Results

MAPE Cross validation results of remainders cycle1, cycle2, and cycle3 (part b)

```
##                  [,1]      [,2]       [,3]
## Window LOOCV 0.7303158 0.899521 0.6977499
## 12 step       0.9804064 1.383797 0.9397779
```

Reject null hypothesis that Gas prices are not granger caused by Electricity prices (part m)

```
## Granger causality test
##
## Model 1: VAR_elecp ~ Lags(VAR_elecp, 1:5) + Lags(gasp, 1:5)
## Model 2: VAR_elecp ~ Lags(VAR_elecp, 1:5)
##   Res.Df Df      F Pr(>F)
## 1    407
## 2    412 -5 0.1557 0.9783

## Granger causality test
##
## Model 1: gasp ~ Lags(gasp, 1:5) + Lags(VAR_elecp, 1:5)
## Model 2: gasp ~ Lags(gasp, 1:5)
##   Res.Df Df      F  Pr(>F)
## 1    407
## 2    412 -5 2.7347 0.01913 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

MAPE Testing results model comparisons (part n)

```
##        Mod1   Auto Arima         ETS Holt-Winters  Combination
VAR
##    0.2414583   0.7152450   0.8705170   0.4591887   0.5515894
0.7158291
```

Forward 2020 forecasts from February (part h)

```
##              Jan       Feb       Mar       Apr       May       Jun       Jul
## 2020            0.1340804 0.1336859 0.1333080 0.1345800 0.1382781 0.1387831
## 2021 0.1331084
##              Aug       Sep       Oct       Nov       Dec
## 2020 0.1381448 0.1378254 0.1343304 0.1322127 0.1324894
## 2021
```

Forward 2020 forecasts from February (part o)

```
##              T+1       T+2       T+3       T+4       T+5       T+6
T+7
## Jan 2020 0.13449 0.1345337 0.1342449 0.1343771 0.1346522 0.1353342
0.1356824
##              T+8       T+9      T+10     T+11      T+12
## Jan 2020 0.1357321 0.13568 0.1356688 0.13613 0.1365623
```