

P229 Assessment Report Appendix - CBA approximate Seasonal Zonal TLMs

This document presents Seasonal Zonal Transmission Loss Multipliers (TLMs) to aid consideration of Modification P229. The TLMs have been calculated using data from the P229 Cost-Benefit Analysis (CBA) modelling exercise, i.e. offtaking (demand) and delivering (generating) energy volumes for each TLF Zone and Seasonal Zonal Transmission Loss Factors. Offtake relates to Supplier activities and delivery relates to Generators.

The TLMs calculated using this data are approximations that can be applied to BM Units on a Seasonal and Zonal basis. They are not true TLMs, as there is only one delivering TLM value and one offtaking TLM value per TLF Zone per BSC Season. The intention is that by considering the Metered Volume of energy that a given BM Unit might produce in a given Season, participants can calculate what adjustment might be made to that Metered Volume under the baseline (i.e. without P229) and under arrangements including the P229 Proposed solution or Alternative solution. This can be done by identifying the appropriate TLF Zone and relevant BSC Season(s) and applying the associated TLM value from the tables below.

An example is provided below, but please note that before using these TLMs it is advisable that you consider the explanatory note below to understand the limitations of these TLM values and how you should consider the results of any calculations carried out using these TLMs.

Explanatory note

These approximate Seasonal Zonal TLMs have been calculated using data from the P229 CBA modelling exercise and a modified application of the TLM calculation in Section T of the Code. As such they must be considered only as indicative values.

ELEXON believes that it would be prudent when considering the results of any calculations made using these TLMs to consider the relative values produced, and not the absolute values which cannot be expected to accurately represent actual future values given the assumptions and approximations necessarily applied in the modelling.

So for instance we advise that you should not solely calculate and consider in isolation an energy volume adjustment using TLMs associated with the P229 Proposed solution (the 'Reference Case'). It would be more informative to also calculate volume adjustments using corresponding TLMs associated with the Base Case (i.e. modelled without P229) and then to consider the difference between the two adjustment values (or sets of values).

Example calculations

The following information is needed to calculate the effect on the metered volumes of any given Supplier or Generator in a BSC Season within the P229 CBA analysis period:

- The volume of power contracted to supply or generate;
- The TLF Zone in which the Supplier or Generator operates;
- The BSC Season and year combination; and

- The approximate offtaking (Supply) or delivering (Generation) Seasonal Zonal TLM (from the tables in this document).

1. Offtaking volumes

Consider the example of a Supplier with a contract to supply 1000 units of power to a customer in GSP Group C in Spring 2014. In order to determine the approximate effect of P229 it is necessary to map the GSP Group to the TLF Zone that is (see GSP Group to TLF Zone key on page 5) and then look up the relevant TLM value from the appropriate table. GSP Group C equates to TLF Zone 3.

a) TLM calculation: Baseline case

The TLMs relating to offtaking volumes under the baseline can be found in the Table 2 'Offtaking TLMs: Base Case' (page 10). The approximate offtaking Seasonal Zonal TLM for TLF Zone 3 in Spring 2014 is 1.0065. The excerpt below, from Table 2, illustrates how this value is found.

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
2013	Winter	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084
2014	Spring	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065
2014	Summer	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055

The TLM is applied to the metered volume to adjust it to a value that reflects the losses on the Transmission System. Offtaking TLMs under the baseline are always greater than one and therefore scale up Supplier's offtake from the Transmission system (effectively 'debiting' energy from them).

TLMs are used to adjust Parties' actual volumes to determine the volumes used in Settlement as follows:

$$(\text{'Actual' energy volume}) \times (\text{TLM}) = (\text{Adjusted Settlement volume})$$

Therefore, in order to determine the amount of energy the Supplier in this example would actually need to provide to fulfil its contract to Supply 1000 units, the TLM of 1.0065 would be applied as follows:

$$(-1000 \text{ units}) \times 1.0065 = -1006.5 \text{ units}$$

This means that to take account of the loss adjustment the Supplier would need to ensure it provided an additional 6.5 units (i.e. $(-1006.5) - (-1000) = -6.5$) above its contracted volume to compensate for Transmission Losses¹. Note the energy volumes are negative because they represent volumes offtaken from the system.

b) TLM calculation: Proposed change case

The TLMs relating to offtaking volumes under P229 Proposed can be found in the Table 4 'Offtaking TLMs: Proposed Modification' (page 16). The approximate offtaking Seasonal Zonal TLM for TLF Zone 3 in Spring 2014 is 1.0208 (no illustrative example is provided). Therefore the amount of energy the Supplier would need to provide to fulfil its contract to supply 1000 units, given the TLM of 1.0208, would be:

$$(-1000 \text{ units}) \times 1.0208 = -1020.8 \text{ units}$$

¹ Supplier would also need to provide additional units for Distribution losses, but P229 does not change the arrangements for these.

This means that to take account of the loss adjustment the Supplier would need to ensure it provided an additional 20.8 units (i.e. $(-1020.8) - (-1000) = -20.8$) above its contracted volume to compensate for Transmission Losses.

c) TLM calculation: Alternative change case

To assess the impact of the Alternative, the calculation should be carried out using values from the table of offtaking TLMs for the Alternative Modification.

d) Comparing adjusted volumes

As explained above it, is unlikely that the approximate Seasonal Zonal TLMs, and therefore resultant energy volumes, will be absolutely accurate as a representation of Transmission Losses adjustments in the future under either the baseline or P229. ELEXON believes that it may therefore be more informative to consider the difference between values calculated using different TLMs (e.g. for baseline and P229 Proposed) for the same combination of Supplier, TLF Zone, energy volume and BSC Season/year combination.

The rationale for this is that while the modelled base and change cases are, necessarily, subject to assumptions and approximations in the modelling process, they are both subject to the same assumptions and approximations. Therefore, while each modelled case in isolation cannot be considered absolutely representative, it is plausible that the difference between modelled cases may be reasonably representative of the future impact of one modelled case compared with another.

For instance, comparing results generated by the baseline TLMs and P229 Proposed TLMs will give an indication of the impact of implementing P229 Proposed, i.e. compared with retention of the baseline. Therefore, using the example results above for the same Supplier, the impact of P229 Proposed compared with the baseline would be as follows:

$$\begin{aligned}\text{P229 Proposed impact} &= (\text{P229 Proposed result}) - (\text{Baseline result}) \\ &= (-20.8) - (-6.5) \\ &= -14.3 \text{ units}\end{aligned}$$

This means that in this example, under the stated conditions, the Supplier's adjusted energy volume under P229 Proposed would differ from that under the baseline by -14.3 units. In this particular instance the Supplier would therefore be 'worse off' by 14.3 units. Again, this should be considered as an indicative assessment only. Note that impact will vary with activity (delivery or offtake) and location (i.e. TLF Zone); not all offtaking Parties would be disadvantaged in the same manner as the Supplier in this example.

Similarly results from the Alternative TLMs may be compared with baseline and P229 Proposed results to gauge the relative impacts.

2. Delivering volumes

This example is a reversal of the Supplier example above. Consider a Generator which actually generates 1000 units in GSP Group C (i.e. TLF Zone 3) in Spring 2014. Again, to determine the approximate effect of P229 it is necessary to map the GSP Group to the TLF Zone using the GSP Group to TLF Zone key (page 5) and then look up the relevant TLM value from the appropriate table.

TLMs are applied in the same manner as in the above offtaking example, but delivering TLMs are always less than one under the baseline and therefore scale down Generators' delivery to the Transmission system (which effectively 'debits' energy from them).

a) TLM calculation: Baseline case

The TLMs relating to offtaking volumes under the baseline can be found in the Table 1 'Delivering TLMs: Base Case' (page 7). The approximate offtaking Seasonal Zonal TLM for TLF Zone 3 in Spring 2014 is 0.9948. The excerpt below, from Table 1, illustrates how this value is found.

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
2013	Winter	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933
2014	Spring	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948
2014	Summer	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955

The output of the example Generator must be multiplied by the TLM value to determine the adjusted volume it is considered to have delivered for the purposes of Settlement. Therefore, in order to determine the amount of energy the Generator is considered to have delivered for Settlement purposes by physically generating 1000 units, the TLM of 0.9948 would be applied as follows:

$$(\text{'Actual' energy volume}) \times (\text{TLM}) = (\text{Adjusted Settlement volume})$$

$$1000 \text{ units} \times 0.9948 = 994.8 \text{ units}$$

This means that to take account of the loss adjustment the Supplier would need to ensure it provided an additional 5.2 units (i.e. $1000 - 994.8 = 5.2$) above its contracted volume to compensate for Transmission Losses. Note the energy volumes are positive because they represent volumes delivered to the system.

b) TLM calculation: Proposed change case

The TLMs relating to delivering volumes under P229 Proposed can be found in the Table 3 'Delivering TLMs: Proposed Modification' (page 13). The approximate delivering Seasonal Zonal TLM for TLF Zone 3 in Spring 2014 is 1.0125. Therefore the amount of energy the Generator would need to provide to fulfil its contract to generate 1000 units, given the TLM of 1.0125, would be:

$$1000 \text{ units} \times 1.0125 = 1012.5 \text{ units}$$

The loss adjustment means the Generator's output is scaled up for the purposes of Settlement; they would be credited with 12.3 units (i.e. $1000 - 1012.5 = -12.5$) above its physical volume as a result of the application of TLM to compensate for Transmission Losses.

c) TLM calculation: Alternative change case

To assess the impact of the Alternative, repeat the calculation using values from the appropriate table of TLMs for the Alternative Modification.

d) Comparing adjusted volumes

The rationale detailed in 1 d) above for Suppliers applies to comparisons between results for Generators.

$$\begin{aligned} \text{P229 Proposed impact} &= (\text{P229 Proposed result}) - (\text{Baseline result}) \\ &= (-12.5) - (5.2) \\ &= -17.7 \text{ units} \end{aligned}$$

So under the stated conditions the Generator's adjusted energy volume under P229 Proposed would differ from that under the baseline by -17.7 units. In this particular instance the Generator would therefore be 'better off' by 17.7 units. Again, this should be considered as an indicative assessment only and impact varies with activity (delivery or offtake) and location (i.e. TLF Zone); not all delivering Parties would benefit in the same manner as the Generator in this example.

Similarly results from the Alternative TLMs may be compared with baseline and P229 Proposed results to gauge the relative impacts.

GSP Group to TLF Zone key

TLF Zone	GSP Group	GSP Group Name
1	A	Eastern
2	B	East Midlands
3	C	LE Distribution
4	D	Merseyside & North Wales
5	E	Midlands
6	F	Northern
7	G	North Western
8	H	Southern
9	J	South Eastern
10	K	South Wales
11	L	South Western
12	M	Yorkshire Electricity
13	N	South of Scotland
14	P	North of Scotland

BSC Seasons

- BSC Year: 1 April – 31 March
- BSC Spring: 1 March – 31 May
- BSC Summer: 1 June – 31 August
- BSC Autumn: 1 September – 30 November
- BSC Winter: 1 December – 28/29 February

Contents:

1	Delivering TLMs: Base Case (no P229 i.e. TLFs = 0)	7
2	Offtaking TLMs: Base Case (no P229 i.e. TLFs = 0)	10
3	Delivering TLMs: Proposed Modification	13
4	Offtaking TLMs: Proposed Modification	16
5	Delivering TLMs: Alternative Modification	19
6	Offtaking TLMs: Alternative Modification.....	22

1 Delivering TLMs: Base Case (no P229 i.e. TLFs = 0)

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2012	Spring	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942
2012	Summer	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940
2012	Autumn	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936
2012	Winter	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933
2013	Spring	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946
2013	Summer	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951
2013	Autumn	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940
2013	Winter	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933
2014	Spring	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948
2014	Summer	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955	0.9955
2014	Autumn	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941
2014	Winter	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932
2015	Spring	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950
2015	Summer	0.9957	0.9957	0.9957	0.9957	0.9957	0.9957	0.9957	0.9957	0.9957	0.9957	0.9957	0.9957	0.9957	0.9957

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2015	Autumn	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942	0.9942
2015	Winter	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936	0.9936
2016	Spring	0.9952	0.9952	0.9952	0.9952	0.9952	0.9952	0.9952	0.9952	0.9952	0.9952	0.9952	0.9952	0.9952	0.9952
2016	Summer	0.9962	0.9962	0.9962	0.9962	0.9962	0.9962	0.9962	0.9962	0.9962	0.9962	0.9962	0.9962	0.9962	0.9962
2016	Autumn	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947
2016	Winter	0.9935	0.9935	0.9935	0.9935	0.9935	0.9935	0.9935	0.9935	0.9935	0.9935	0.9935	0.9935	0.9935	0.9935
2017	Spring	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951
2017	Summer	0.9958	0.9958	0.9958	0.9958	0.9958	0.9958	0.9958	0.9958	0.9958	0.9958	0.9958	0.9958	0.9958	0.9958
2017	Autumn	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947
2017	Winter	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938
2018	Spring	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949
2018	Summer	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951
2018	Autumn	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945
2018	Winter	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938
2019	Spring	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948	0.9948
2019	Summer	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2019	Autumn	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946	0.9946
2019	Winter	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
2020	Spring	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945
2020	Summer	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950
2020	Autumn	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943
2020	Winter	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933
2021	Spring	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950	0.9950
2021	Summer	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951	0.9951
2021	Autumn	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940	0.9940
2021	Winter	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933	0.9933

2 Offtaking TLMs: Base Case (no P229 i.e. TLFs = 0)

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2012	Spring	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072
2012	Summer	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074
2012	Autumn	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080
2012	Winter	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083
2013	Spring	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067
2013	Summer	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060
2013	Autumn	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074	1.0074
2013	Winter	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084
2014	Spring	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065
2014	Summer	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055	1.0055
2014	Autumn	1.0073	1.0073	1.0073	1.0073	1.0073	1.0073	1.0073	1.0073	1.0073	1.0073	1.0073	1.0073	1.0073	1.0073
2014	Winter	1.0085	1.0085	1.0085	1.0085	1.0085	1.0085	1.0085	1.0085	1.0085	1.0085	1.0085	1.0085	1.0085	1.0085
2015	Spring	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061
2015	Summer	1.0053	1.0053	1.0053	1.0053	1.0053	1.0053	1.0053	1.0053	1.0053	1.0053	1.0053	1.0053	1.0053	1.0053

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2015	Autumn	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072	1.0072
2015	Winter	1.0079	1.0079	1.0079	1.0079	1.0079	1.0079	1.0079	1.0079	1.0079	1.0079	1.0079	1.0079	1.0079	1.0079
2016	Spring	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060
2016	Summer	1.0047	1.0047	1.0047	1.0047	1.0047	1.0047	1.0047	1.0047	1.0047	1.0047	1.0047	1.0047	1.0047	1.0047
2016	Autumn	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065	1.0065
2016	Winter	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080	1.0080
2017	Spring	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060
2017	Summer	1.0052	1.0052	1.0052	1.0052	1.0052	1.0052	1.0052	1.0052	1.0052	1.0052	1.0052	1.0052	1.0052	1.0052
2017	Autumn	1.0066	1.0066	1.0066	1.0066	1.0066	1.0066	1.0066	1.0066	1.0066	1.0066	1.0066	1.0066	1.0066	1.0066
2017	Winter	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077
2018	Spring	1.0063	1.0063	1.0063	1.0063	1.0063	1.0063	1.0063	1.0063	1.0063	1.0063	1.0063	1.0063	1.0063	1.0063
2018	Summer	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060
2018	Autumn	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068
2018	Winter	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077	1.0077
2019	Spring	1.0064	1.0064	1.0064	1.0064	1.0064	1.0064	1.0064	1.0064	1.0064	1.0064	1.0064	1.0064	1.0064	1.0064
2019	Summer	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2019	Autumn	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067	1.0067
2019	Winter	1.0082	1.0082	1.0082	1.0082	1.0082	1.0082	1.0082	1.0082	1.0082	1.0082	1.0082	1.0082	1.0082	1.0082
2020	Spring	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068	1.0068
2020	Summer	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062
2020	Autumn	1.0071	1.0071	1.0071	1.0071	1.0071	1.0071	1.0071	1.0071	1.0071	1.0071	1.0071	1.0071	1.0071	1.0071
2020	Winter	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083
2021	Spring	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061	1.0061
2021	Summer	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060
2021	Autumn	1.0075	1.0075	1.0075	1.0075	1.0075	1.0075	1.0075	1.0075	1.0075	1.0075	1.0075	1.0075	1.0075	1.0075
2021	Winter	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084	1.0084

3 Delivering TLMs: Proposed Modification

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2012	Spring	1.0087	0.9970	1.0224	0.9909	1.0024	0.9828	0.9795	1.0155	1.0138	1.0049	1.0156	0.9880	0.9682	0.9630
2012	Summer	1.0108	1.0002	1.0244	0.9905	1.0039	0.9851	0.9762	1.0173	1.0133	1.0050	1.0164	0.9910	0.9637	0.9597
2012	Autumn	1.0102	0.9971	1.0246	0.9907	1.0029	0.9826	0.9798	1.0177	1.0172	1.0019	1.0153	0.9878	0.9659	0.9575
2012	Winter	1.0062	0.9954	1.0162	0.9941	1.0033	0.9838	0.9790	1.0175	1.0138	1.0045	1.0169	0.9875	0.9671	0.9449
2013	Spring	1.0053	0.9968	1.0193	0.9958	1.0032	0.9847	0.9809	1.0147	1.0103	1.0045	1.0156	0.9903	0.9673	0.9544
2013	Summer	1.0058	0.9964	1.0186	0.9930	1.0013	0.9823	0.9786	1.0129	1.0101	1.0066	1.0146	0.9893	0.9661	0.9567
2013	Autumn	1.0077	0.9963	1.0229	0.9942	1.0028	0.9826	0.9798	1.0176	1.0150	1.0059	1.0177	0.9885	0.9606	0.9449
2013	Winter	1.0073	0.9956	1.0151	0.9953	1.0046	0.9829	0.9786	1.0208	1.0161	1.0068	1.0204	0.9883	0.9601	0.9302
2014	Spring	1.0029	0.9955	1.0125	0.9955	1.0026	0.9849	0.9810	1.0127	1.0087	1.0045	1.0132	0.9895	0.9721	0.9558
2014	Summer	0.9987	0.9954	1.0112	0.9959	1.0005	0.9895	0.9845	1.0043	1.0015	0.9966	1.0036	0.9917	0.9892	0.9849
2014	Autumn	1.0051	0.9955	1.0197	0.9947	1.0026	0.9844	0.9824	1.0138	1.0114	1.0014	1.0123	0.9892	0.9705	0.9550
2014	Winter	1.0077	0.9958	1.0161	0.9961	1.0056	0.9823	0.9784	1.0214	1.0161	1.0072	1.0210	0.9884	0.9596	0.9269
2015	Spring	1.0009	0.9954	1.0091	0.9982	1.0039	0.9866	0.9837	1.0102	1.0060	1.0016	1.0095	0.9909	0.9752	0.9582
2015	Summer	0.9981	0.9951	1.0119	0.9994	1.0027	0.9913	0.9881	1.0023	0.9996	0.9951	1.0013	0.9927	0.9937	0.9906

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2015	Autumn	1.0049	0.9957	1.0202	0.9957	1.0034	0.9835	0.9814	1.0147	1.0118	1.0035	1.0140	0.9891	0.9683	0.9506
2015	Winter	1.0065	0.9951	1.0146	0.9954	1.0030	0.9801	0.9807	1.0196	1.0144	1.0054	1.0189	0.9884	0.9617	0.9339
2016	Spring	1.0012	0.9947	1.0162	0.9970	1.0031	0.9859	0.9830	1.0114	1.0065	1.0028	1.0112	0.9898	0.9750	0.9615
2016	Summer	0.9996	0.9957	1.0121	0.9966	1.0016	0.9884	0.9848	1.0054	1.0024	0.9986	1.0054	0.9912	0.9865	0.9824
2016	Autumn	1.0046	0.9957	1.0201	0.9951	1.0027	0.9840	0.9808	1.0142	1.0115	1.0026	1.0132	0.9893	0.9702	0.9562
2016	Winter	1.0054	0.9953	1.0140	0.9962	1.0013	0.9881	0.9855	1.0174	1.0130	0.9983	1.0156	0.9900	0.9637	0.9373
2017	Spring	0.9990	0.9942	1.0152	0.9976	1.0010	0.9947	0.9899	1.0094	1.0042	1.0004	1.0094	0.9905	0.9782	0.9622
2017	Summer	0.9977	0.9951	1.0099	0.9978	0.9980	0.9984	0.9930	1.0024	0.9999	0.9951	1.0015	0.9924	0.9914	0.9855
2017	Autumn	1.0039	0.9952	1.0113	0.9951	0.9992	0.9922	0.9873	1.0133	1.0105	1.0003	1.0119	0.9897	0.9717	0.9548
2017	Winter	1.0056	0.9954	1.0147	0.9930	0.9995	0.9931	0.9861	1.0184	1.0137	0.9951	1.0172	0.9903	0.9685	0.9404
2018	Spring	0.9996	0.9955	1.0137	0.9989	1.0006	0.9973	0.9914	1.0071	1.0037	0.9882	1.0044	0.9931	0.9803	0.9622
2018	Summer	0.9983	0.9957	1.0097	0.9979	0.9977	1.0010	0.9943	1.0004	0.9998	0.9829	0.9976	0.9943	0.9961	0.9897
2018	Autumn	1.0046	0.9964	1.0190	0.9962	0.9993	0.9938	0.9881	1.0116	1.0103	0.9893	1.0084	0.9921	0.9710	0.9515
2018	Winter	1.0060	0.9950	1.0155	0.9881	0.9978	0.9930	0.9845	1.0201	1.0145	0.9960	1.0200	0.9894	0.9721	0.9433
2019	Spring	0.9999	0.9938	1.0097	0.9879	0.9961	0.9976	0.9896	1.0101	1.0054	0.9906	1.0088	0.9906	0.9919	0.9776
2019	Summer	0.9978	0.9941	1.0096	0.9880	0.9941	1.0020	0.9936	1.0035	1.0005	0.9860	1.0045	0.9923	1.0086	1.0057

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2019	Autumn	1.0031	0.9940	1.0102	0.9862	0.9948	0.9957	0.9879	1.0126	1.0094	0.9922	1.0121	0.9895	0.9886	0.9740
2019	Winter	1.0056	0.9950	1.0170	0.9862	0.9979	0.9921	0.9834	1.0223	1.0160	0.9972	1.0224	0.9890	0.9701	0.9392
2020	Spring	0.9996	0.9942	1.0086	0.9882	0.9966	0.9980	0.9897	1.0088	1.0043	0.9905	1.0077	0.9912	0.9913	0.9742
2020	Summer	0.9979	0.9946	1.0043	0.9889	0.9949	1.0019	0.9938	1.0032	1.0000	0.9857	1.0033	0.9929	1.0072	1.0025
2020	Autumn	1.0030	0.9947	1.0121	0.9869	0.9959	0.9943	0.9865	1.0137	1.0096	0.9926	1.0134	0.9899	0.9831	0.9645
2020	Winter	1.0058	0.9955	1.0180	0.9864	0.9986	0.9922	0.9835	1.0236	1.0171	0.9981	1.0237	0.9894	0.9693	0.9373
2021	Spring	0.9996	0.9942	1.0086	0.9882	0.9966	0.9980	0.9897	1.0088	1.0043	0.9905	1.0077	0.9912	0.9913	0.9742
2021	Summer	0.9978	0.9945	1.0042	0.9888	0.9948	1.0018	0.9937	1.0031	0.9999	0.9856	1.0032	0.9928	1.0071	1.0024
2021	Autumn	1.0029	0.9946	1.0120	0.9868	0.9958	0.9942	0.9864	1.0136	1.0095	0.9925	1.0133	0.9898	0.9830	0.9644
2021	Winter	1.0055	0.9952	1.0177	0.9861	0.9983	0.9919	0.9832	1.0233	1.0168	0.9978	1.0234	0.9891	0.9690	0.9370

4 Offtaking TLMs: Proposed Modification

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2012	Spring	1.0158	1.0041	1.0295	0.9980	1.0095	0.9899	0.9866	1.0226	1.0209	1.0120	1.0227	0.9951	0.9753	0.9701
2012	Summer	1.0169	1.0063	1.0305	0.9966	1.0100	0.9912	0.9823	1.0234	1.0194	1.0111	1.0225	0.9971	0.9698	0.9658
2012	Autumn	1.0172	1.0041	1.0316	0.9977	1.0099	0.9896	0.9868	1.0247	1.0242	1.0089	1.0223	0.9948	0.9729	0.9645
2012	Winter	1.0154	1.0046	1.0254	1.0033	1.0125	0.9930	0.9882	1.0267	1.0230	1.0137	1.0261	0.9967	0.9762	0.9540
2013	Spring	1.0124	1.0039	1.0264	1.0029	1.0103	0.9918	0.9880	1.0218	1.0174	1.0116	1.0227	0.9974	0.9744	0.9615
2013	Summer	1.0129	1.0035	1.0257	1.0001	1.0084	0.9894	0.9857	1.0200	1.0172	1.0137	1.0217	0.9964	0.9732	0.9638
2013	Autumn	1.0148	1.0034	1.0300	1.0013	1.0099	0.9897	0.9869	1.0247	1.0221	1.0130	1.0248	0.9956	0.9677	0.9520
2013	Winter	1.0163	1.0046	1.0241	1.0043	1.0136	0.9919	0.9876	1.0298	1.0251	1.0158	1.0294	0.9973	0.9691	0.9392
2014	Spring	1.0112	1.0038	1.0208	1.0038	1.0109	0.9932	0.9893	1.0210	1.0170	1.0128	1.0215	0.9978	0.9804	0.9641
2014	Summer	1.0064	1.0031	1.0189	1.0036	1.0082	0.9972	0.9922	1.0120	1.0092	1.0043	1.0113	0.9994	0.9969	0.9926
2014	Autumn	1.0128	1.0032	1.0274	1.0024	1.0103	0.9921	0.9901	1.0215	1.0191	1.0091	1.0200	0.9969	0.9782	0.9627
2014	Winter	1.0165	1.0047	1.0250	1.0050	1.0145	0.9911	0.9873	1.0303	1.0249	1.0161	1.0298	0.9973	0.9685	0.9358
2015	Spring	1.0093	1.0038	1.0175	1.0066	1.0123	0.9950	0.9921	1.0186	1.0144	1.0100	1.0179	0.9993	0.9836	0.9666
2015	Summer	1.0049	1.0019	1.0187	1.0062	1.0095	0.9981	0.9949	1.0091	1.0064	1.0019	1.0081	0.9995	1.0005	0.9974

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2015	Autumn	1.0123	1.0031	1.0276	1.0031	1.0108	0.9909	0.9888	1.0221	1.0192	1.0109	1.0214	0.9965	0.9757	0.9580
2015	Winter	1.0156	1.0041	1.0236	1.0044	1.0120	0.9892	0.9898	1.0287	1.0235	1.0145	1.0280	0.9974	0.9708	0.9430
2016	Spring	1.0086	1.0021	1.0236	1.0044	1.0105	0.9933	0.9904	1.0188	1.0139	1.0102	1.0186	0.9972	0.9824	0.9689
2016	Summer	1.0062	1.0023	1.0187	1.0032	1.0082	0.9950	0.9914	1.0120	1.0090	1.0052	1.0120	0.9978	0.9931	0.9890
2016	Autumn	1.0115	1.0026	1.0270	1.0020	1.0096	0.9909	0.9877	1.0211	1.0184	1.0095	1.0201	0.9962	0.9771	0.9631
2016	Winter	1.0147	1.0045	1.0232	1.0054	1.0105	0.9974	0.9947	1.0266	1.0222	1.0075	1.0249	0.9992	0.9729	0.9465
2017	Spring	1.0064	1.0016	1.0226	1.0050	1.0084	1.0021	0.9973	1.0168	1.0116	1.0078	1.0168	0.9979	0.9856	0.9696
2017	Summer	1.0047	1.0021	1.0169	1.0048	1.0050	1.0054	1.0000	1.0094	1.0069	1.0021	1.0085	0.9994	0.9984	0.9925
2017	Autumn	1.0115	1.0028	1.0189	1.0027	1.0068	0.9998	0.9949	1.0209	1.0181	1.0079	1.0195	0.9973	0.9793	0.9624
2017	Winter	1.0138	1.0036	1.0229	1.0012	1.0077	1.0013	0.9943	1.0266	1.0219	1.0033	1.0255	0.9985	0.9768	0.9486
2018	Spring	1.0077	1.0036	1.0218	1.0070	1.0087	1.0054	0.9995	1.0152	1.0118	0.9963	1.0125	1.0012	0.9884	0.9703
2018	Summer	1.0061	1.0035	1.0175	1.0057	1.0055	1.0088	1.0021	1.0082	1.0076	0.9907	1.0054	1.0021	1.0039	0.9975
2018	Autumn	1.0121	1.0039	1.0265	1.0037	1.0068	1.0013	0.9956	1.0191	1.0178	0.9968	1.0159	0.9996	0.9785	0.9590
2018	Winter	1.0139	1.0028	1.0234	0.9960	1.0057	1.0009	0.9924	1.0280	1.0223	1.0038	1.0279	0.9973	0.9799	0.9512
2019	Spring	1.0077	1.0016	1.0175	0.9957	1.0039	1.0054	0.9974	1.0179	1.0132	0.9984	1.0166	0.9984	0.9997	0.9854
2019	Summer	1.0044	1.0007	1.0162	0.9946	1.0007	1.0086	1.0002	1.0101	1.0071	0.9926	1.0111	0.9989	1.0152	1.0123

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2019	Autumn	1.0105	1.0014	1.0176	0.9936	1.0022	1.0031	0.9953	1.0200	1.0168	0.9996	1.0195	0.9969	0.9960	0.9814
2019	Winter	1.0137	1.0031	1.0251	0.9943	1.0060	1.0002	0.9915	1.0304	1.0241	1.0053	1.0305	0.9971	0.9782	0.9473
2020	Spring	1.0082	1.0028	1.0172	0.9968	1.0052	1.0066	0.9983	1.0174	1.0129	0.9991	1.0163	0.9998	0.9999	0.9828
2020	Summer	1.0054	1.0021	1.0118	0.9964	1.0024	1.0094	1.0013	1.0107	1.0075	0.9932	1.0108	1.0004	1.0147	1.0100
2020	Autumn	1.0109	1.0026	1.0200	0.9948	1.0038	1.0022	0.9944	1.0216	1.0175	1.0005	1.0213	0.9978	0.9910	0.9724
2020	Winter	1.0133	1.0030	1.0255	0.9939	1.0061	0.9997	0.9910	1.0311	1.0246	1.0056	1.0312	0.9969	0.9768	0.9448
2021	Spring	1.0076	1.0022	1.0166	0.9962	1.0046	1.0060	0.9977	1.0168	1.0123	0.9985	1.0157	0.9992	0.9993	0.9822
2021	Summer	1.0054	1.0021	1.0118	0.9964	1.0024	1.0094	1.0013	1.0107	1.0075	0.9932	1.0108	1.0004	1.0147	1.0100
2021	Autumn	1.0111	1.0028	1.0202	0.9950	1.0040	1.0024	0.9946	1.0218	1.0177	1.0007	1.0215	0.9980	0.9912	0.9726
2021	Winter	1.0134	1.0031	1.0256	0.9940	1.0062	0.9998	0.9911	1.0312	1.0247	1.0057	1.0313	0.9970	0.9769	0.9449

5 Delivering TLMs: Alternative Modification

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2012	Spring	0.9974	0.9948	1.0011	0.9934	0.9960	0.9917	0.9909	0.9989	0.9986	0.9965	0.9990	0.9928	0.9882	0.9870
2012	Summer	0.9974	0.9952	0.9994	0.9932	0.9960	0.9921	0.9903	0.9987	0.9979	0.9962	0.9985	0.9933	0.9877	0.9869
2012	Autumn	0.9970	0.9943	0.9985	0.9930	0.9956	0.9914	0.9908	0.9985	0.9985	0.9954	0.9982	0.9925	0.9878	0.9861
2012	Winter	0.9965	0.9938	0.9991	0.9933	0.9953	0.9911	0.9902	0.9988	0.9981	0.9965	0.9990	0.9922	0.9868	0.9825
2013	Spring	0.9969	0.9950	0.9997	0.9948	0.9963	0.9925	0.9917	0.9989	0.9979	0.9969	0.9991	0.9937	0.9887	0.9857
2013	Summer	0.9974	0.9954	1.0000	0.9946	0.9964	0.9924	0.9916	0.9992	0.9984	0.9979	0.9995	0.9939	0.9884	0.9865
2013	Autumn	0.9966	0.9945	0.9995	0.9940	0.9957	0.9918	0.9913	0.9988	0.9981	0.9967	0.9988	0.9929	0.9875	0.9845
2013	Winter	0.9960	0.9936	0.9993	0.9936	0.9954	0.9912	0.9905	0.9987	0.9978	0.9962	0.9987	0.9922	0.9869	0.9814
2014	Spring	0.9970	0.9950	1.0004	0.9948	0.9967	0.9922	0.9913	0.9995	0.9985	0.9978	0.9998	0.9934	0.9885	0.9839
2014	Summer	0.9970	0.9956	1.0008	0.9954	0.9971	0.9930	0.9915	0.9989	0.9981	0.9971	0.9991	0.9942	0.9908	0.9886
2014	Autumn	0.9969	0.9945	1.0002	0.9941	0.9961	0.9915	0.9912	0.9990	0.9985	0.9966	0.9990	0.9929	0.9876	0.9838
2014	Winter	0.9960	0.9936	0.9992	0.9936	0.9955	0.9910	0.9903	0.9987	0.9977	0.9962	0.9987	0.9922	0.9868	0.9808
2015	Spring	0.9969	0.9951	1.0011	0.9958	0.9976	0.9924	0.9916	0.9998	0.9985	0.9976	0.9997	0.9936	0.9890	0.9841
2015	Summer	0.9967	0.9954	1.0012	0.9969	0.9983	0.9937	0.9926	0.9986	0.9974	0.9959	0.9983	0.9943	0.9946	0.9934

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2015	Autumn	0.9968	0.9945	1.0004	0.9944	0.9963	0.9915	0.9910	0.9993	0.9986	0.9970	0.9994	0.9929	0.9877	0.9836
2015	Winter	0.9963	0.9939	0.9996	0.9939	0.9955	0.9909	0.9910	0.9990	0.9980	0.9964	0.9990	0.9925	0.9872	0.9819
2016	Spring	0.9967	0.9950	1.0005	0.9956	0.9971	0.9926	0.9920	0.9995	0.9982	0.9975	0.9995	0.9937	0.9896	0.9862
2016	Summer	0.9974	0.9960	1.0017	0.9963	0.9981	0.9934	0.9922	0.9995	0.9984	0.9971	0.9996	0.9944	0.9926	0.9912
2016	Autumn	0.9972	0.9949	1.0009	0.9947	0.9966	0.9919	0.9912	0.9996	0.9990	0.9972	0.9996	0.9933	0.9883	0.9849
2016	Winter	0.9960	0.9938	0.9994	0.9940	0.9951	0.9923	0.9918	0.9987	0.9977	0.9949	0.9984	0.9926	0.9873	0.9820
2017	Spring	0.9963	0.9948	1.0002	0.9956	0.9966	0.9946	0.9934	0.9992	0.9978	0.9971	0.9994	0.9937	0.9898	0.9856
2017	Summer	0.9967	0.9955	1.0013	0.9963	0.9966	0.9962	0.9943	0.9987	0.9976	0.9960	0.9984	0.9943	0.9928	0.9903
2017	Autumn	0.9969	0.9948	1.0005	0.9947	0.9958	0.9939	0.9928	0.9993	0.9986	0.9966	0.9991	0.9935	0.9888	0.9850
2017	Winter	0.9963	0.9941	0.9998	0.9935	0.9950	0.9935	0.9921	0.9992	0.9981	0.9944	0.9990	0.9929	0.9884	0.9825
2018	Spring	0.9964	0.9950	1.0004	0.9960	0.9965	0.9953	0.9937	0.9987	0.9976	0.9934	0.9981	0.9942	0.9902	0.9849
2018	Summer	0.9962	0.9953	1.0000	0.9961	0.9960	0.9969	0.9947	0.9971	0.9968	0.9912	0.9962	0.9947	0.9951	0.9930
2018	Autumn	0.9970	0.9949	1.0003	0.9947	0.9956	0.9940	0.9928	0.9988	0.9984	0.9938	0.9982	0.9938	0.9885	0.9840
2018	Winter	0.9964	0.9941	0.9998	0.9926	0.9947	0.9935	0.9918	0.9995	0.9983	0.9946	0.9996	0.9928	0.9892	0.9833
2019	Spring	0.9963	0.9945	1.0003	0.9929	0.9952	0.9954	0.9933	0.9992	0.9980	0.9940	0.9991	0.9936	0.9936	0.9895
2019	Summer	0.9959	0.9950	0.9988	0.9935	0.9950	0.9968	0.9948	0.9972	0.9966	0.9929	0.9975	0.9945	0.9983	0.9975

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2019	Autumn	0.9969	0.9945	1.0006	0.9925	0.9948	0.9944	0.9927	0.9995	0.9986	0.9945	0.9995	0.9933	0.9920	0.9881
2019	Winter	0.9958	0.9937	0.9986	0.9919	0.9943	0.9930	0.9913	0.9994	0.9981	0.9945	0.9995	0.9924	0.9887	0.9826
2020	Spring	0.9960	0.9944	0.9986	0.9926	0.9951	0.9953	0.9930	0.9989	0.9975	0.9938	0.9988	0.9934	0.9933	0.9886
2020	Summer	0.9957	0.9948	0.9974	0.9932	0.9949	0.9967	0.9945	0.9972	0.9963	0.9928	0.9975	0.9943	0.9981	0.9971
2020	Autumn	0.9965	0.9944	0.9987	0.9924	0.9946	0.9941	0.9923	0.9991	0.9982	0.9942	0.9992	0.9931	0.9913	0.9869
2020	Winter	0.9957	0.9938	0.9982	0.9919	0.9944	0.9930	0.9914	0.9992	0.9981	0.9945	0.9994	0.9926	0.9888	0.9819
2021	Spring	0.9958	0.9945	0.9988	0.9929	0.9956	0.9955	0.9935	0.9995	0.9982	0.9943	0.9992	0.9938	0.9936	0.9880
2021	Summer	0.9953	0.9947	0.9977	0.9929	0.9949	0.9966	0.9945	0.9979	0.9972	0.9931	0.9978	0.9942	0.9981	0.9963
2021	Autumn	0.9955	0.9939	0.9983	0.9917	0.9944	0.9937	0.9920	0.9988	0.9981	0.9941	0.9992	0.9927	0.9912	0.9862
2021	Winter	0.9956	0.9937	0.9981	0.9918	0.9943	0.9929	0.9914	0.9989	0.9979	0.9943	0.9992	0.9925	0.9888	0.9815

6 Offtaking TLMs: Alternative Modification

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2012	Spring	1.0091	1.0065	1.0128	1.0051	1.0077	1.0034	1.0026	1.0106	1.0103	1.0082	1.0107	1.0045	0.9999	0.9987
2012	Summer	1.0095	1.0073	1.0115	1.0053	1.0081	1.0042	1.0024	1.0108	1.0100	1.0083	1.0106	1.0054	0.9998	0.9990
2012	Autumn	1.0100	1.0073	1.0115	1.0060	1.0086	1.0044	1.0038	1.0115	1.0115	1.0084	1.0112	1.0055	1.0008	0.9991
2012	Winter	1.0100	1.0074	1.0126	1.0068	1.0088	1.0047	1.0037	1.0123	1.0116	1.0100	1.0125	1.0057	1.0003	0.9961
2013	Spring	1.0080	1.0061	1.0108	1.0059	1.0074	1.0036	1.0028	1.0100	1.0090	1.0080	1.0102	1.0048	0.9998	0.9968
2013	Summer	1.0074	1.0054	1.0100	1.0046	1.0064	1.0024	1.0016	1.0092	1.0084	1.0079	1.0095	1.0039	0.9984	0.9965
2013	Autumn	1.0087	1.0066	1.0116	1.0061	1.0078	1.0039	1.0034	1.0109	1.0102	1.0088	1.0109	1.0050	0.9996	0.9966
2013	Winter	1.0096	1.0073	1.0129	1.0072	1.0091	1.0049	1.0041	1.0124	1.0114	1.0099	1.0124	1.0059	1.0006	0.9950
2014	Spring	1.0077	1.0057	1.0111	1.0055	1.0074	1.0029	1.0020	1.0102	1.0092	1.0085	1.0105	1.0041	0.9992	0.9946
2014	Summer	1.0064	1.0050	1.0102	1.0048	1.0065	1.0024	1.0009	1.0083	1.0075	1.0065	1.0085	1.0036	1.0002	0.9980
2014	Autumn	1.0088	1.0064	1.0121	1.0060	1.0080	1.0034	1.0031	1.0109	1.0104	1.0085	1.0109	1.0048	0.9995	0.9957
2014	Winter	1.0098	1.0074	1.0130	1.0074	1.0093	1.0048	1.0041	1.0125	1.0115	1.0100	1.0125	1.0060	1.0006	0.9946
2015	Spring	1.0070	1.0052	1.0112	1.0059	1.0077	1.0025	1.0017	1.0099	1.0086	1.0077	1.0098	1.0037	0.9991	0.9942
2015	Summer	1.0053	1.0040	1.0098	1.0055	1.0069	1.0023	1.0012	1.0072	1.0060	1.0045	1.0069	1.0029	1.0032	1.0020

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2015	Autumn	1.0084	1.0061	1.0120	1.0060	1.0079	1.0031	1.0026	1.0109	1.0102	1.0086	1.0110	1.0045	0.9993	0.9952
2015	Winter	1.0092	1.0068	1.0126	1.0068	1.0084	1.0038	1.0040	1.0119	1.0109	1.0093	1.0119	1.0054	1.0001	0.9948
2016	Spring	1.0066	1.0049	1.0104	1.0055	1.0070	1.0025	1.0019	1.0094	1.0081	1.0074	1.0094	1.0036	0.9995	0.9961
2016	Summer	1.0053	1.0039	1.0096	1.0042	1.0060	1.0013	1.0001	1.0074	1.0063	1.0050	1.0075	1.0023	1.0005	0.9991
2016	Autumn	1.0078	1.0055	1.0115	1.0053	1.0072	1.0025	1.0018	1.0102	1.0096	1.0078	1.0102	1.0039	0.9989	0.9955
2016	Winter	1.0092	1.0070	1.0126	1.0071	1.0083	1.0055	1.0049	1.0118	1.0109	1.0081	1.0116	1.0058	1.0005	0.9952
2017	Spring	1.0064	1.0049	1.0103	1.0057	1.0067	1.0047	1.0035	1.0093	1.0079	1.0072	1.0095	1.0038	0.9999	0.9957
2017	Summer	1.0053	1.0041	1.0099	1.0049	1.0052	1.0048	1.0029	1.0073	1.0062	1.0046	1.0070	1.0029	1.0014	0.9989
2017	Autumn	1.0076	1.0055	1.0112	1.0054	1.0065	1.0046	1.0035	1.0100	1.0093	1.0073	1.0098	1.0042	0.9995	0.9957
2017	Winter	1.0088	1.0066	1.0124	1.0061	1.0075	1.0060	1.0046	1.0117	1.0107	1.0069	1.0116	1.0054	1.0009	0.9951
2018	Spring	1.0069	1.0055	1.0109	1.0065	1.0070	1.0058	1.0042	1.0092	1.0081	1.0039	1.0086	1.0047	1.0007	0.9954
2018	Summer	1.0061	1.0052	1.0099	1.0060	1.0059	1.0068	1.0046	1.0070	1.0067	1.0011	1.0061	1.0046	1.0050	1.0029
2018	Autumn	1.0081	1.0060	1.0114	1.0058	1.0067	1.0051	1.0039	1.0099	1.0095	1.0049	1.0093	1.0049	0.9996	0.9951
2018	Winter	1.0088	1.0065	1.0122	1.0050	1.0071	1.0059	1.0042	1.0119	1.0107	1.0070	1.0120	1.0052	1.0016	0.9957
2019	Spring	1.0067	1.0049	1.0107	1.0033	1.0056	1.0058	1.0037	1.0096	1.0084	1.0044	1.0095	1.0040	1.0040	0.9999
2019	Summer	1.0057	1.0048	1.0086	1.0033	1.0048	1.0066	1.0046	1.0070	1.0064	1.0027	1.0073	1.0043	1.0081	1.0073

BSC Year	BSC Season	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
2019	Autumn	1.0076	1.0052	1.0113	1.0032	1.0055	1.0051	1.0034	1.0102	1.0093	1.0052	1.0102	1.0040	1.0027	0.9988
2019	Winter	1.0091	1.0070	1.0119	1.0052	1.0076	1.0063	1.0046	1.0127	1.0114	1.0078	1.0128	1.0057	1.0020	0.9959
2020	Spring	1.0072	1.0056	1.0098	1.0038	1.0063	1.0065	1.0042	1.0101	1.0087	1.0050	1.0100	1.0046	1.0045	0.9998
2020	Summer	1.0060	1.0051	1.0077	1.0035	1.0052	1.0070	1.0048	1.0075	1.0066	1.0031	1.0078	1.0046	1.0084	1.0074
2020	Autumn	1.0081	1.0060	1.0103	1.0040	1.0062	1.0057	1.0039	1.0107	1.0098	1.0058	1.0108	1.0047	1.0029	0.9985
2020	Winter	1.0091	1.0072	1.0116	1.0053	1.0078	1.0064	1.0048	1.0126	1.0115	1.0079	1.0128	1.0060	1.0022	0.9953
2021	Spring	1.0060	1.0047	1.0090	1.0031	1.0058	1.0057	1.0037	1.0097	1.0084	1.0045	1.0094	1.0040	1.0038	0.9982
2021	Summer	1.0053	1.0047	1.0077	1.0029	1.0049	1.0066	1.0045	1.0079	1.0072	1.0031	1.0078	1.0042	1.0081	1.0063
2021	Autumn	1.0079	1.0063	1.0107	1.0041	1.0068	1.0061	1.0044	1.0112	1.0105	1.0065	1.0116	1.0051	1.0036	0.9986
2021	Winter	1.0092	1.0073	1.0117	1.0054	1.0079	1.0065	1.0050	1.0125	1.0115	1.0079	1.0128	1.0061	1.0024	0.9951