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Demand Estimation Sub Committee

3.0 Gas Demand EUC Modelling Results

(2 of 3) Small NDM Results

22 May 2024

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Gas Demand EUC Modelling Results

SMALL NDM BACKGROUND

Small NDM Population - AQ & Supply Point Count

- Small NDM is the main component of the overall NDM:
 - Band 1 (0-73.2 MWh pa) constitutes nearly 3/4 of overall NDM (on an AQ basis)
 - Bands 1 to 2 (0-293 MWh pa) constitutes nearly 4/5 of overall NDM
 - Bands 1 to 4 (0-2196 MWh pa) constitutes nearly 9/10 of overall NDM
- Large NDM is very much a minority component of overall NDM

EUC Bands: Range	% of Total NDM	
	Total AQ	Total SP Count
Band 1: 0 to 73.2 MWh pa	71.48%	99.02%
Bands 1 to 2: 0 to 293 MWh pa	77.95%	99.75%
Bands 1 to 4: 0 to 2,196 MWh pa	87.41%	99.98%
Bands 5 to 9: >2,196 MWh pa	12.59%	0.02%

Population Size - April 2024 NDM

- The table below highlights the current population size (Class 3 and 4 only) for each LDZ and EUC combination
- These values are used to calculate the Target Sample Size

EUC Band	Customer Type	LDZ												Total	
		SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO		SW
1	Dom Non-PrePay	1,919,102	1,167,449	2,607,742	1,356,218	2,354,575	1,991,566	244,503	814,262	1,948,908	2,122,938	2,461,258	1,751,877	1,590,160	22,330,558
	I&C Non-PrePay	41,090	27,221	66,430	38,189	54,306	46,084	7,413	20,988	41,728	61,550	57,492	40,839	40,460	543,790
	Dom PrePay	222,387	142,870	307,080	129,290	193,004	187,320	25,968	88,685	130,425	218,428	212,103	89,117	98,771	2,045,448
	I&C PrePay	181	141	479	221	310	291	45	169	212	610	514	135	208	3,516
2	Dom Non-PrePay	3,247	1,673	4,282	2,572	4,524	3,283	250	948	3,585	7,695	10,064	2,987	2,097	47,207
	I&C Non-PrePay	11,743	6,979	15,689	8,567	13,299	12,189	1,638	4,350	10,912	16,534	14,468	11,067	9,324	136,759
	Dom PrePay	122	82	189	113	127	144	7	73	105	203	161	62	49	1,437
	I&C PrePay	7	7	6	2	5	5	0	2	4	11	8	5	1	63
3	All	4,002	2,171	4,479	2,275	3,663	3,574	414	1,147	3,180	5,402	4,262	3,067	2,373	40,009
4	All	1,723	788	1,677	908	1,401	1,464	205	490	1,200	2,549	1,509	1,188	874	15,976
Small NDM Total		2,203,604	1,349,381	3,008,053	1,538,355	2,625,214	2,245,920	280,443	931,114	2,140,259	2,435,920	2,761,839	1,900,344	1,744,317	25,164,763

EUC Bands / Consumption Ranges for Small NDM (<2,196 MWh pa)

- The EUC Bands and Consumption Ranges are not prescribed in Uniform Network Code and are the responsibility of DESC to agree ahead of each Gas Year
- The following summarises what DESC agreed as part of approving this year's Modelling Approach document:

Consumption Range (kWh P.A.)		EUC Description	Consumer Type	No. of Models Required
From	To			
0	73,200	xx:Eyy01BND	Domestic	1
0	73,200	xx:Eyy01BPD	Prepayment Domestic	1
0	73,200	xx:Eyy01BNI	I&C	1
0	73,200	xx:Eyy01BPI	Prepayment I&C	1
73,201	293,000	xx:Eyy02BND	Domestic	1
73,201	293,000	xx:Eyy02BPD	Prepayment Domestic	1
73,201	293,000	xx:Eyy02BNI	I&C	1
73,201	293,000	xx:Eyy02BPI	Prepayment I&C	1

Consumption Range (kWh P.A.)		EUC Description					No. of Models Required
From	To	Bucket Band	WAR Band 1	WAR Band 2	WAR Band 3	WAR Band 4	
293,001	732,000	xx:Eyy03B	xx:Eyy03W01	xx:Eyy03W02	xx:Eyy03W03	xx:Eyy03W04	5
732,001	2,196,000	xx:Eyy04B	xx:Eyy04W01	xx:Eyy04W02	xx:Eyy04W03	xx:Eyy04W04	5

Summary of Validated Data

- Validated sample counts post-stratification – numbers provided are supply points

EUC Bands: AQ Range Source data	2023/24 data		2022/23 data	
Band 1: 0 to 73.2 MWh pa Third party provided and Class 3 (Domestic Pre-Payment only)	Domestic	4,904	Domestic	4,541
	Non-Domestic	3,267	Non-Domestic	4,634
	Domestic Prepayment	4,287	Domestic Prepayment	3,863
	Non-Domestic Pre-payment	6	Non-Domestic Pre-payment	2
Band 2: 73.2 to 293 MWh pa Transporter-managed and Third party provided	Domestic	476	Domestic	359
	Non-Domestic	4,239	Non-Domestic	4,515
	Domestic Prepayment	1	Domestic Prepayment	1
	Non-Domestic Pre-payment	0	Non-Domestic Pre-payment	1
Bands 3 to 4: 293 to 2,196 MWh pa Transporter-managed and Third party provided	5,519		6,201	
Bands 5 to 9: > 2,196 MWh pa Transporter-managed and Third party provided	1,301		1,866	
TOTAL	24,000		25,983	

- Overall, this year there were fewer sample points available for modelling. Bands 5 to 9 have been particularly impacted which is likely to mean more modelling aggregations will be required

Gas Demand EUC Modelling Results

SMALL NDM: DOMESTIC EUC RESULTS

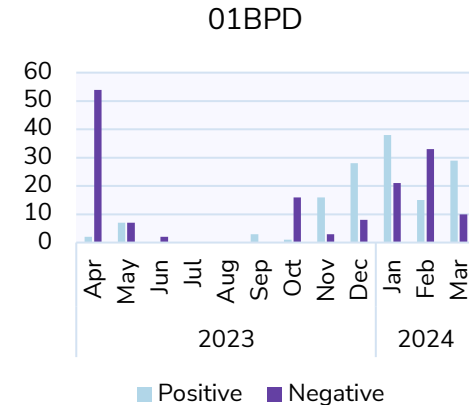
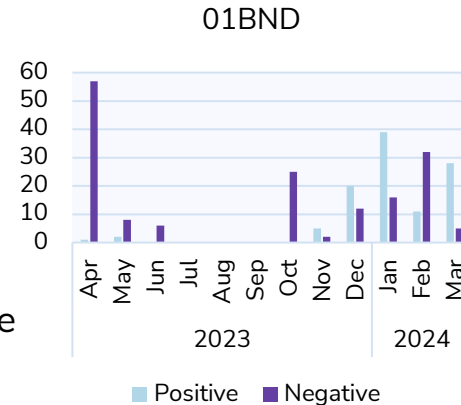
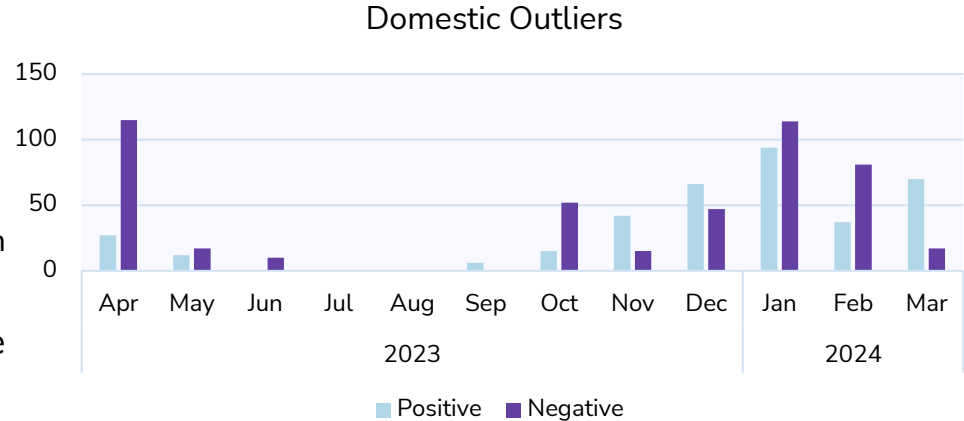
Small NDM : Domestic Agreed Modelling Runs

Band / Range	Description	EUC	Modelling Runs
Band 1 0 to 73.2 MWh p.a.	Non-Prepayment	01BND	Individual LDZ analysis
	Prepayment	01BPD	Individual LDZ analysis
Band 2 73.2 to 293 MWh p.a.	Non-Prepayment	02BND	Individual LDZ analysis except WN (+NW) and WS +(SW)
	Prepayment	02BPD	No Model Available (Lack of Data)

EUC	Validated Sample Count by LDZ													Total
	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	
01BND	364	384	385	378	386	385	345	383	385	357	385	385	382	4,904
01BPD	230	344	385	334	356	384	253	277	384	334	239	383	384	4,287
02BND	33	40	47	30	35	47	11	13	38	59	46	43	34	476
02BPD	0	0	0	0	0	0	0	0	0	1	0	0	0	1

Results : Small NDM Domestic Outliers

- The chart on the right shows the frequency of outliers by month
 - Negative outliers are where consumption was much lower than the model predicted
 - Positive outliers are where consumption was much higher than the model predicted
- In all LDZs we have seen an increase in negative outliers at the beginning of the Analysis Period
 - Potential outlier count is 39 domestic models (13 LDZs x 3, 01BND, 01BPD and 02BND) x the number of days in the month, so the outlier counts are quite low
 - 01BND and 01BPD show a similar pattern in outliers, suggesting similar behaviour
- We are happy that the outliers are genuine and so the recommendation is to retain all days in the Analysis Period

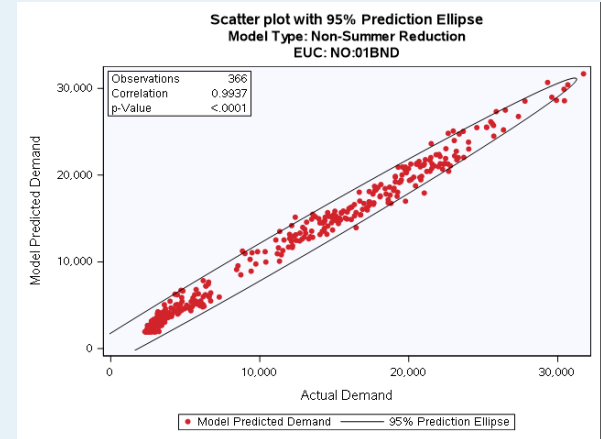
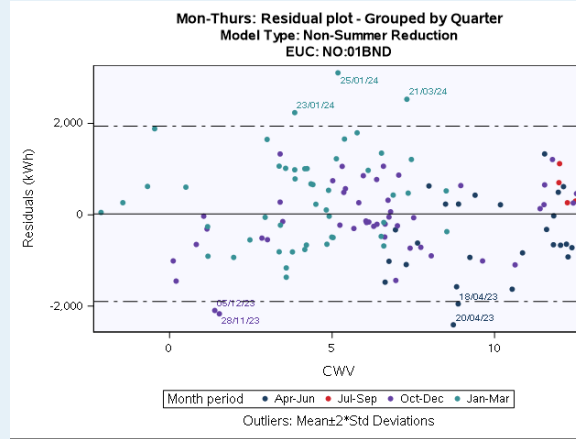
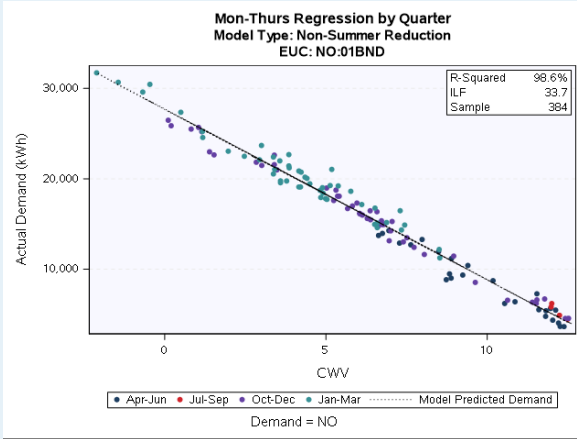


Results - Small NDM : 01BND Summary

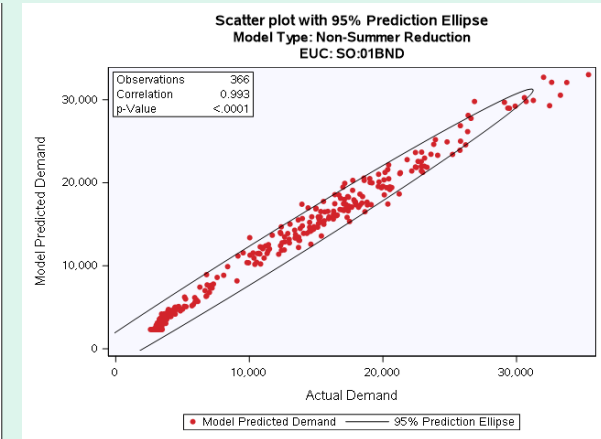
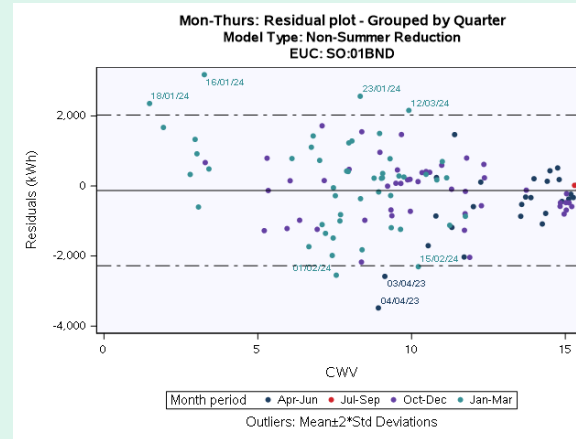
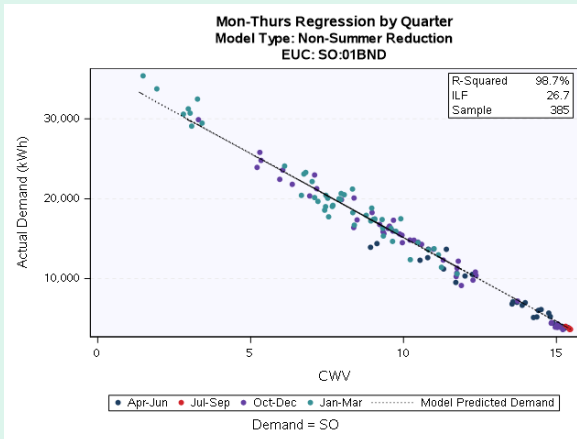
- Sample Grouping - Individual LDZ Analysis
- Sample Sizes are close to or equal to the target for all LDZs
- Previous 2 years used in average are 2021/22 and 2022/23
- R^2 values are better or the same as average of the previous years
- ILF values are down in all cases suggesting an increase in weather sensitivity

LDZ	R^2			Sample Size		ILF		
	Avg. prev 2 years		2023/24		2023/24	Avg. prev 2 years		2023/24
SC	98.3%	↗	98.7%	●	364	34.8	↓	32.5
NO	98.5%	↗	98.6%	●	384	35.7	↓	33.7
NW	98.3%	↗	98.5%	●	385	31.7	↓	29.9
NE	98.0%	↗	98.3%	●	378	32.8	↓	31.4
EM	98.6%	↔	98.6%	●	386	31.7	↓	29.0
WM	98.4%	↗	98.8%	●	385	29.9	↓	28.4
WN	97.8%	↔	97.8%	●	345	32.0	↓	29.2
WS	97.9%	↗	98.7%	●	383	31.3	↓	29.0
EA	98.6%	↗	98.7%	●	385	31.8	↓	29.4
NT	98.7%	↗	98.9%	●	357	32.2	↓	30.7
SE	98.7%	↗	99.0%	●	385	30.4	↓	28.4
SO	98.4%	↗	98.7%	●	385	28.5	↓	26.7
SW	98.1%	↗	98.6%	●	382	29.8	↓	26.8

Results – Small NDM : 01BND Selected LDZs

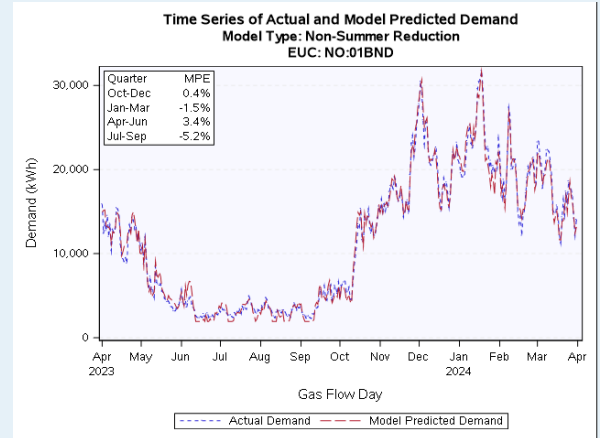
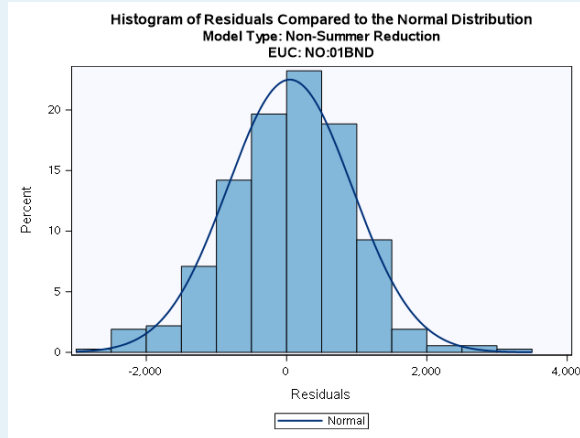
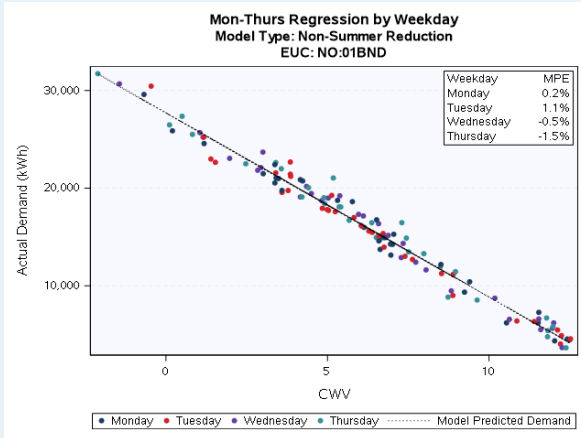


Highest ILF

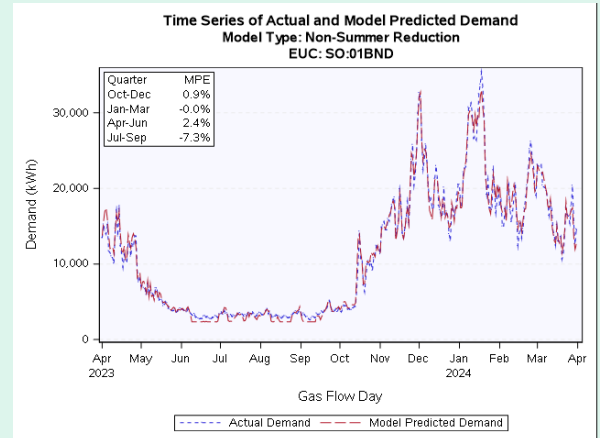
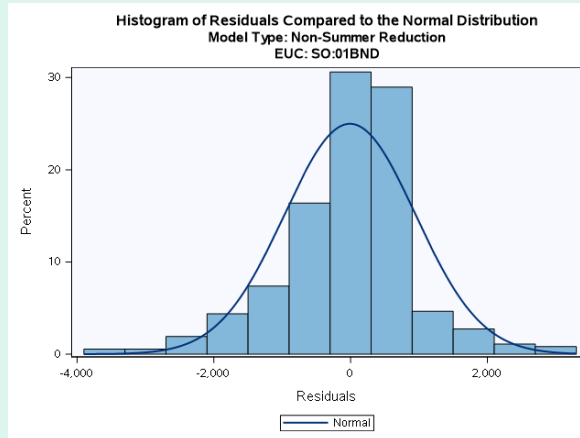
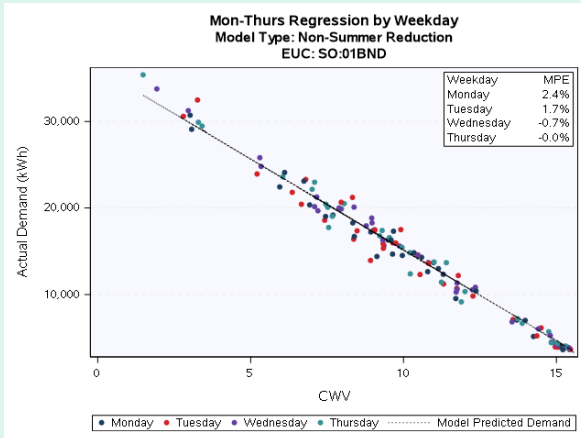


Lowest ILF

Results – Small NDM : 01BND Selected LDZs



Highest ILF



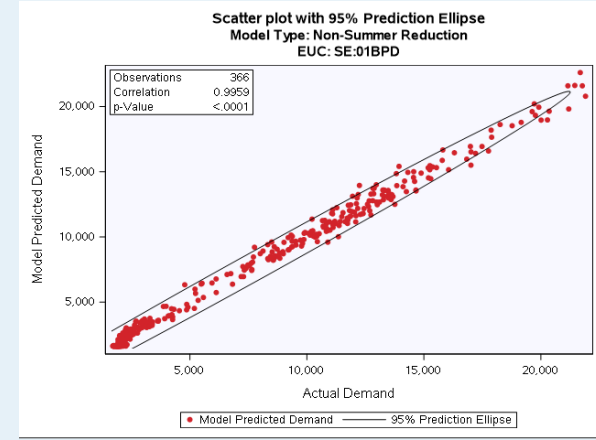
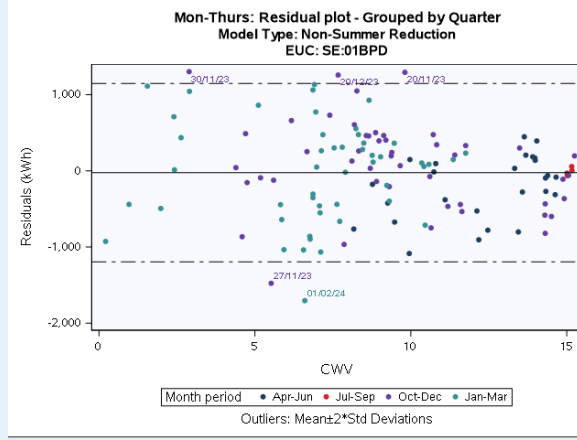
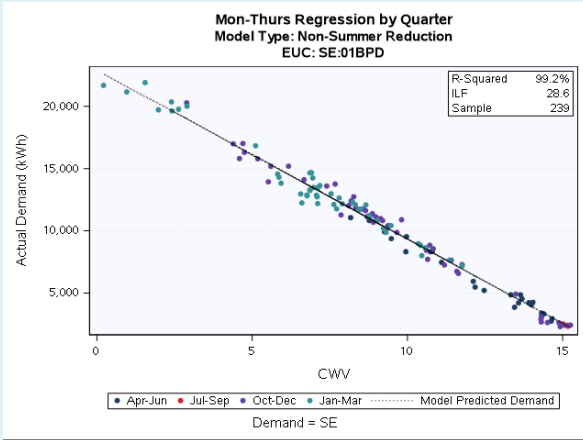
Lowest ILF

Results - Small NDM : 01BPD Summary

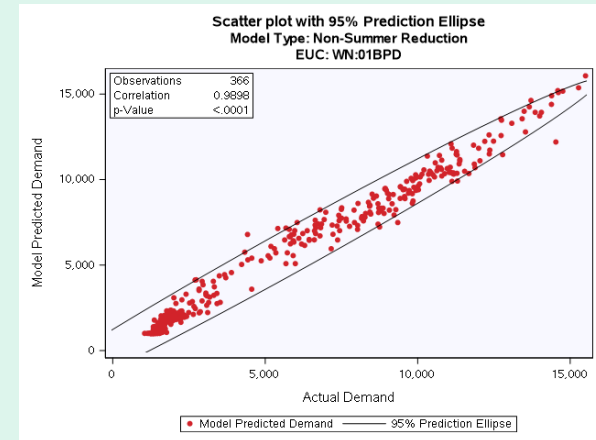
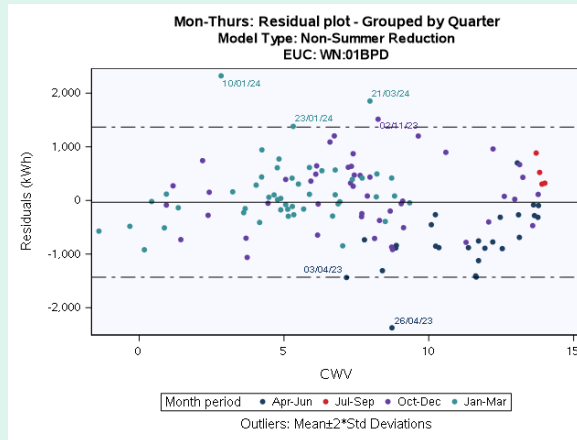
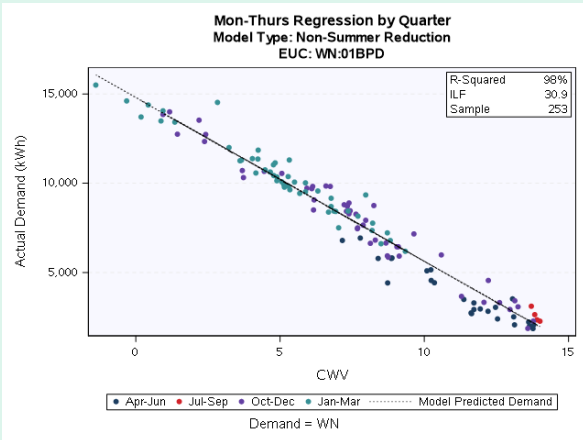
- Sample Grouping - Individual LDZ Analysis
- Sample Sizes are good, with most close to or equal to the target
- Previous 2 years used in average are 2021/22 and 2022/23
- R^2 values are all better than average of the previous years
- ILF values are down in all cases suggesting an increase in weather sensitivity, similar to 01BND

LDZ	R^2			Sample Size		ILF		
	Avg. prev 2 years		2023/24		2023/24	Avg. prev 2 years		2023/24
SC	97.3%	↗	98.8%	●	230	36.9	↓	33.6
NO	97.7%	↗	98.6%	●	344	37.2	↓	34.7
NW	97.3%	↗	98.6%	●	385	34.9	↓	31.4
NE	97.4%	↗	98.6%	●	334	35.2	↓	32.4
EM	98.5%	↗	99.1%	●	356	32.6	↓	31.6
WM	98.1%	↗	99.1%	●	384	32.9	↓	30.9
WN	96.7%	↗	98.0%	●	253	34.2	↓	30.9
WS	97.8%	↗	98.8%	●	277	32.8	↓	30.4
EA	98.0%	↗	98.8%	●	384	32.1	↓	30.3
NT	98.7%	↗	99.0%	●	334	32.9	↓	31.0
SE	98.3%	↗	99.2%	●	239	32.5	↓	28.6
SO	98.1%	↗	98.9%	●	383	28.8	↓	27.1
SW	98.2%	↗	98.8%	●	384	29.1	↓	28.2

Results – Small NDM : 01BPD Selected LDZs

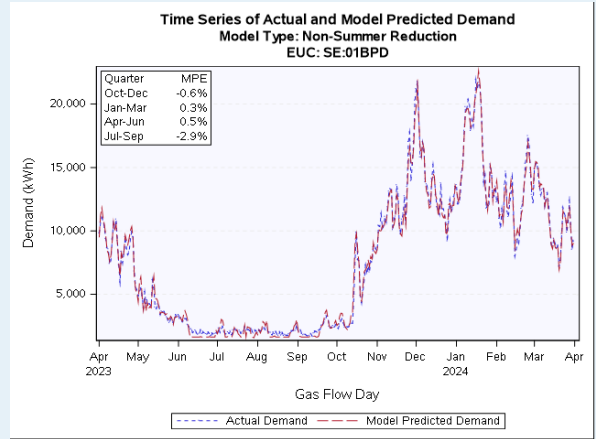
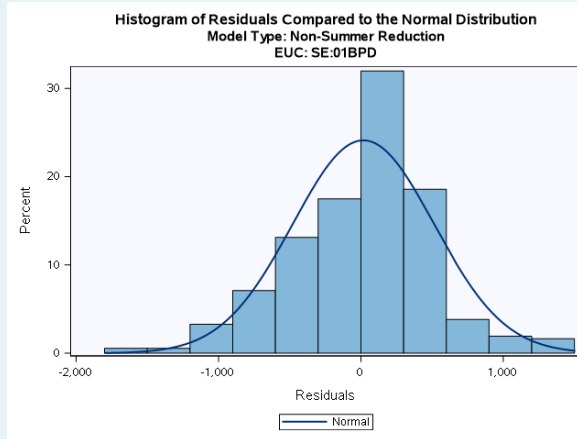
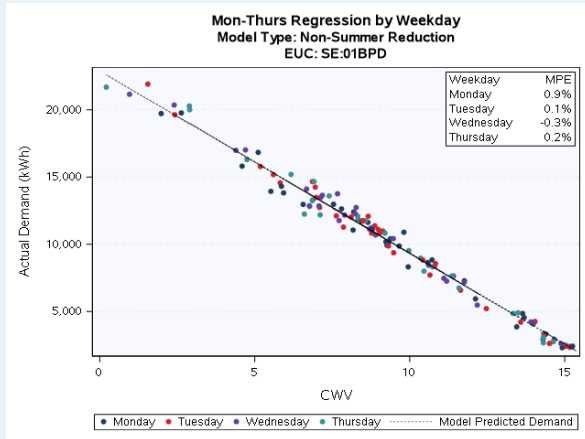


Highest R²

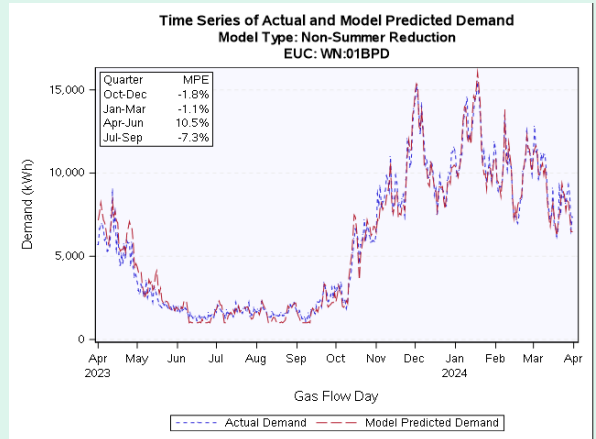
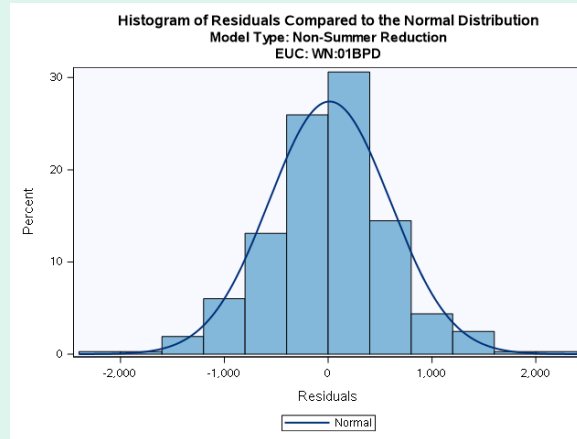
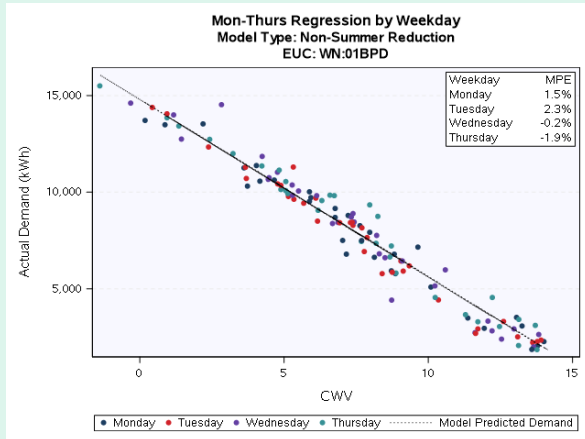


Lowest R²

Results – Small NDM : 01BPD Selected LDZs



Highest R²



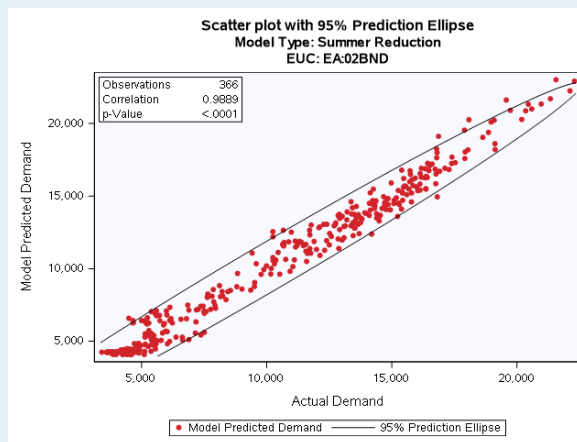
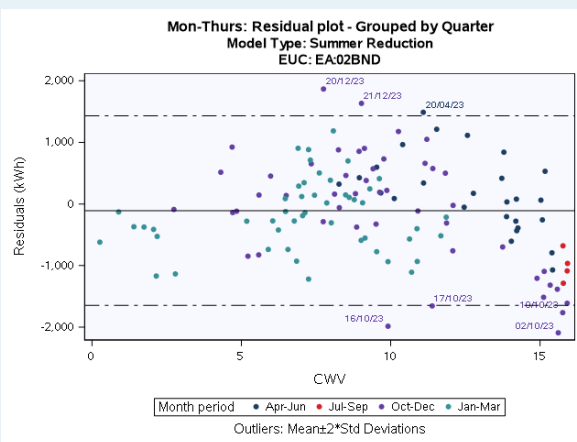
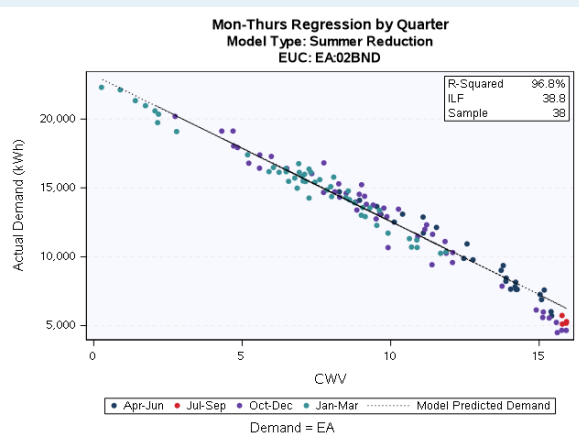
Lowest R²

Results - Small NDM : 02BND Summary

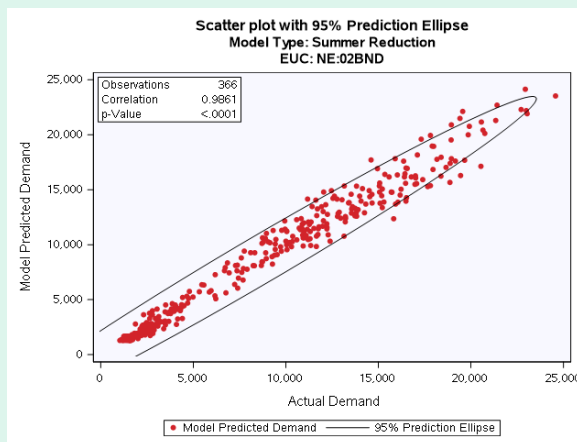
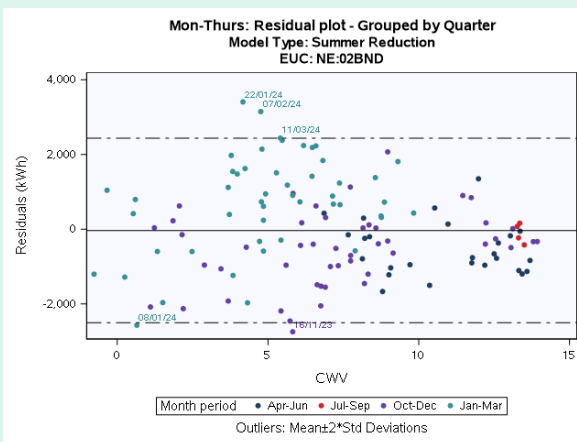
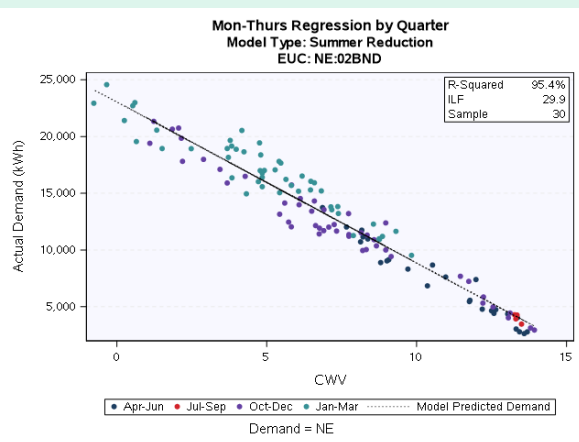
- Sample Grouping - Individual LDZ analysis except WN (+NW) and WS +(SW)
- Sample Sizes are adequate, with most LDZs having the minimum 30 sample sites
- Previous 2 years used in average are 2021/22 and 2022/23
- R² values are better than average of the previous years for most LDZs
 - R² values for NE, WM, EA and SO have dropped slightly
- ILF values are down in most cases suggesting an increase in weather sensitivity, (similar to 01BND), however 2 areas have seen an increase in ILF
- Model results can be expected to be more sporadic for this EUC due to small sample numbers and suspicion on accuracy of Market Sector Code

LDZ	R ²		Sample Size		ILF	
	Avg. prev 2 years	2023/24	2023/24	Avg. prev 2 years	2023/24	
SC	95.1%	↑ 97.9%	●	33	37.8 ↓ 37.5	
NO	95.5%	↗ 97.3%	●	40	39.8 ↓ 37.1	
NW	96.5%	↗ 97.9%	●	47	36.2 ↓ 36.1	
NE	96.6%	↘ 95.4%	●	30	36.6 ↓ 29.9	
EM	96.2%	↗ 96.5%	●	35	35.1 ↑ 36.6	
WM	95.4%	↘ 95.1%	●	47	34.2 ↓ 32.6	
WN	96.2%	↗ 97.6%	●	58	37.7 ↓ 36.4	
WS	96.0%	↗ 97.5%	●	47	38.9 ↓ 36.6	
EA	97.2%	↘ 96.8%	●	38	36.9 ↑ 38.8	
NT	97.0%	↗ 97.7%	●	59	38.7 ↓ 37.1	
SE	96.3%	↑ 98.4%	●	46	36.8 ↓ 33.3	
SO	95.2%	↘ 94.9%	●	43	34.6 ↓ 33.8	
SW	95.9%	↗ 97.1%	●	34	38.0 ↓ 34.8	

Results – Small NDM : 02BND Selected LDZs

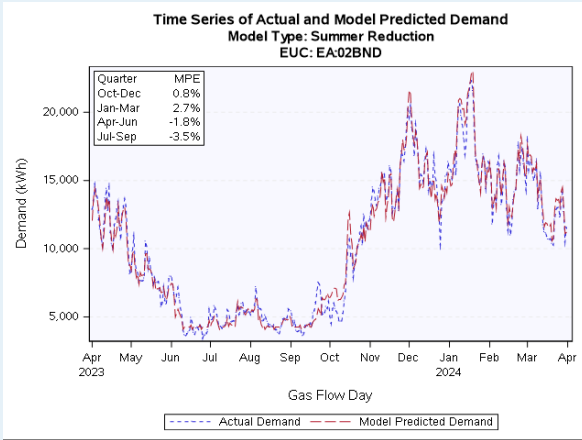
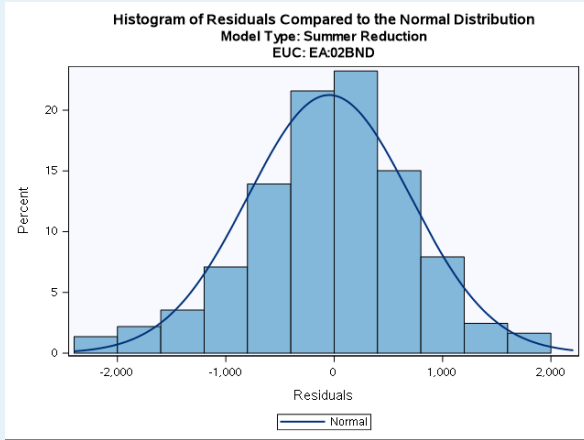
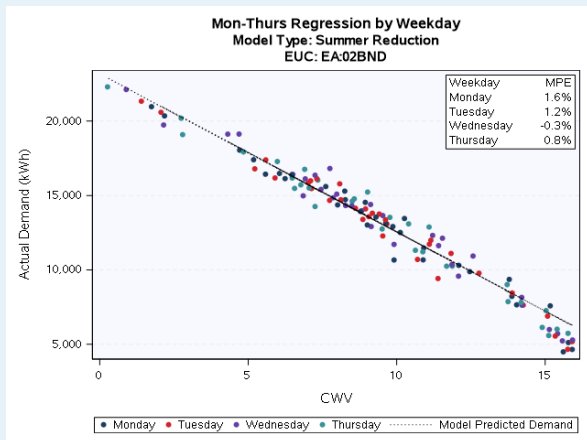


Highest ILF

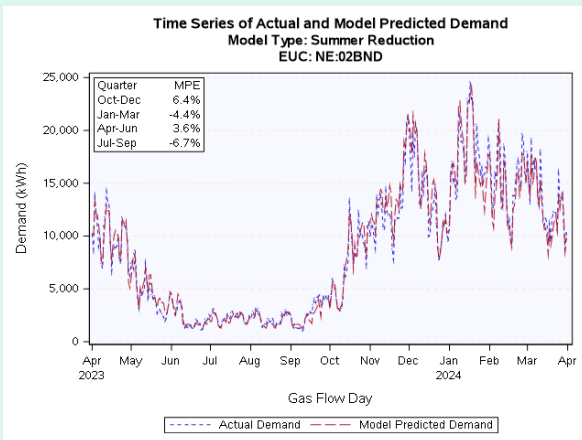
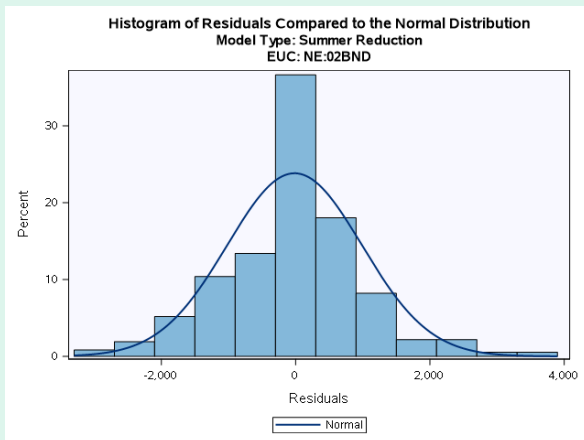
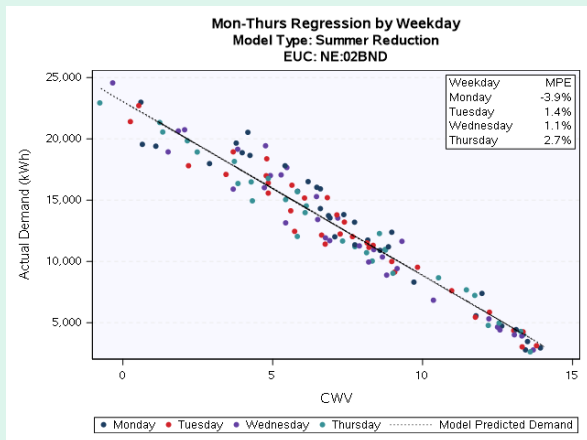


Lowest ILF

Results – Small NDM : 02BND Selected LDZs



Highest ILF



Lowest ILF

Gas Demand EUC Modelling Results

SMALL NDM: I&C EUC CONSUMPTION BAND RESULTS

Small NDM : I&C Agreed Modelling Runs

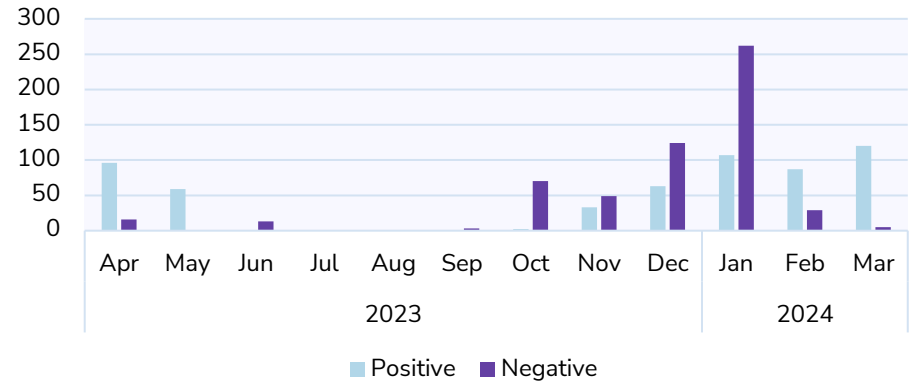
Band / Range	Description	EUC	Modelling Runs
Band 1 0 to 73.2 MWh p.a.	Non-Prepayment	01BNI	Individual LDZ analysis
	Prepayment	01BPI	No Model Available (Lack of Data)
Band 2 73.2 to 293 MWh p.a.	Non-Prepayment	02BNI	Individual LDZ analysis
	Prepayment	02BPI	No Model Available (Lack of Data)
Band 3 293 to 732 MWh p.a.	Non-Prepayment	03B	Individual LDZ analysis
Band 4 732 to 2,196 MWh p.a.	Non-Prepayment	04B	Individual LDZ analysis

EUC	Validated Sample Count by LDZ													Total
	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	
01BNI	270	249	278	259	291	271	49	251	284	254	288	264	259	3,267
01BPI	0	2	0	3	0	0	0	0	1	0	0	0	0	6
02BNI	373	314	380	342	375	372	40	324	301	359	339	372	348	4,239
02BPI	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03B	351	182	338	192	225	224	36	124	272	327	260	225	188	2,944
04B	315	189	216	257	183	203	32	105	185	276	251	213	150	2,575

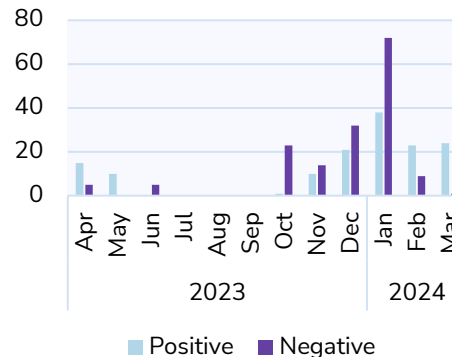
Results : Small NDM I&C Outliers

- The chart on the right shows the frequency of outliers by month
 - Negative outliers are where consumption was much lower than the model predicted
 - Positive outliers are where consumption was much higher than the model predicted
- In all LDZs we have seen an increase in negative outliers in January 2024
 - There are 52 Small I&C models (13 LDZs x 4, 01BNI, 02BNI, 03B and 04B) x number of days in month
 - The Negative outliers are during cold weather and appears that consumers are not increasing consumption as much as expected
- We are happy that the outliers are genuine and so the recommendation is to retain all days in the Analysis Period

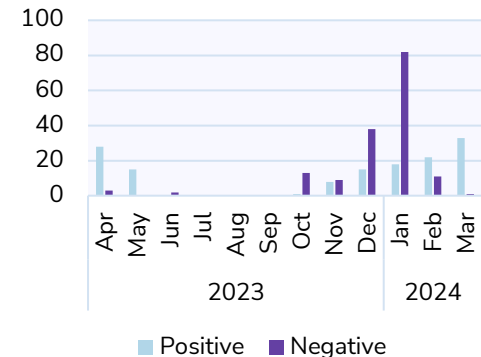
Small I&C Outliers



02BNI



03B

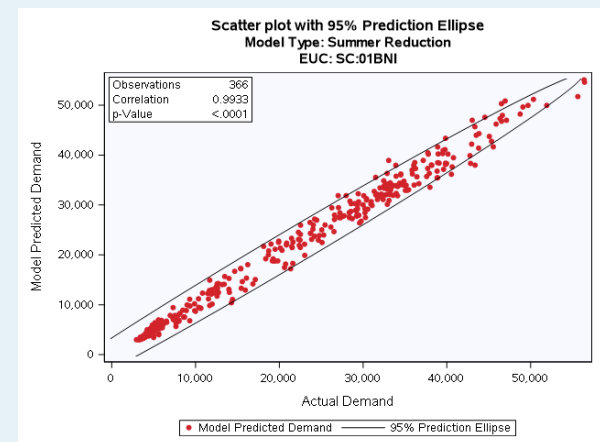
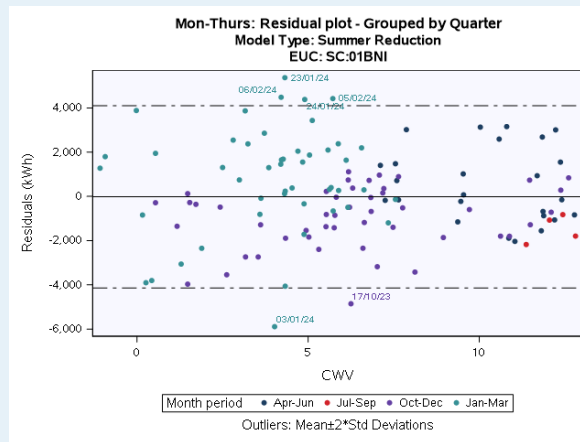
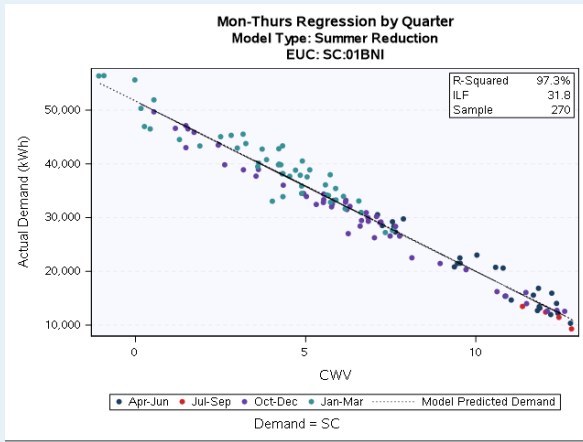


Results - Small NDM : 01BNI Summary

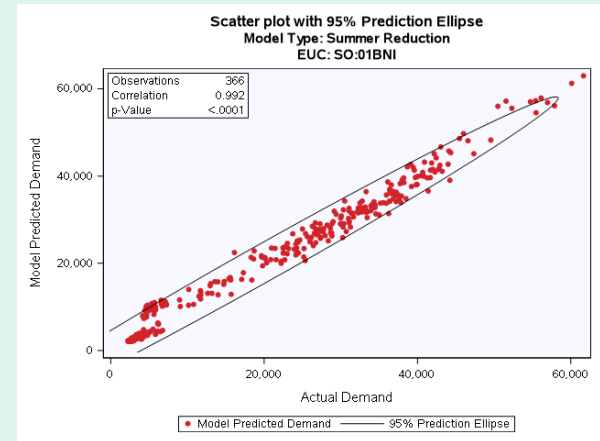
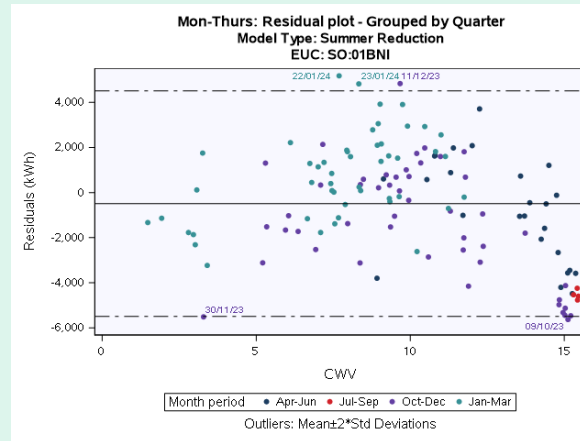
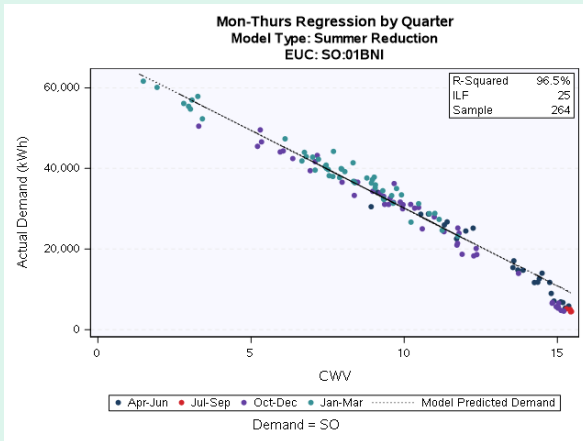
- Sample Grouping - Individual LDZ analysis
- Sample Sizes are good with only WN having a fairly low count
- Previous 2 years used in average are 2021/22 and 2022/23
- R^2 values are similar to previous years
- ILF values are all lower than in previous years, suggesting an increase in weather sensitivity

LDZ	R^2		Sample Size		ILF	
	Avg. prev 2 years	2023/24	2023/24		Avg. prev 2 years	2023/24
SC	97.0%	↗ 97.3%	●	270	33.2	↓ 31.8
NO	97.8%	↘ 97.4%	●	249	32.2	↓ 30.8
NW	97.1%	↘ 96.1%	●	278	29.6	↓ 26.1
NE	97.5%	↘ 97.4%	●	259	31.2	↓ 29.1
EM	97.3%	↗ 98.3%	●	291	30.2	↓ 27.7
WM	97.4%	↘ 97.0%	●	271	29.0	↓ 26.8
WN	94.8%	↗ 96.7%	●	49	32.9	↓ 30.0
WS	96.9%	↘ 95.6%	●	251	29.3	↓ 25.5
EA	97.9%	↗ 98.6%	●	284	31.9	↓ 29.1
NT	97.5%	↘ 97.1%	●	254	32.4	↓ 28.5
SE	97.5%	↗ 97.8%	●	288	28.0	↓ 26.9
SO	97.0%	↘ 96.5%	●	264	25.8	↓ 25.0
SW	97.7%	↘ 96.5%	●	259	28.0	↓ 26.2

Results – Small NDM : 01BNI Selected LDZs

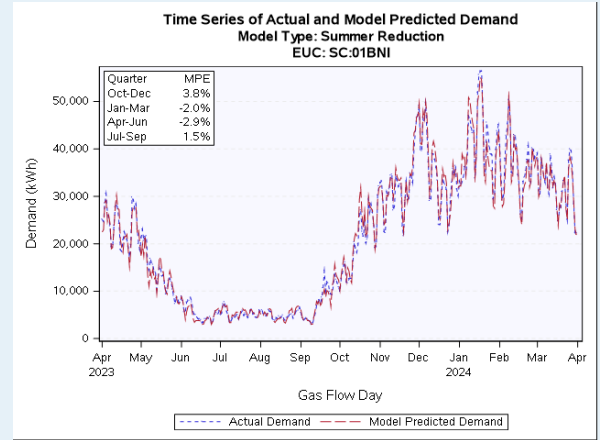
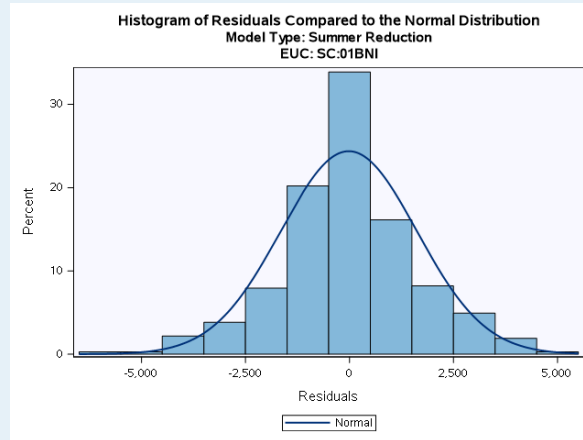
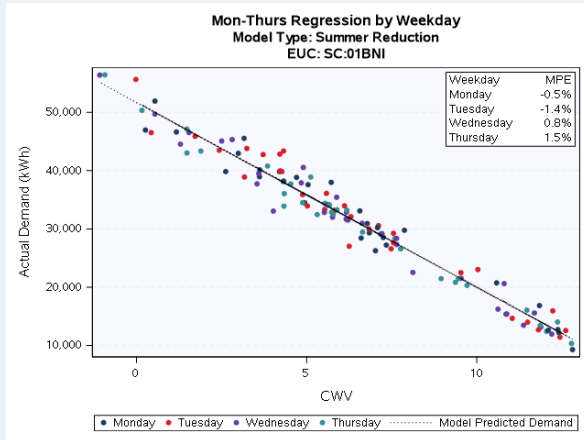


Highest ILF

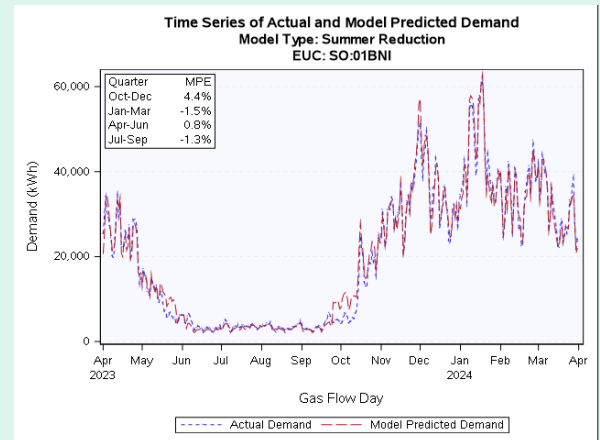
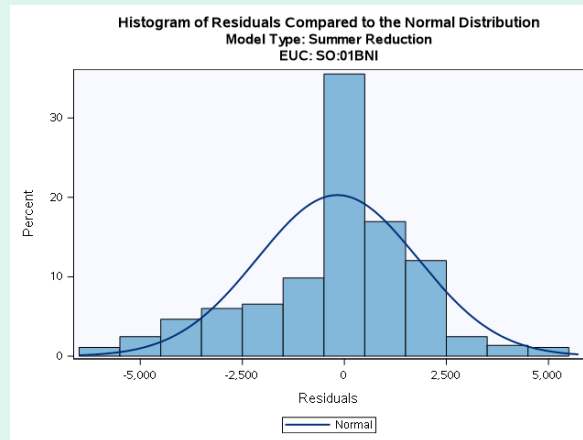
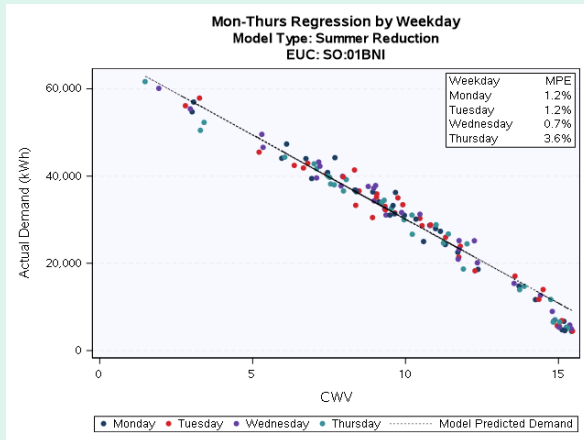


Lowest ILF

Results – Small NDM : 01BNI Selected LDZs



Highest ILF



Lowest ILF

Results - Small NDM : 02BNI Summary

- Sample Grouping - Individual LDZ analysis
- Sample Sizes are good with only WN having a fairly low count
- Previous 2 years used in average are 2021/22 and 2022/23
- R^2 values are similar to previous years with all values within 1.5% of previous results
- ILF values are generally lower than in previous years, suggesting an increase in weather sensitivity, SE is the exception

LDZ	R^2		Sample Size	ILF	
	Avg. prev 2 years	2023/24	2023/24	Avg. prev 2 years	2023/24
SC	96.7%	96.8%	373	35.7	33.3
NO	97.7%	97.5%	314	37.4	34.9
NW	96.3%	95.6%	380	33.9	28.9
NE	97.3%	96.9%	342	36.0	32.9
EM	97.0%	96.7%	375	32.5	29.8
WM	95.7%	96.5%	372	32.0	31.0
WN	95.2%	94.0%	40	34.7	31.4
WS	95.2%	93.9%	324	33.5	27.8
EA	95.8%	97.3%	301	32.5	31.2
NT	96.3%	96.2%	359	35.1	31.3
SE	95.0%	96.3%	339	30.0	31.5
SO	96.7%	96.5%	372	30.1	27.1
SW	96.8%	96.3%	348	31.7	29.1

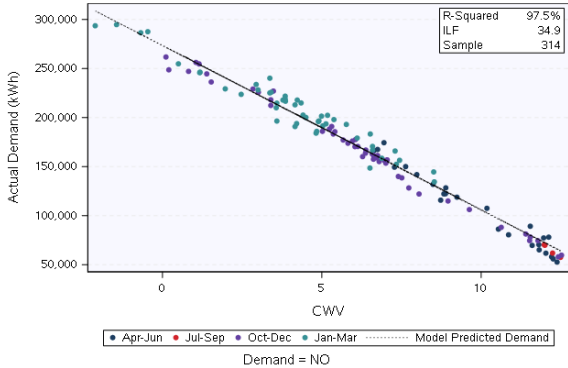
Results – Small NDM : 02BNI Selected LDZs

Highest R²

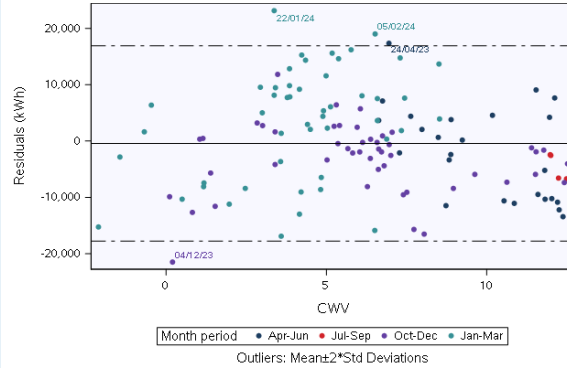
Lowest R²

27

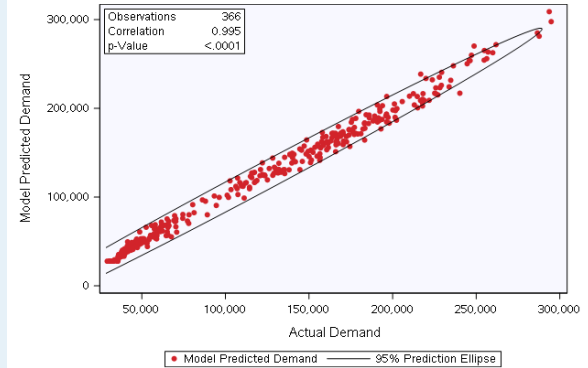
Mon-Thurs Regression by Quarter
Model Type: Summer Reduction
EUC: NO:02BNI



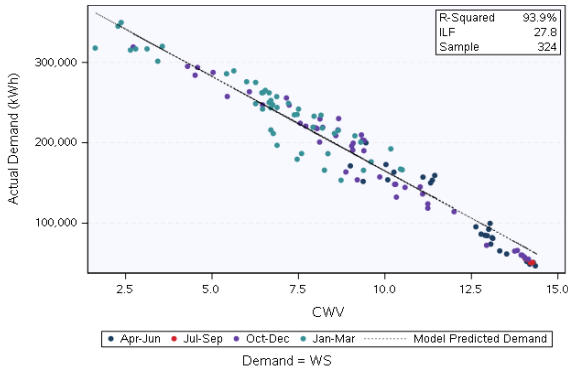
Mon-Thurs: Residual plot - Grouped by Quarter
Model Type: Summer Reduction
EUC: NO:02BNI



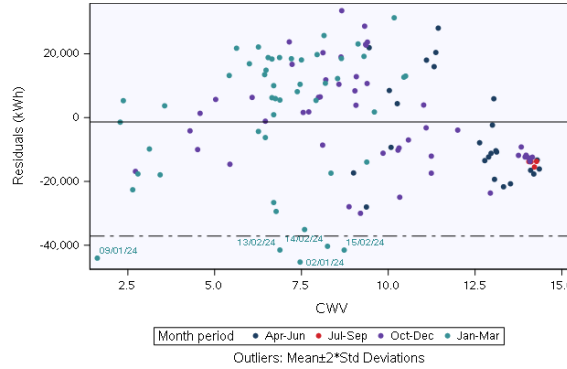
Scatter plot with 95% Prediction Ellipse
Model Type: Summer Reduction
EUC: NO:02BNI



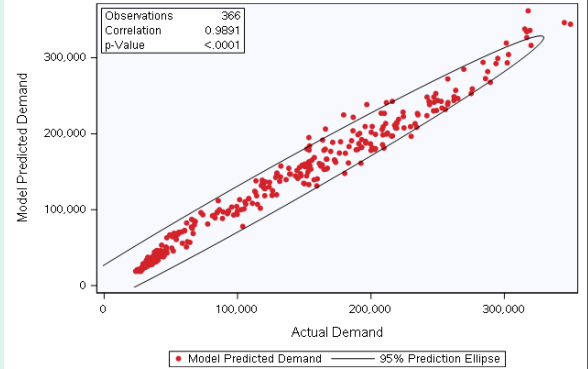
Mon-Thurs Regression by Quarter
Model Type: Summer Reduction
EUC: WS:02BNI



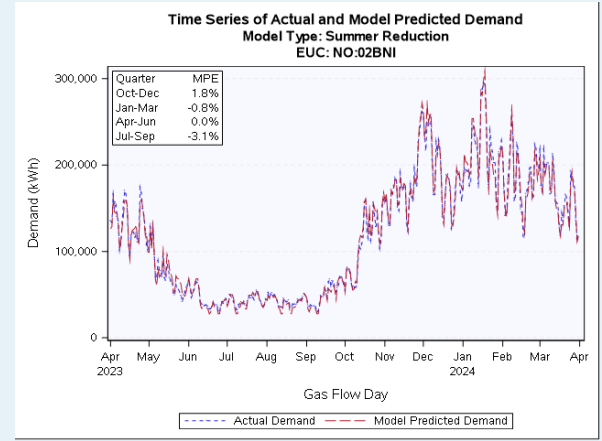
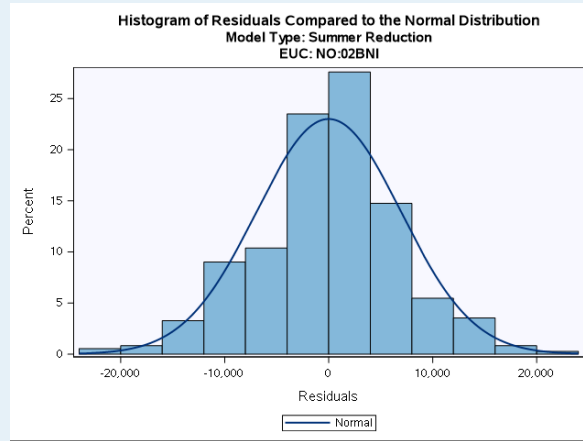
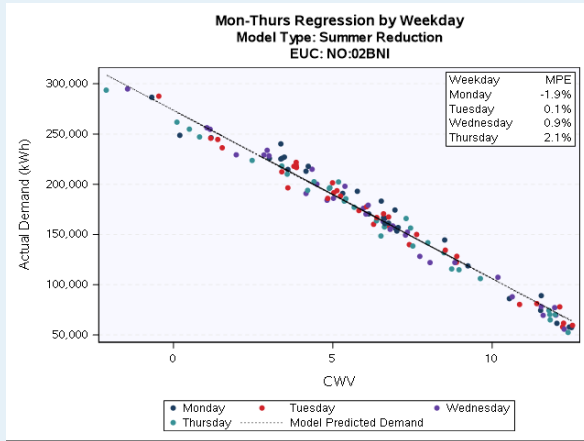
Mon-Thurs: Residual plot - Grouped by Quarter
Model Type: Summer Reduction
EUC: WS:02BNI



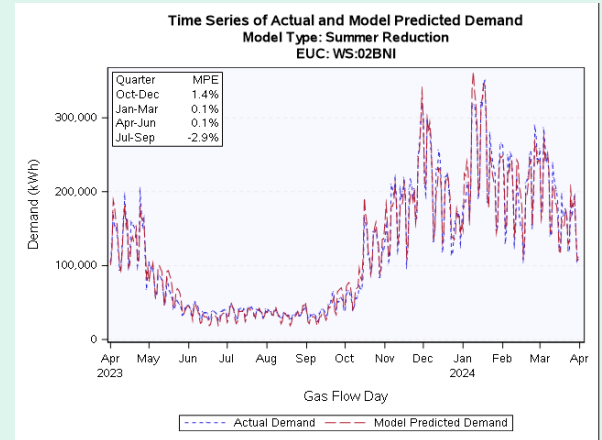
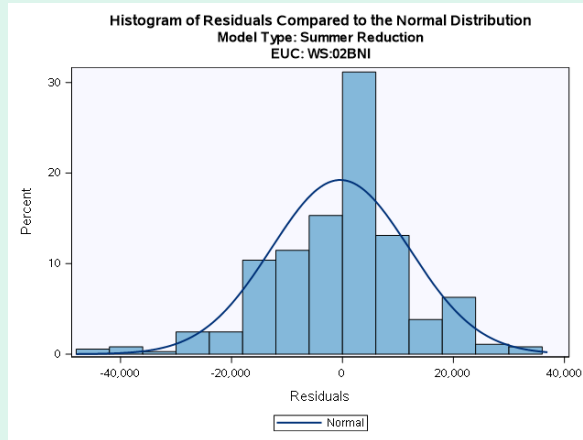
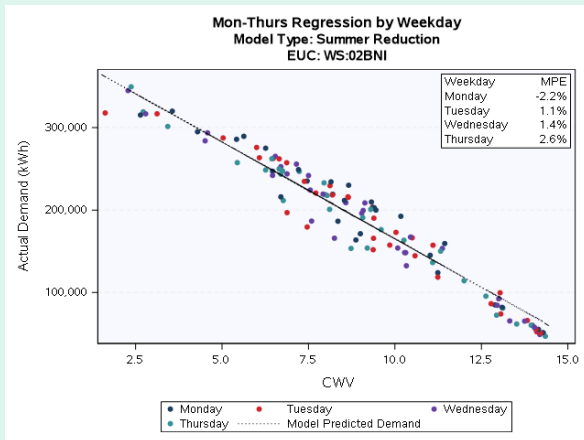
Scatter plot with 95% Prediction Ellipse
Model Type: Summer Reduction
EUC: WS:02BNI



Results – Small NDM : 02BNI Selected LDZs



Highest R²



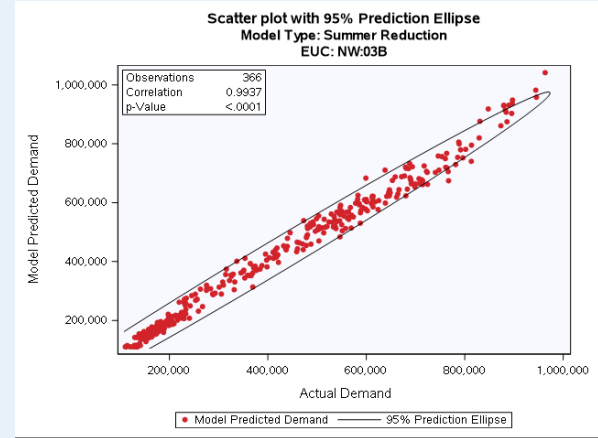
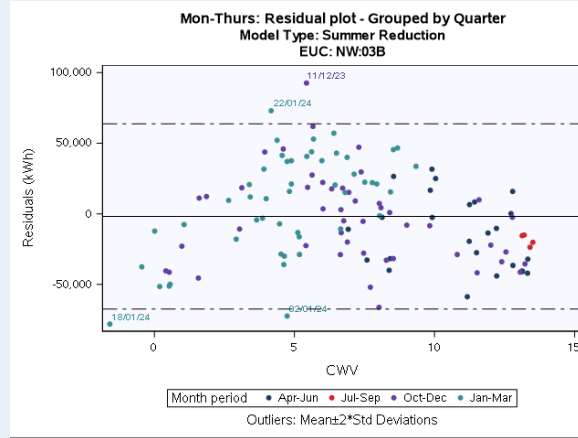
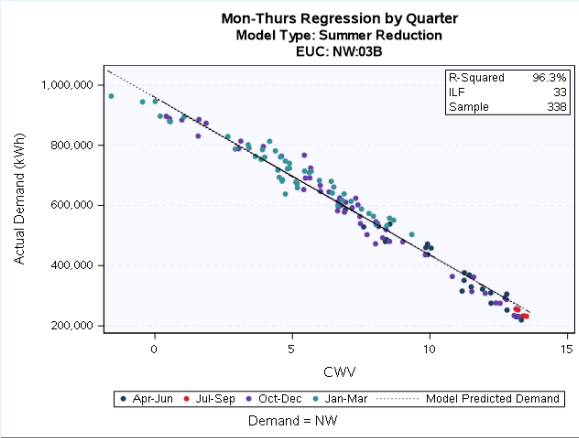
Lowest R²

Results - Small NDM : 03B Summary

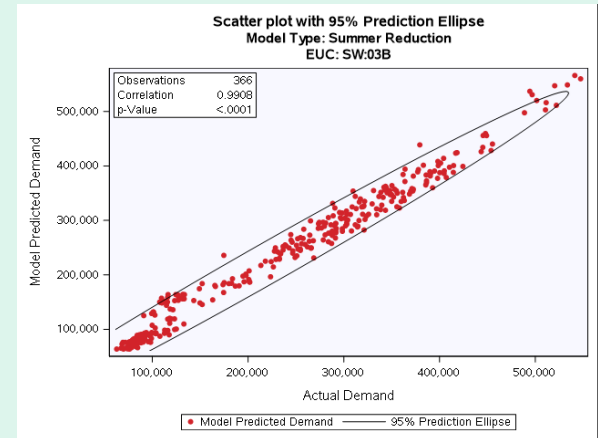
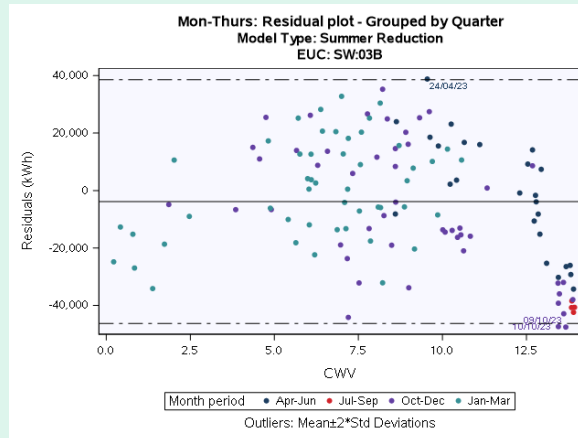
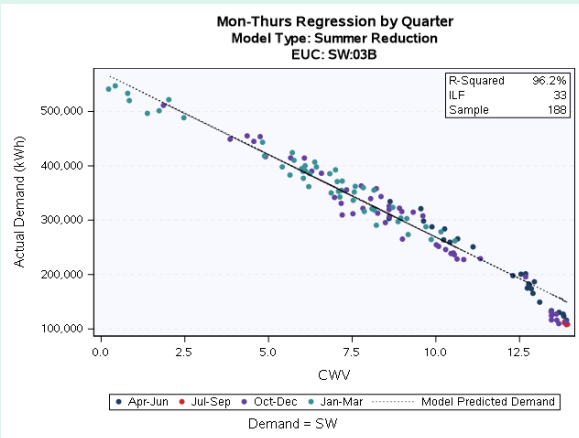
- Sample Grouping - Individual LDZ analysis
- Sample Sizes are good with only WN having a fairly low count (driven by a low population count)
- Previous 2 years used in average are 2021/22 and 2022/23
- R^2 values are similar to previous years with all values within 1.4% of previous results
- ILF values are lower than in previous years, suggesting an increase in weather sensitivity

LDZ	R^2		Sample Size	ILF	
	Avg. prev 2 years	2023/24	2023/24	Avg. prev 2 years	2023/24
SC	95.6%	↗ 96.6%	● 351	36.7	↓ 35.9
NO	97.0%	↘ 96.3%	● 182	39.9	↓ 38.0
NW	96.3%	↔ 96.3%	● 338	35.5	↓ 33.0
NE	96.8%	↘ 96.4%	● 192	35.7	↓ 33.3
EM	96.9%	↗ 97.1%	● 225	34.8	↓ 32.4
WM	96.6%	↗ 96.8%	● 224	34.0	↓ 33.1
WN	93.7%	↗ 95.0%	● 36	36.3	↓ 33.4
WS	96.1%	↘ 95.4%	● 124	35.8	↓ 30.6
EA	96.8%	↗ 97.1%	● 272	33.7	↓ 31.8
NT	96.9%	↘ 96.3%	● 327	36.4	↓ 35.8
SE	96.8%	↘ 96.5%	● 260	34.4	↓ 34.1
SO	96.3%	↘ 95.8%	● 225	32.6	↓ 30.0
SW	97.3%	↘ 96.2%	● 188	34.4	↓ 33.0

Results – Small NDM : 03B Selected LDZs

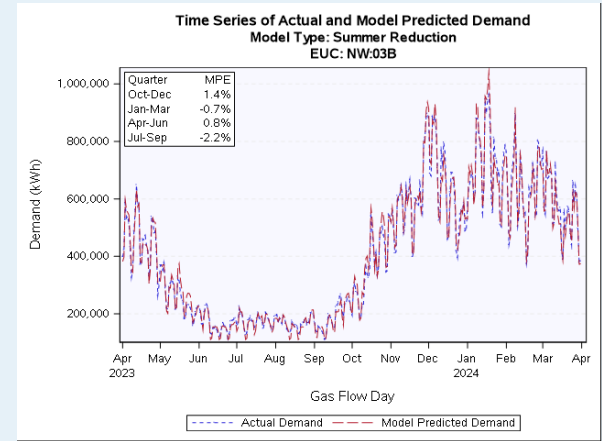
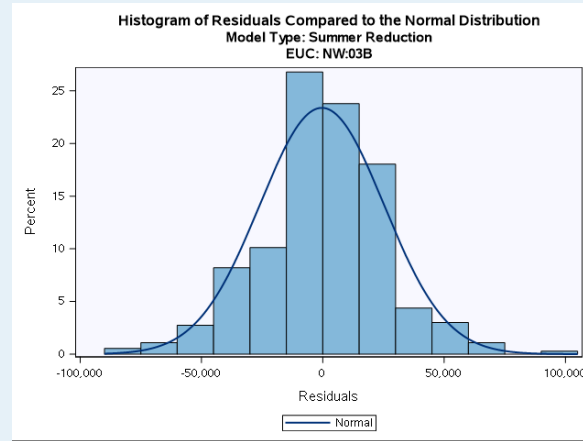
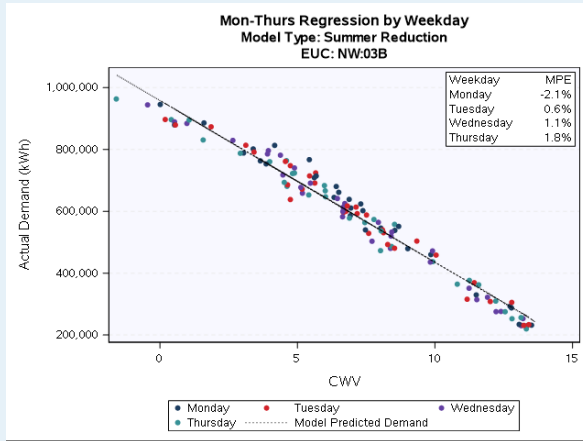


Selected LDZ

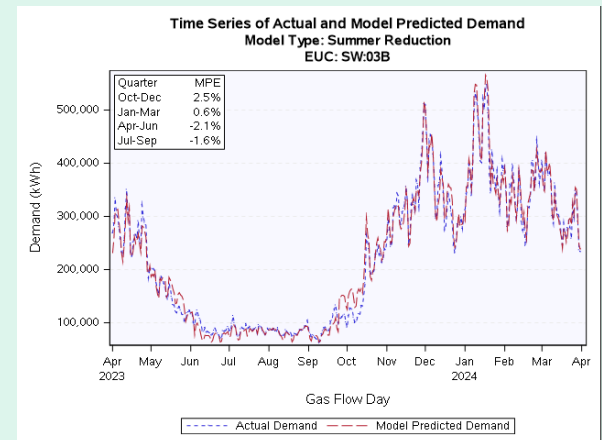
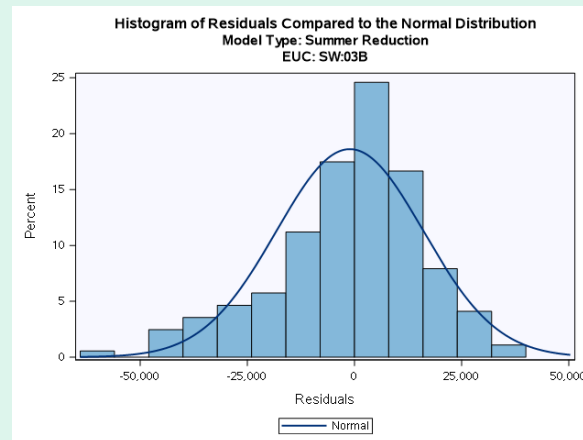
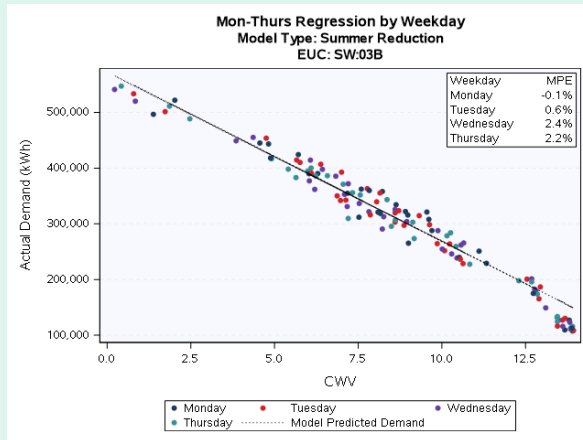


Selected LDZ

Results – Small NDM : 03B Selected LDZs



Selected LDZ



Selected LDZ

Results - Small NDM : 04B Summary

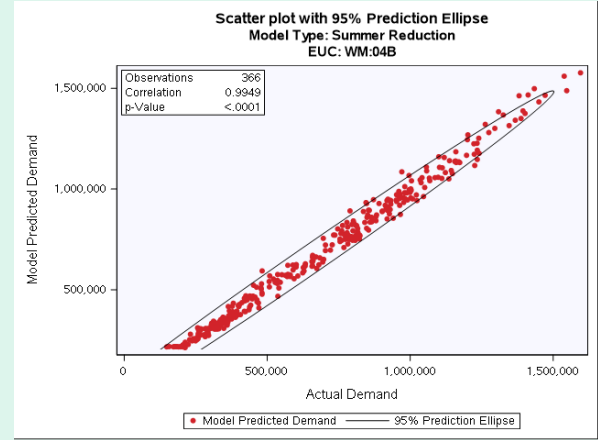
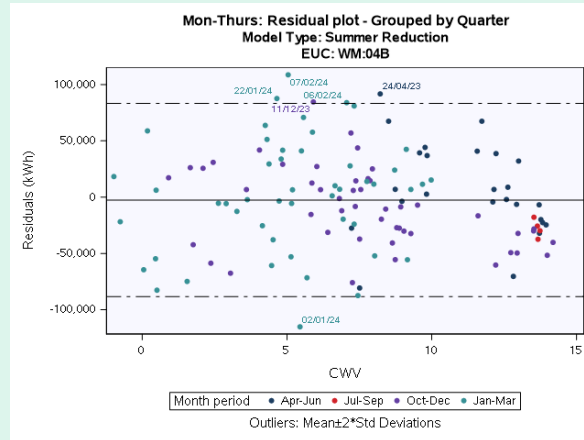
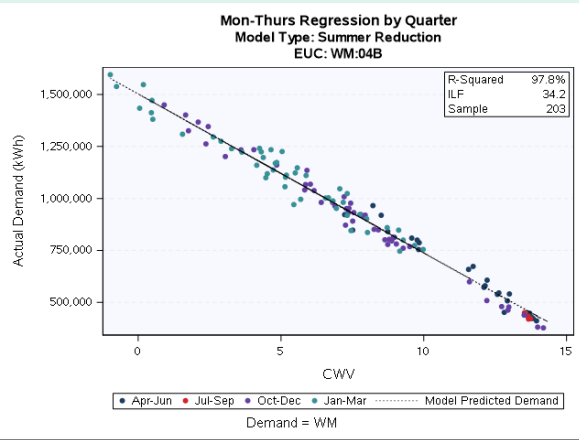
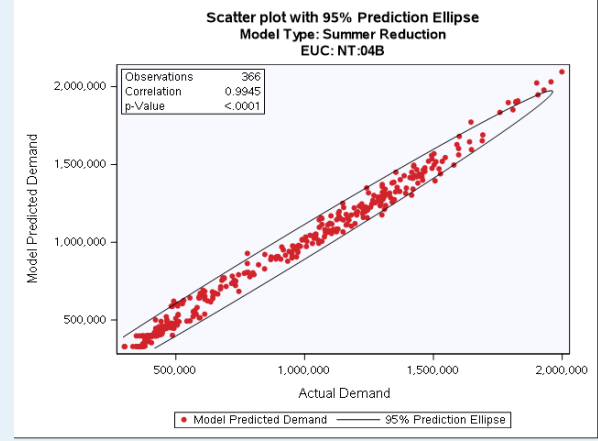
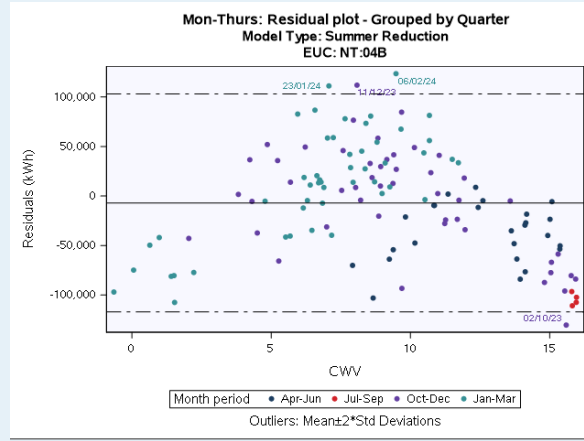
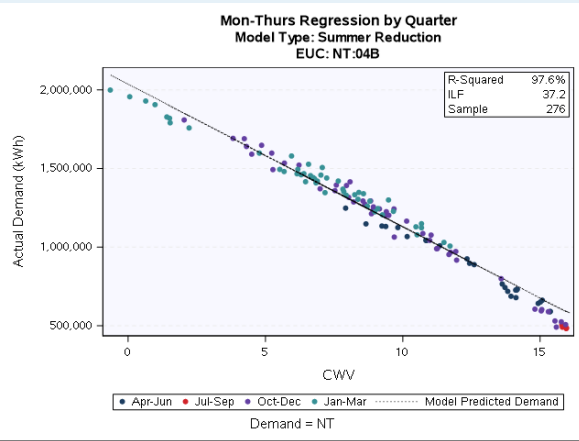
- Sample Grouping - Individual LDZ analysis
- Sample Sizes are good, with only WN having a fairly low count (driven by a low population)
- Previous 2 years used in average are 2021/22 and 2022/23
- R^2 values are similar to previous years with all values within 1.3% of previous results
- ILF values are generally lower than in previous years, suggesting an increase in weather sensitivity. Exceptions are SC and SO

LDZ	R^2		Sample Size	ILF	
	Avg. prev 2 years	2023/24	2023/24	Avg. prev 2 years	2023/24
SC	97.0%	↗ 97.3%	● 315	38.0	↑ 38.5
NO	97.3%	↘ 96.7%	● 189	39.0	↓ 36.4
NW	96.9%	↗ 97.7%	● 216	38.0	↓ 36.3
NE	97.0%	↘ 96.5%	● 257	36.5	↓ 34.3
EM	97.5%	↗ 98.2%	● 183	37.2	↓ 36.9
WM	96.7%	↗ 97.8%	● 203	35.2	↓ 34.2
WN	94.3%	↗ 94.7%	● 32	36.3	↓ 32.6
WS	95.7%	↗ 96.6%	● 104	35.9	↓ 35.5
EA	96.6%	↗ 97.8%	● 185	38.0	↓ 36.0
NT	97.3%	↗ 97.6%	● 276	39.0	↓ 37.2
SE	97.2%	↘ 97.0%	● 251	37.1	↓ 36.4
SO	97.1%	↘ 96.8%	● 213	32.8	↑ 33.9
SW	94.9%	↗ 96.0%	● 150	39.2	↓ 36.5

Results – Small NDM : 04B Selected LDZs

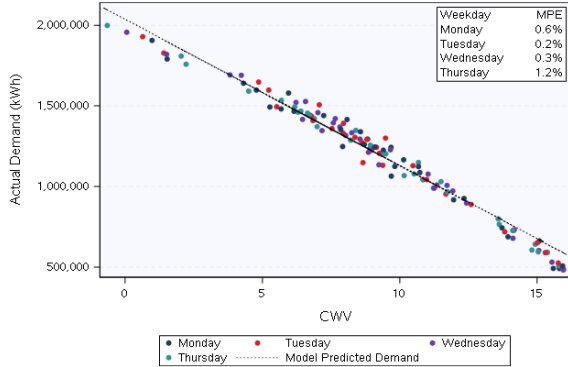
Selected LDZ

Selected LDZ

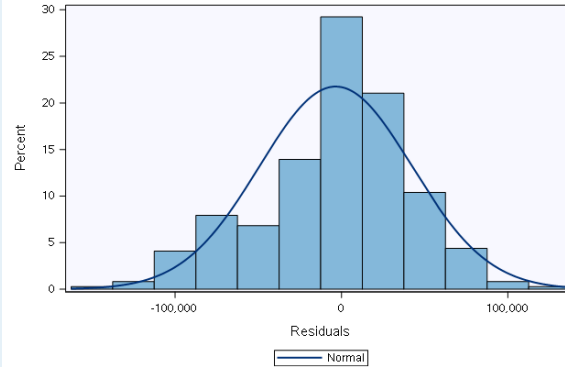


Results – Small NDM : 04B Selected LDZs

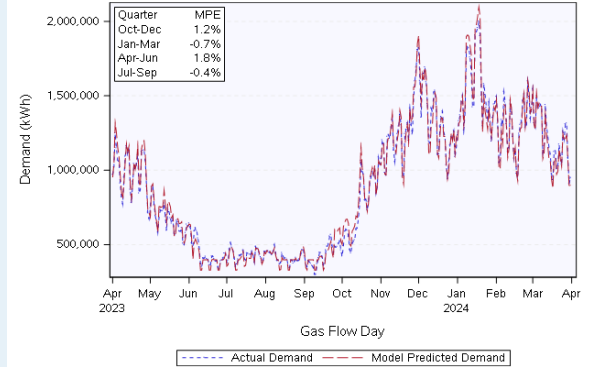
Mon-Thurs Regression by Weekday
Model Type: Summer Reduction
EUC: NT:04B



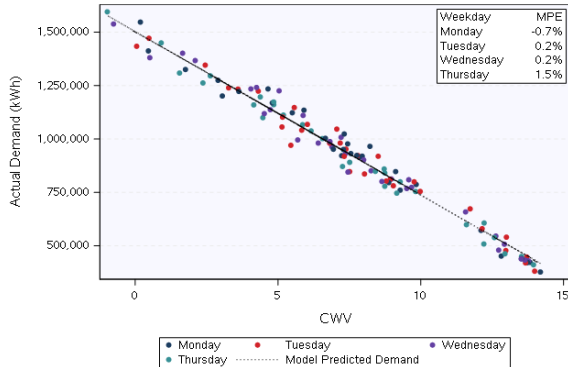
Histogram of Residuals Compared to the Normal Distribution
Model Type: Summer Reduction
EUC: NT:04B



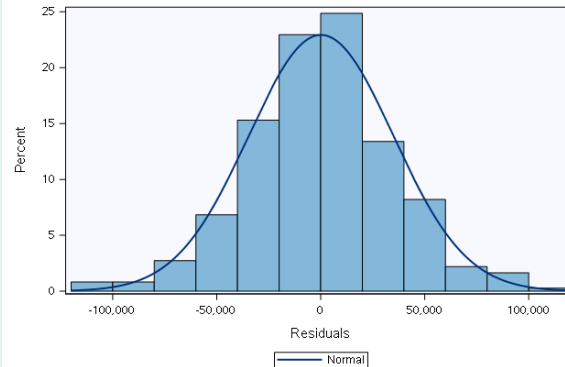
Time Series of Actual and Model Predicted Demand
Model Type: Summer Reduction
EUC: NT:04B



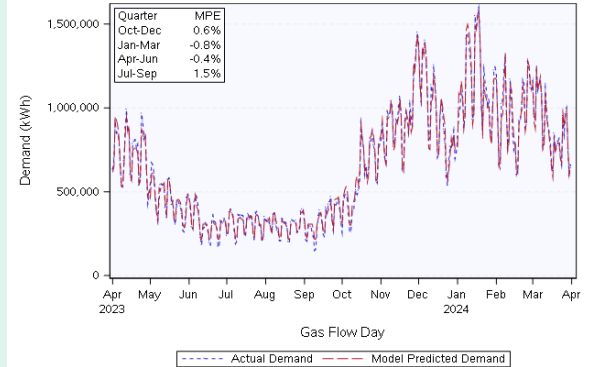
Mon-Thurs Regression by Weekday
Model Type: Summer Reduction
EUC: WM:04B



Histogram of Residuals Compared to the Normal Distribution
Model Type: Summer Reduction
EUC: WM:04B



Time Series of Actual and Model Predicted Demand
Model Type: Summer Reduction
EUC: WM:04B



Selected LDZ

Selected LDZ

Gas Demand EUC Modelling Results

SMALL NDM I&C EUC WAR BAND RESULTS

Small NDM: Agreed WAR Band Runs

Band / Range	Description	EUC	Modelling Runs
Band 3 293 to 732 MWh p.a.	Non-PPM I&C	03W01-04	Individual LDZs for most except NO (+NE), WN (+NW) and WS (+SW) and SC (+NO)* revised after the initial run
Band 4 732 to 2,196 MWh p.a.	Non-PPM I&C	04W01-04	Individual LDZs for most except WN (+NW) and WS (+SW)

Validated Supply Point Counts - Band 3 W01-04

LDZ	0.000 - 0.413	0.414 - 0.485	0.486 - 0.575	0.576 - 1.000	Total
SC	35	117	158	41	351
NO	44	64	53	21	182
NW	66	103	94	75	338
NE	45	53	41	53	192
EM	38	64	63	60	225
WM	49	67	68	40	224
WN	8	8	12	8	36
WS	21	34	41	28	124
EA	49	81	76	66	272
NT	83	87	101	56	327
SE	61	76	66	57	260
SO	51	72	48	54	225
SW	36	59	54	39	188
Total	586	885	875	598	2944
%	19.9%	30.1%	29.7%	20.3%	100.0%
Target	20.0%	30.0%	30.0%	20.0%	

Validated Supply Point Counts - Band 4 W01-04

LDZ	0.000 - 0.403	0.404 - 0.469	0.470 - 0.560	0.561 - 1.000	Total
SC	44	103	121	47	315
NO	30	63	58	38	189
NW	45	61	63	47	216
NE	45	69	65	78	257
EM	38	52	58	35	183
WM	47	55	56	45	203
WN	6	6	12	8	32
WS	25	37	23	20	105
EA	33	63	54	35	185
NT	74	65	82	55	276
SE	50	85	73	43	251
SO	45	67	62	39	213
SW	35	50	42	23	150
Total	517	776	769	513	2575
%	20.1%	30.1%	29.9%	19.9%	100.0%
Target	20.0%	30.0%	30.0%	20.0%	

Results – Small NDM: 03W01-04 Summary

LDZ	03W01 (0 to 0.413)				03W02 (0.414 to 0.485)				03W03 (0.486 to 0.575)				03W04 (0.576 to 1)			
	R ²	Sample Size	ILF		R ²	Sample Size	ILF		R ²	Sample Size	ILF		R ²	Sample Size	ILF	
SC	↑ 81.2%	● 79	↑ 64.6	↗ 97.3%	● 181	↑ 43.6	↗ 95.5%	● 211	↑ 30.6	↗ 95.0%	● 62	↑ 23.7				
NO	↗ 88.6%	● 89	↑ 62.3	↗ 97.8%	● 117	↑ 44.7	↘ 95.4%	● 94	↓ 31.3	↘ 91.5%	● 74	↓ 22.9				
NW	↑ 91.9%	● 66	↑ 61	↗ 97.3%	● 103	↑ 44.1	↘ 94.4%	● 94	↓ 28	↘ 91.9%	● 75	↓ 21.7				
NE	↗ 88.4%	● 45	↑ 59.7	↗ 97.6%	● 53	↑ 44.2	↗ 96.0%	● 41	↑ 30.5	↘ 91.3%	● 53	↓ 21.9				
EM	↓ 75.6%	● 38	↓ 64.5	↗ 96.4%	● 64	↑ 42.4	↘ 96.0%	● 63	↓ 30.9	↘ 93.3%	● 60	↓ 21.6				
WM	↓ 79.3%	● 49	↓ 57.3	↑ 98.1%	● 67	↑ 41.4	↓ 93.7%	● 68	↓ 27.7	↘ 92.0%	● 40	↓ 21.9				
WN	↑ 91.8%	● 74	↑ 62.1	↗ 97.0%	● 111	↑ 44.7	↘ 94.3%	● 106	↓ 28.6	↘ 93.2%	● 83	↓ 21.9				
WS	↑ 84.8%	● 57	↑ 58.6	↑ 96.7%	● 93	↑ 41.8	↘ 94.9%	● 95	↓ 28.3	↗ 94.3%	● 67	↑ 21.8				
EA	↑ 88.0%	● 49	↑ 58.6	↗ 94.2%	● 81	↑ 40.4	↘ 95.4%	● 76	↓ 28.2	↘ 93.4%	● 66	↓ 22.2				
NT	↓ 74.9%	● 83	↓ 69.1	↗ 93.9%	● 87	↑ 42.1	↗ 96.0%	● 101	↑ 29.8	↓ 89.8%	● 56	↓ 23.1				
SE	↓ 75.8%	● 61	↓ 63.6	↗ 95.3%	● 76	↑ 43.3	↘ 96.1%	● 66	↓ 28.8	↓ 90.1%	● 57	↓ 21.6				
SO	↗ 81.0%	● 51	↑ 59.2	↗ 95.1%	● 72	↑ 38.3	↘ 94.8%	● 48	↓ 28	↓ 90.4%	● 54	↓ 18				
SW	↑ 84.0%	● 36	↑ 60.4	↗ 94.1%	● 59	↑ 42.4	↘ 94.6%	● 54	↓ 29.4	↘ 93.8%	● 39	↓ 22				

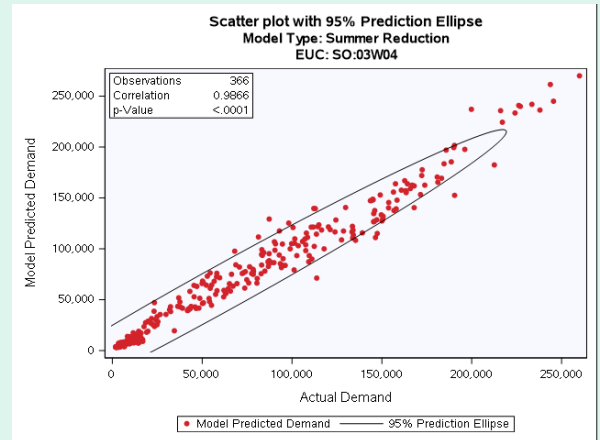
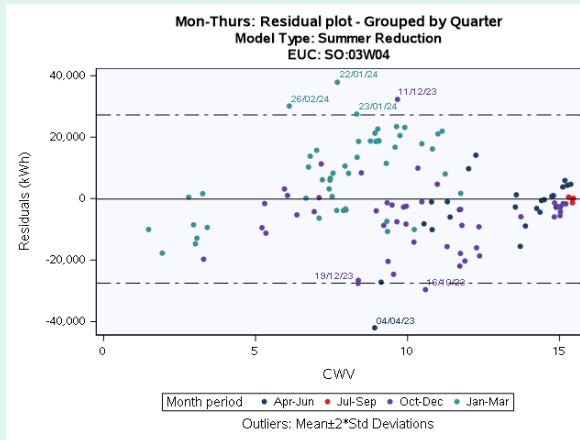
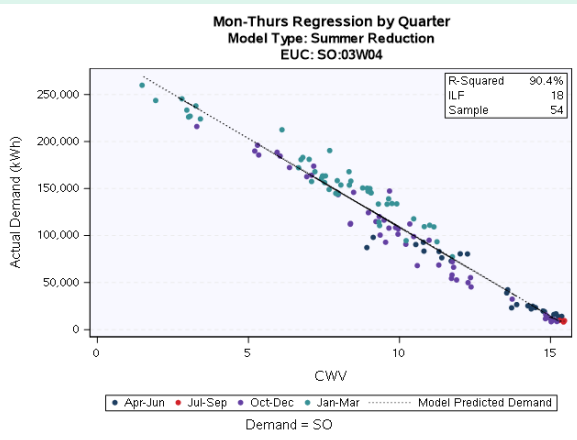
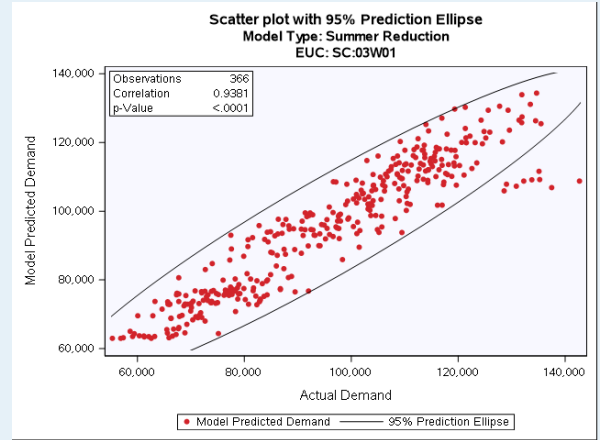
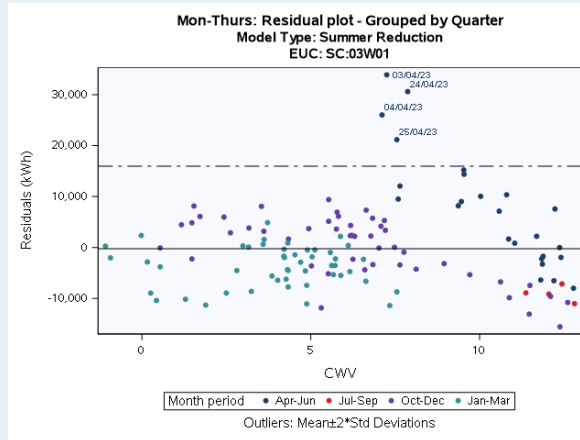
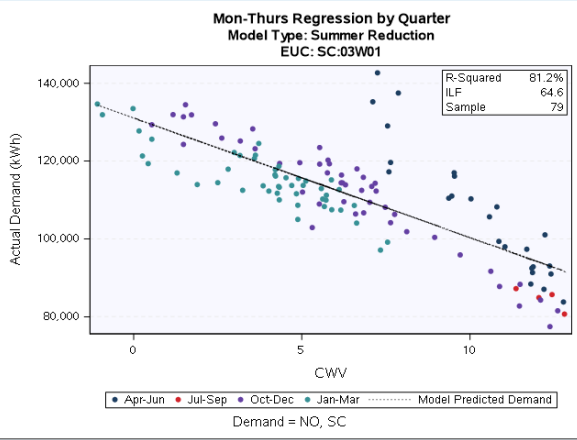
Results - Small NDM : 03W01-04 Summary

- Sample Grouping - Individual LDZs for all except NO (+NE), WN (+NW) and WS (+SW) and SC (+NO)
 - SC was originally modelled at individual LDZ but was revised after the initial run due to poor results
- Previous 2 years used in average are 2021/22 and 2022/23
- WAR Band 01 has seen the biggest changes in R^2 values with movements between -11.3% for WM and +13.2% for SW
- The other WAR Bands have much smaller changes in R^2 values with all changes within +/- 6% and the average change -0.3%
- ILF values are generally up for WAR Bands 01 and 02 whilst 03 and 04 are generally lower than in previous years, as we have seen in other EUCs
 - There is still a clear separation in ILF values between WAR Bands
 - Movements are in a range of -6.70 (W01 SW) to +2.65 (W01 EM)

Results – Small NDM : 03W01-04 Selected LDZs

Selected LDZ W01

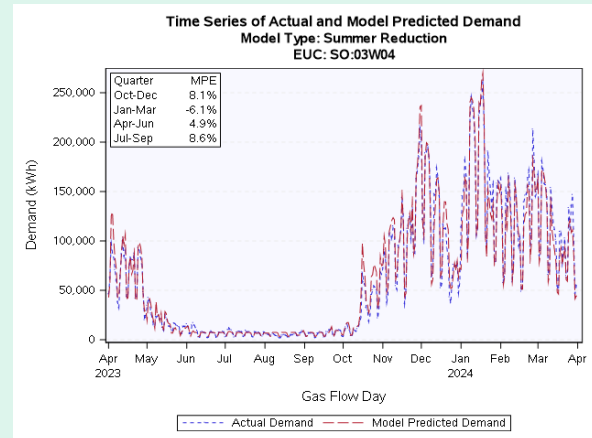
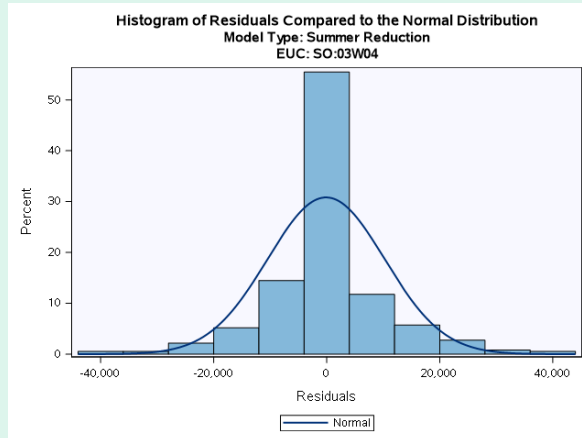
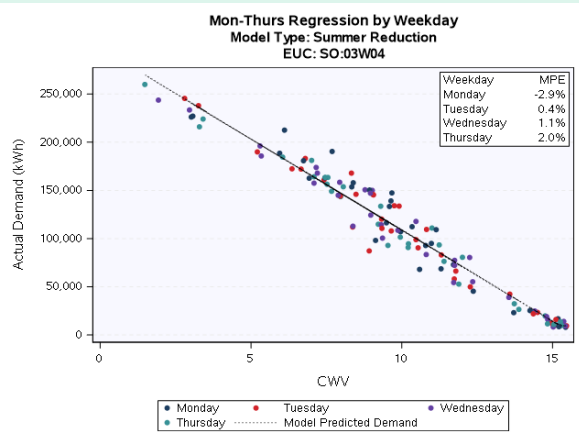
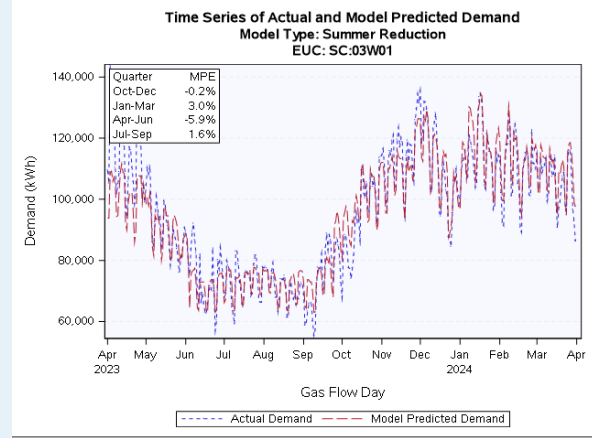
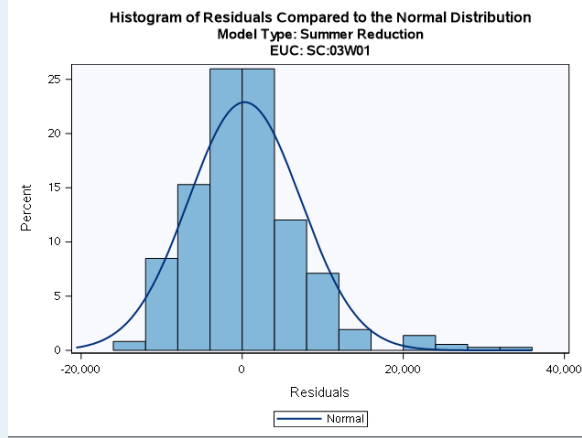
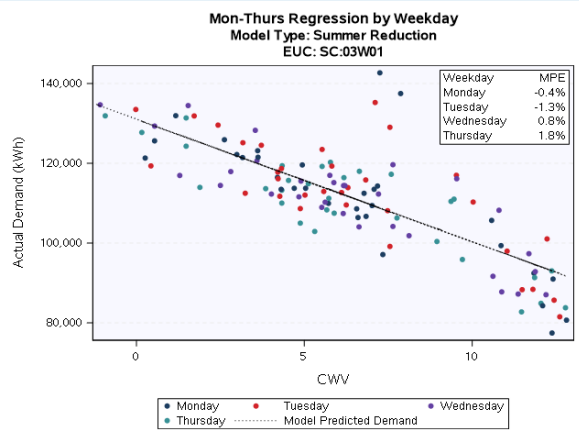
Selected LDZ W04



Results – Small NDM : 03W01-04 Selected LDZs

Selected LDZ W01

Selected LDZ W04



Results – Small NDM: 04W01-04 Summary

LDZ	04W01 (0 to 0.403)				04W02 (0.404 to 0.469)				04W03 (0.47 to 0.56)				04W04 (0.561 to 1)			
	R ²	Sample Size	ILF		R ²	Sample Size	ILF		R ²	Sample Size	ILF		R ²	Sample Size	ILF	
SC	↓ 90.2%	● 44	↓ 63.2	↘ 95.6%	● 103	↓ 47.2	↗ 96.2%	● 121	↑ 33.6	↑ 96.3%	● 47	↑ 26.2				
NO	↓ 87.5%	● 30	↓ 63.8	↗ 96.7%	● 63	↑ 45.5	↘ 95.7%	● 58	↓ 33.1	↘ 90.8%	● 38	↓ 23.1				
NW	↑ 94.0%	● 45	↑ 61.0	↑ 96.6%	● 61	↑ 43.8	↗ 97.3%	● 63	↑ 32.5	↘ 93.5%	● 47	↓ 24.0				
NE	↘ 91.1%	● 45	↓ 63.2	↘ 96.4%	● 69	↓ 46.8	↗ 96.2%	● 65	↑ 32.3	↓ 91.7%	● 78	↓ 22.6				
EM	↑ 92.9%	● 38	↑ 63.7	↗ 95.4%	● 52	↑ 44.9	↗ 98.3%	● 58	↑ 32.9	↘ 94.6%	● 35	↓ 23.3				
WM	↑ 91.0%	● 47	↑ 53.7	↗ 95.9%	● 55	↑ 42.2	↗ 96.7%	● 56	↑ 31.0	↘ 94.0%	● 45	↓ 22.0				
WN	↑ 94.3%	● 51	↑ 61.2	↑ 96.7%	● 67	↑ 44.6	↗ 97.3%	● 75	↑ 33.0	↘ 94.0%	● 55	↓ 23.8				
WS	↓ 83.6%	● 60	↓ 59.6	↗ 95.0%	● 86	↑ 43.6	↗ 95.7%	● 65	↑ 30.9	↗ 93.5%	● 43	↑ 22.5				
EA	↑ 90.3%	● 33	↑ 59.7	↑ 95.1%	● 63	↑ 43.8	↗ 97.1%	● 54	↑ 33.0	↓ 91.7%	● 35	↓ 22.5				
NT	↑ 89.6%	● 74	↑ 59.3	↗ 96.3%	● 65	↑ 45.6	↗ 96.9%	● 82	↑ 33.0	↓ 87.5%	● 55	↓ 24.0				
SE	↗ 83.4%	● 50	↑ 60.5	↗ 94.8%	● 85	↑ 44.1	↗ 96.4%	● 73	↑ 32.0	↓ 87.9%	● 43	↓ 23.0				
SO	↑ 83.6%	● 45	↑ 61.1	↘ 93.1%	● 67	↓ 39.2	↗ 96.5%	● 62	↑ 30.3	↗ 94.8%	● 39	↑ 21.7				
SW	↑ 81.2%	● 35	↑ 59.1	↗ 91.9%	● 50	↑ 44.4	↗ 95.7%	● 42	↑ 30.7	↘ 93.9%	● 23	↓ 22.0				

Results - Small NDM : 04W01-04 Summary

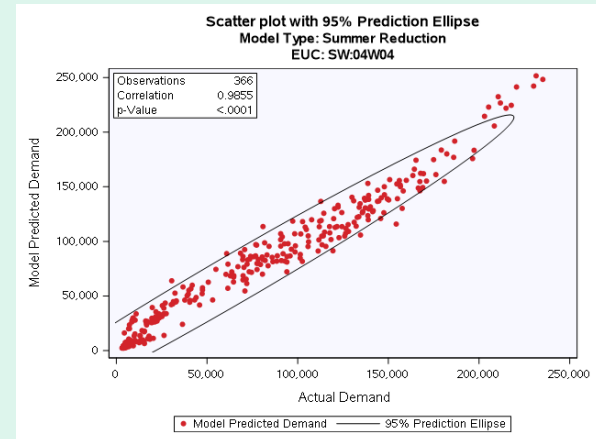
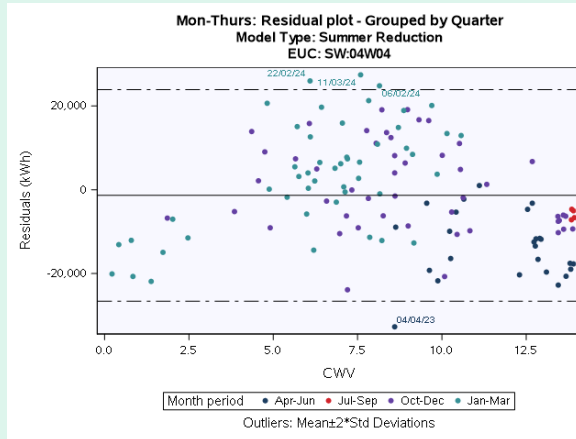
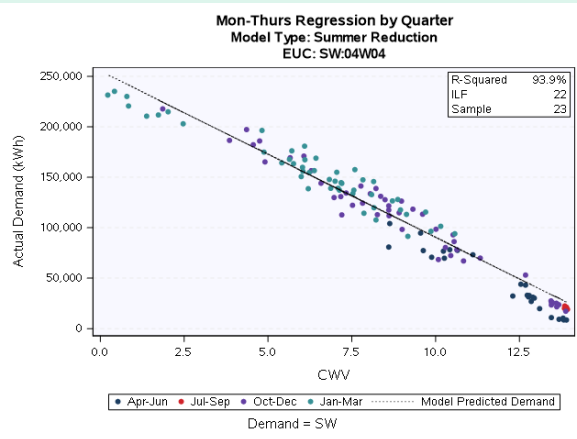
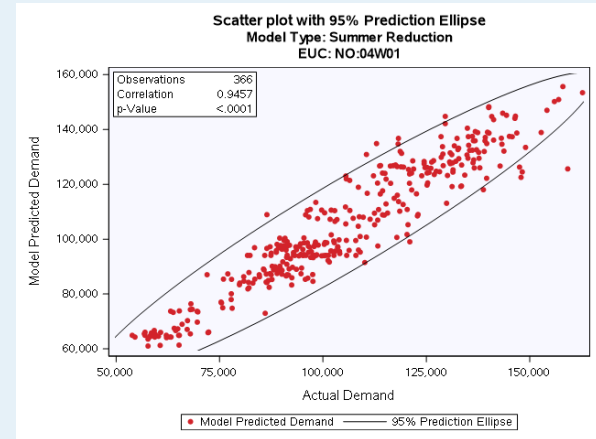
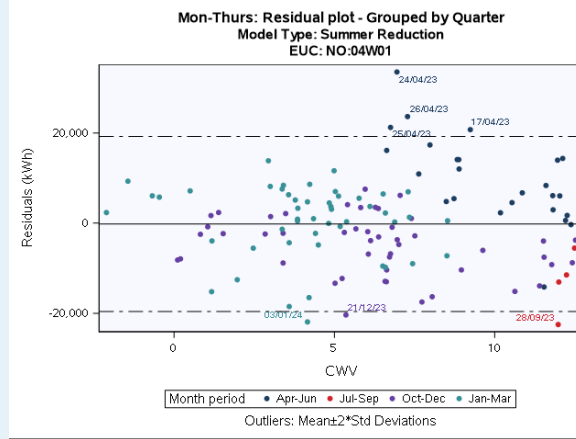
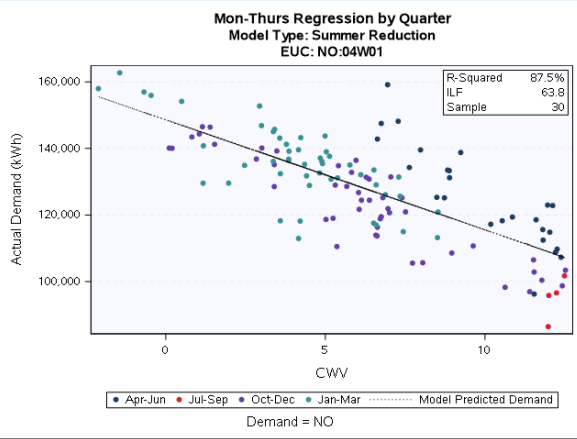
- Sample Grouping - Individual LDZs for all except WN (+NW) and WS (+SW)
- Previous 2 years used in average are 2021/22 and 2022/23
- WAR Band 01 has seen the biggest changes in R^2 values with movements between -5.2% for NO and +10.6% for SW
- The other WAR Bands have generally smaller changes in R^2 values with all changes within -8.5% and +3.7%
- The average change in R^2 values is 0.8% for W01-04
- ILF values are generally lower for WAR Bands 01-03 whilst 04 ILFs are generally lower than in previous years
 - Movements are in a range of -7.80 (W01 WM) to +4.95 (W01 EM)
- In almost all LDZs in WAR Band 04 we are seeing a large positive MPE April to July
 - We believe this is a result of energy conservation at the beginning of the period and not errors in the sample data
 - The model will forecast a 'normal' consumption, and therefore we do not recommend removing any data from the sample

Results – Small NDM : 04W01-04 Selected LDZs

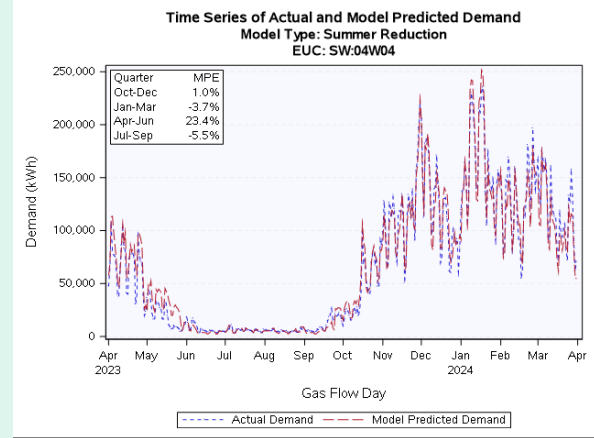
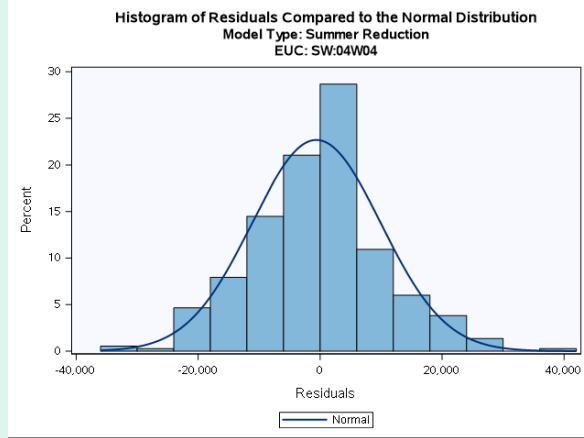
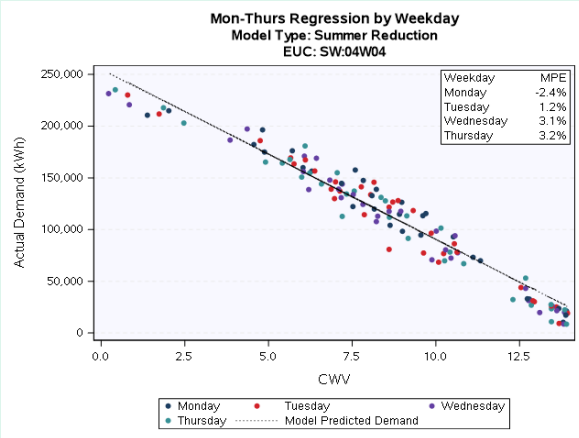
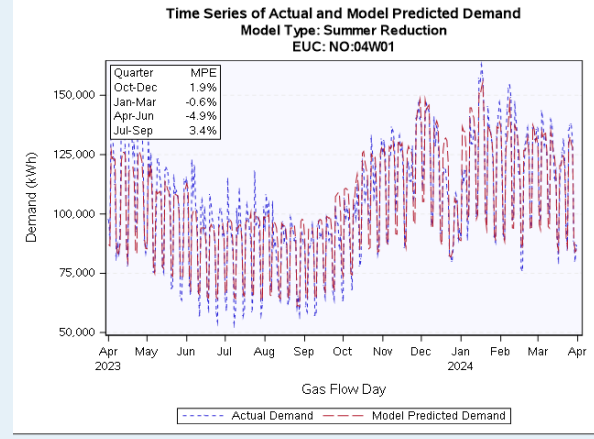
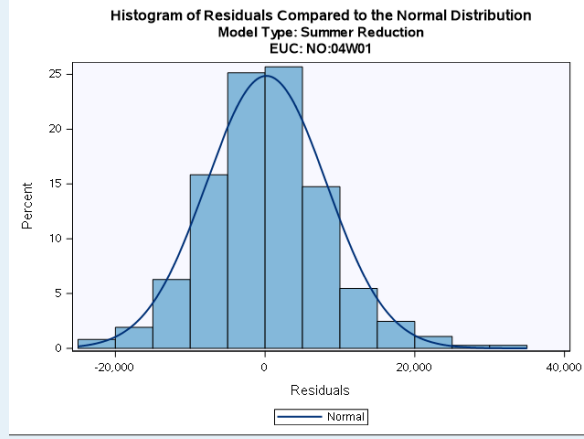
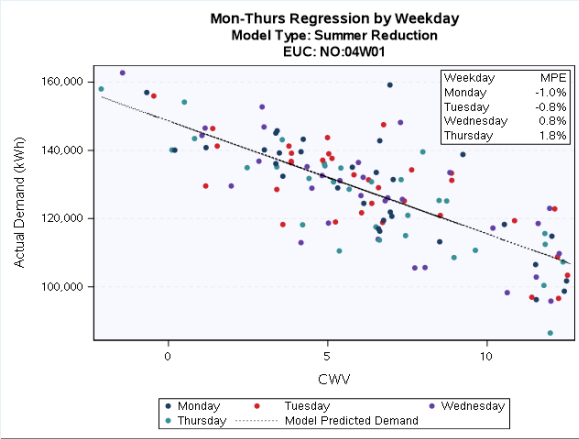
Selected LDZ W01

Selected LDZ W04

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Results – Small NDM : 04W01-04 Selected LDZs



Conclusions

- All Small NDM models have seen changes to ILFs as a result of changes to customer behaviour – generally these are now lower than previously
- R^2 values are better or in line with previous years' results for Consumption Band and WAR Band modelling
- All models have produced good results that can be carried forward into model smoothing