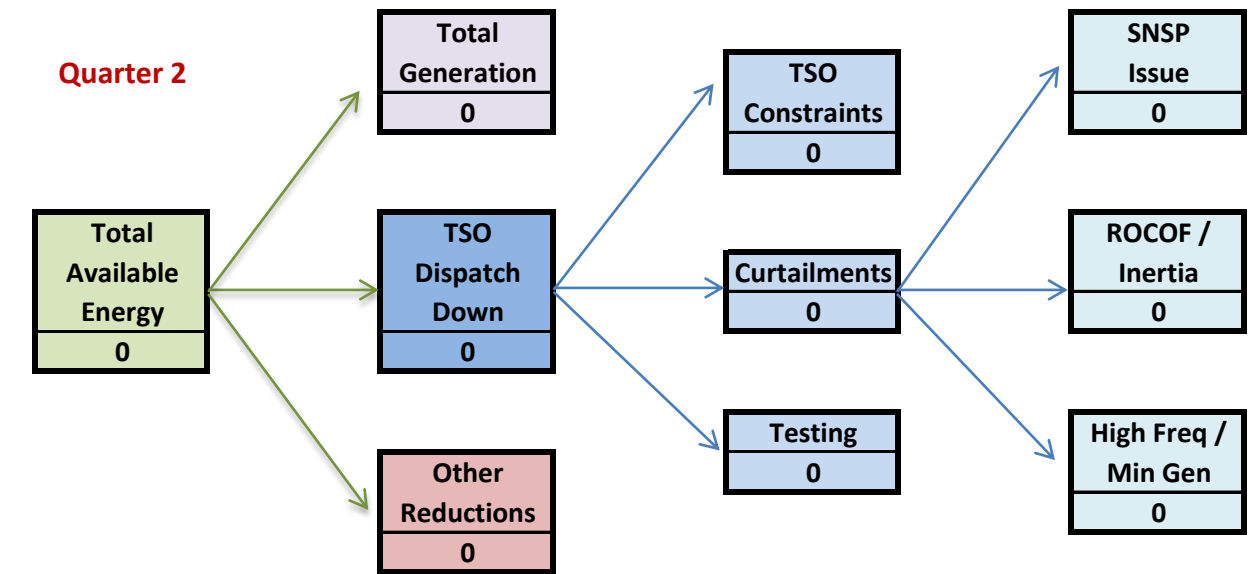
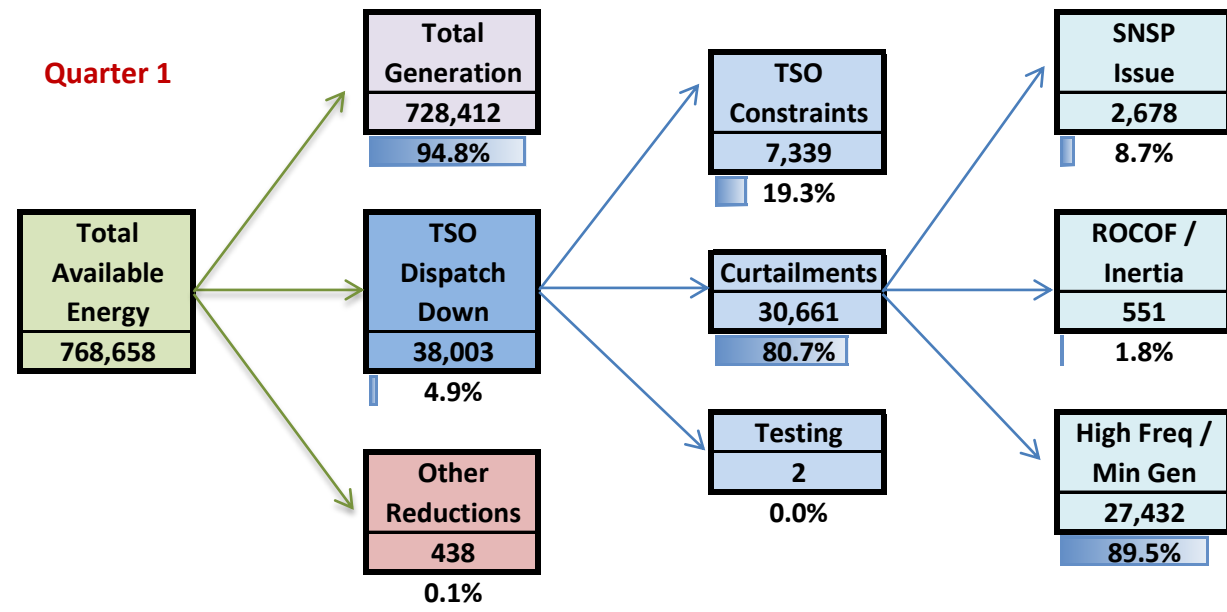
Volumes (MWh)	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2018
Available Energy	314,716	219,140	234,802	768,658	-	-	-	-	-	-	-	-	-	-	-	-	768,658
Generation	295,693	212,404	220,315	728,412	-	-	-	-	-	-	-	-	-	-	-	-	728,412
TSO Dispatch Down	17,784	6,338	13,881	38,003	-	-	-	-	-	-	-	-	-	-	-	-	38,003
Other Reductions	354	43	41	438	-	-	-	-	-	-	-	-	-	-	-	-	438
<b>TSO Dispatch Down:</b>																	
TSO Constraints	2,729	1,814	2,796	7,339	-	-	-	-	-	-	-	-	-	-	-	-	7,339
Curtailments	15,053	4,523	11,085	30,661	-	-	-	-	-	-	-	-	-	-	-	-	30,661
TSO Testing	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
<b>Curtailments:</b>																	
SNSP Issue	1,848	685	145	2,678	-	-	-	-	-	-	-	-	-	-	-	-	2,678
ROCOF / Inertia	1	550	-	551	-	-	-	-	-	-	-	-	-	-	-	-	551
High Freq / Min Gen	13,204	3,289	10,940	27,432	-	-	-	-	-	-	-	-	-	-	-	-	27,432

Percentages	Jan	Feb	Mar	Qtr1	Apr	May	Jun	Qtr2	Jul	Aug	Sep	Qtr3	Oct	Nov	Dec	Qtr4	2018
Generation	94.0%	96.9%	93.8%	94.8%													94.8%
TSO Dispatch Down	5.7%	2.9%	5.9%	4.9%													4.9%
Other Reductions	0.1%	0.0%	0.0%	0.1%													0.1%
<b>TSO Dispatch Down:</b>																	
TSO Constraints	15.3%	28.6%	20.1%	19.3%													19.3%
Curtailments	84.6%	71.4%	79.9%	80.7%													80.7%
TSO Testing	0.0%	0.0%	0.0%	0.0%													0.0%
<b>Curtailments:</b>																	
SNSP Issue	12.3%	15.1%	1.3%	8.7%													8.7%
ROCOF / Inertia	0.0%	12.2%	0.0%	1.8%													1.8%
High Freq / Min Gen	87.7%	72.7%	98.7%	89.5%													89.5%

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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