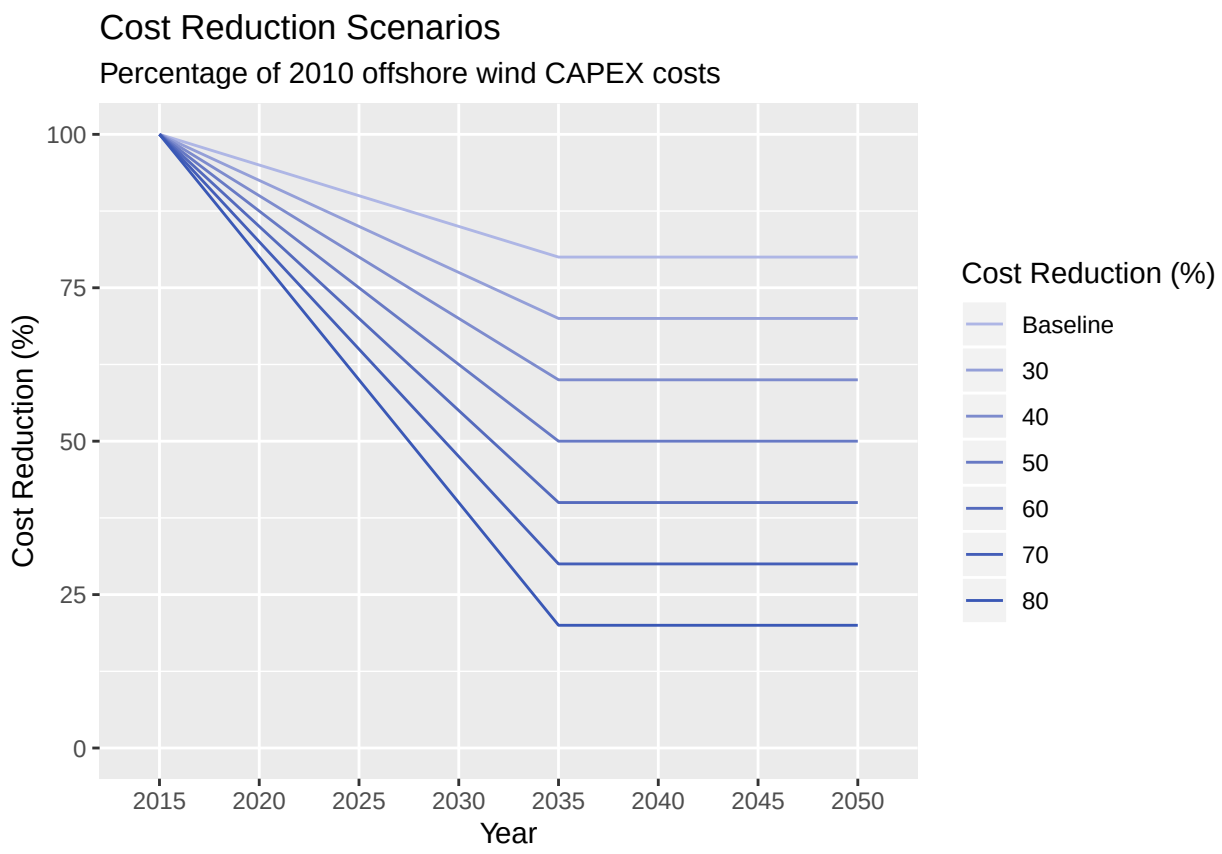
Offshore_Wind_Results_Processing.R

MBrownin

2019-07-16

```
rm(list = ls())
```

```
## Saving 6.5 x 4.5 in image
```




```
## Saving 6.5 x 4.5 in image
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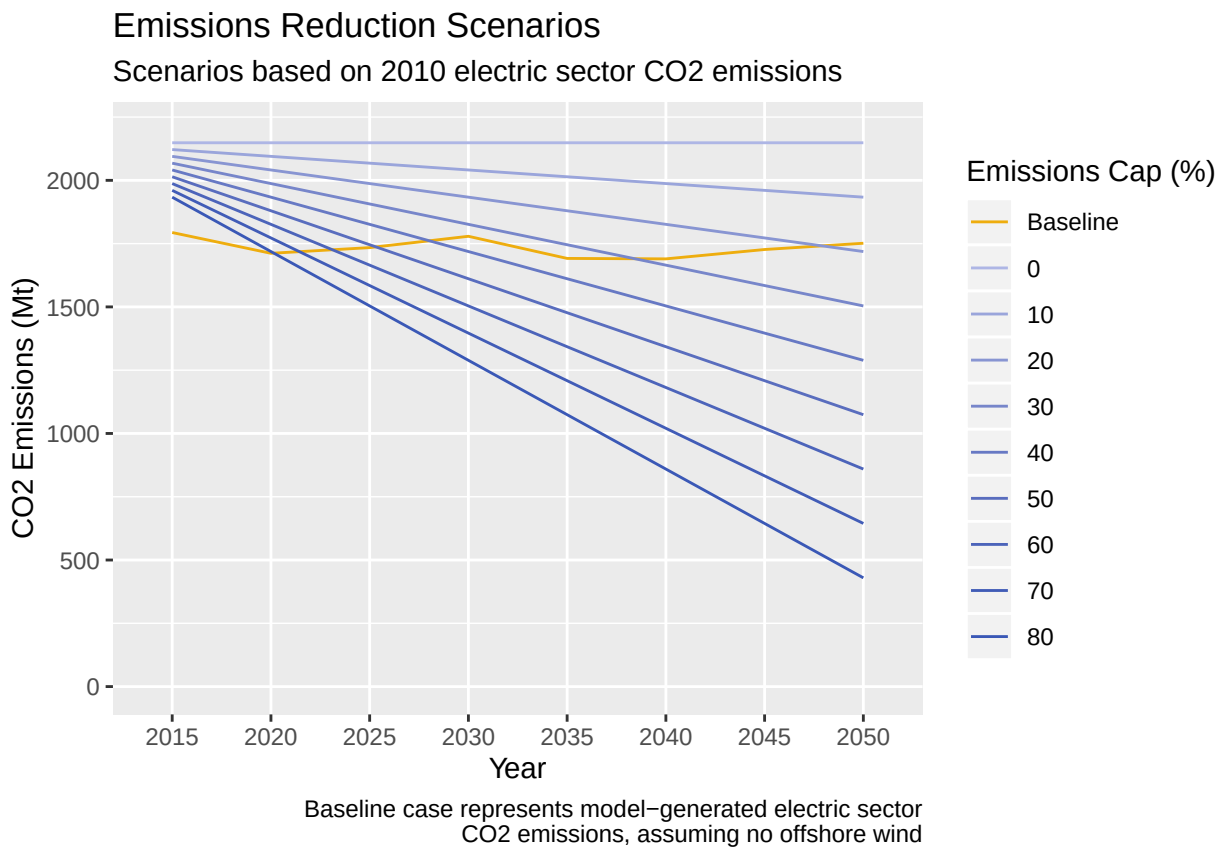


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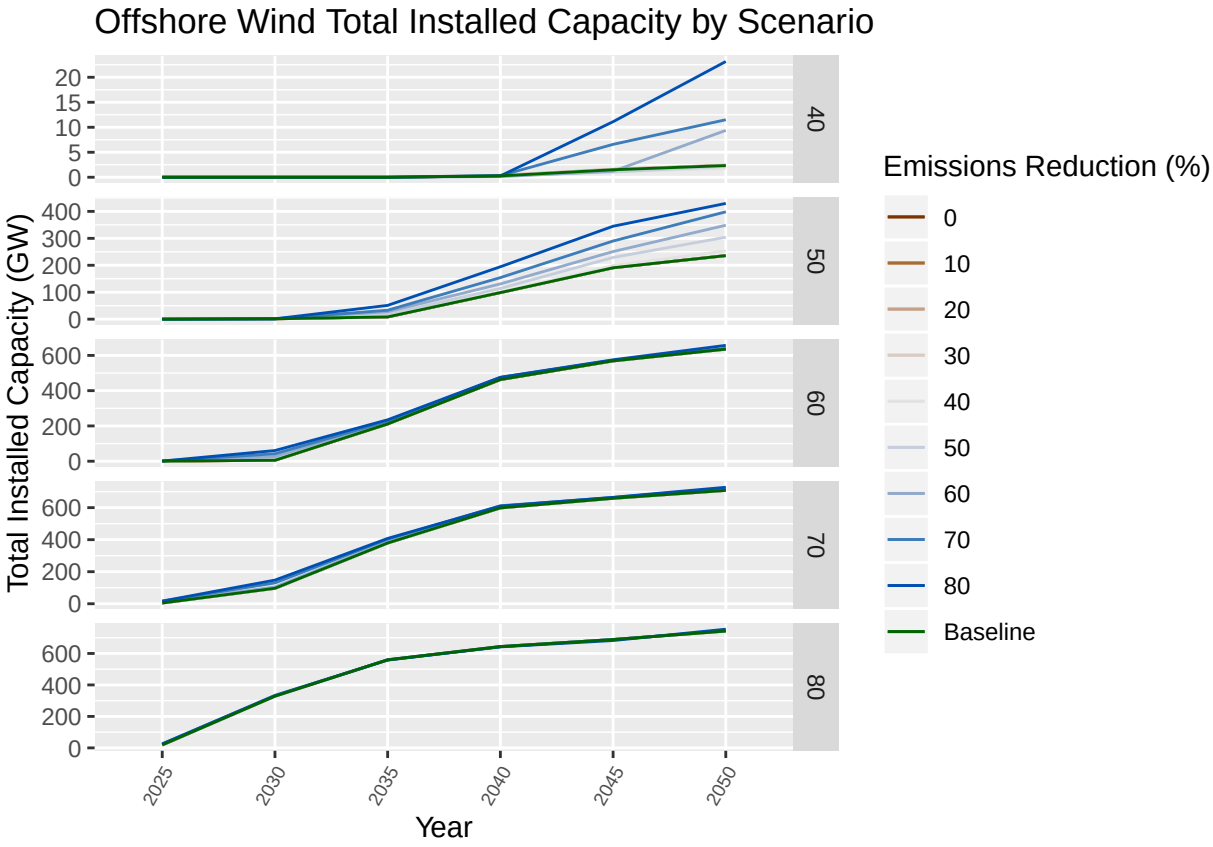
## Saving 6.5 x 4.5 in image
```




```
## Saving 6.5 x 4.5 in image
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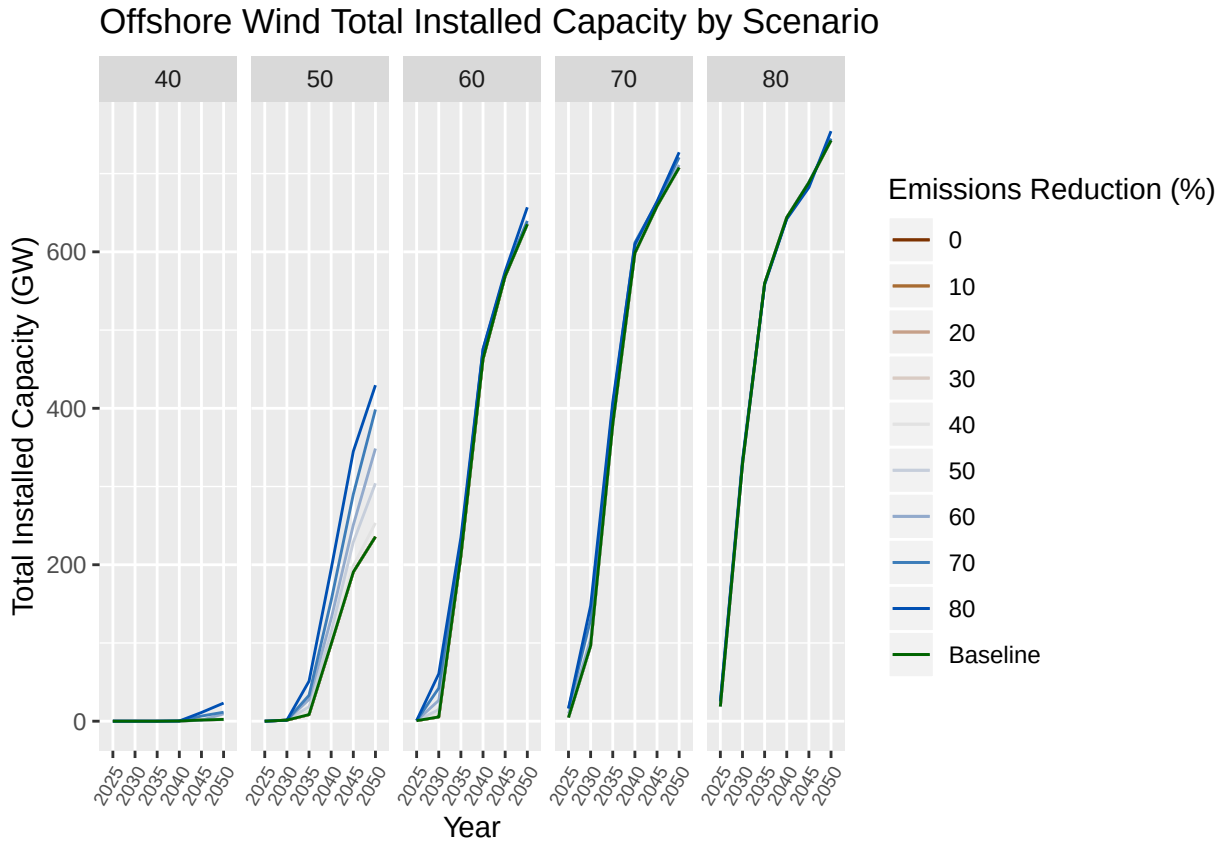


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## Saving 6.5 x 4.5 in image
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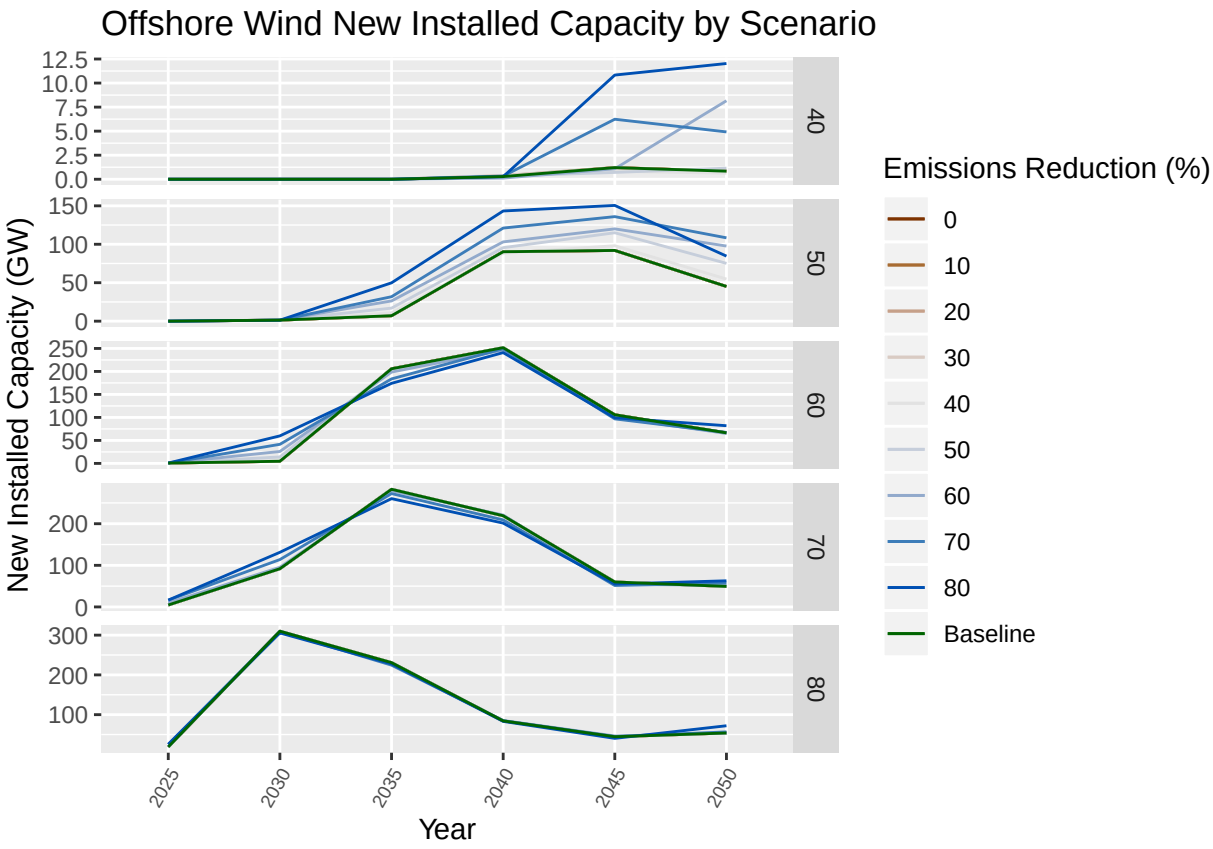
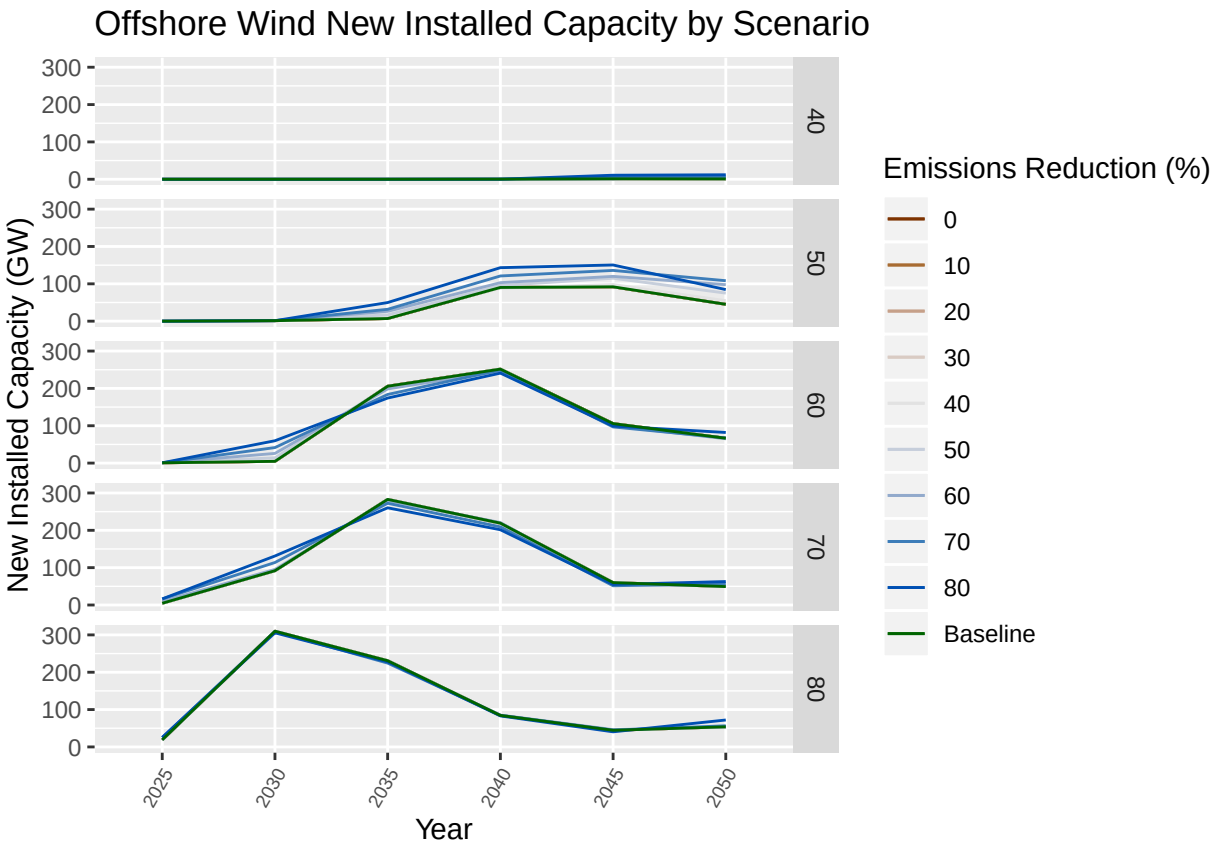
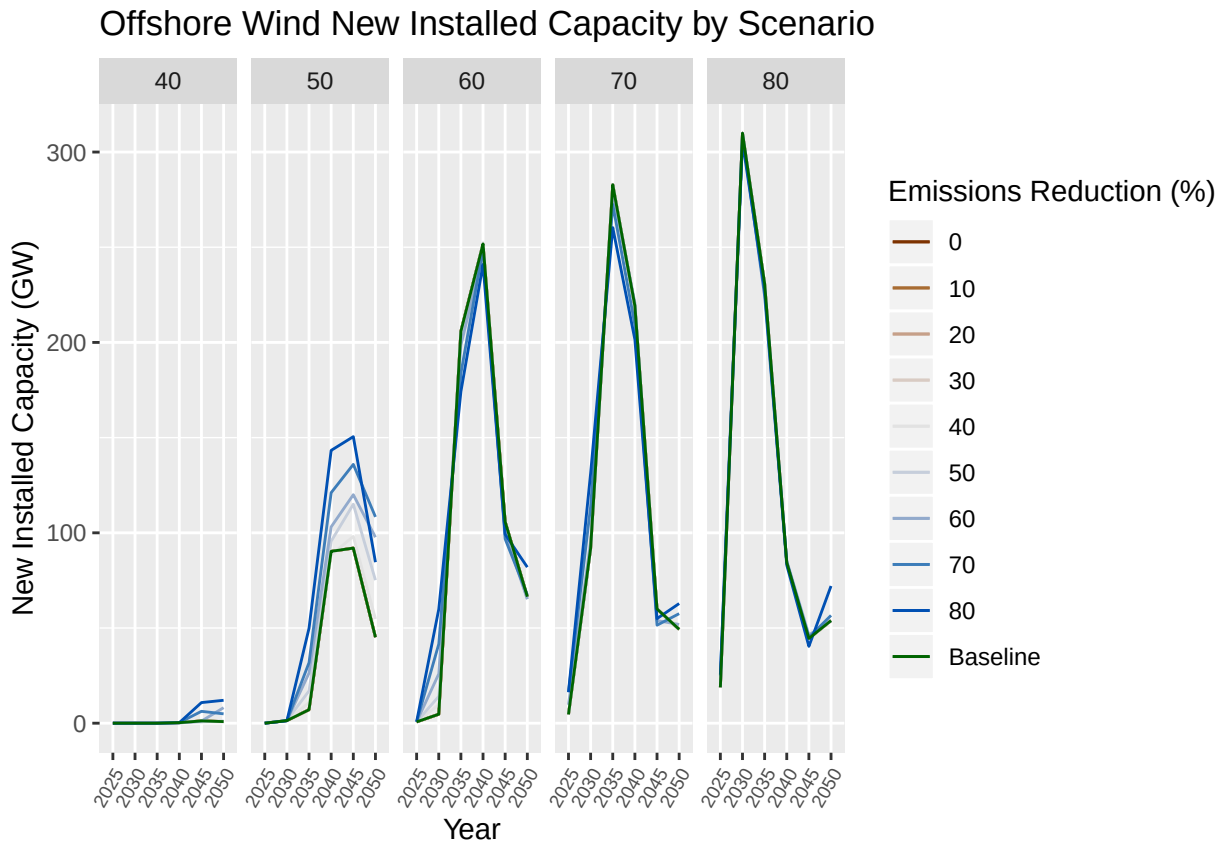


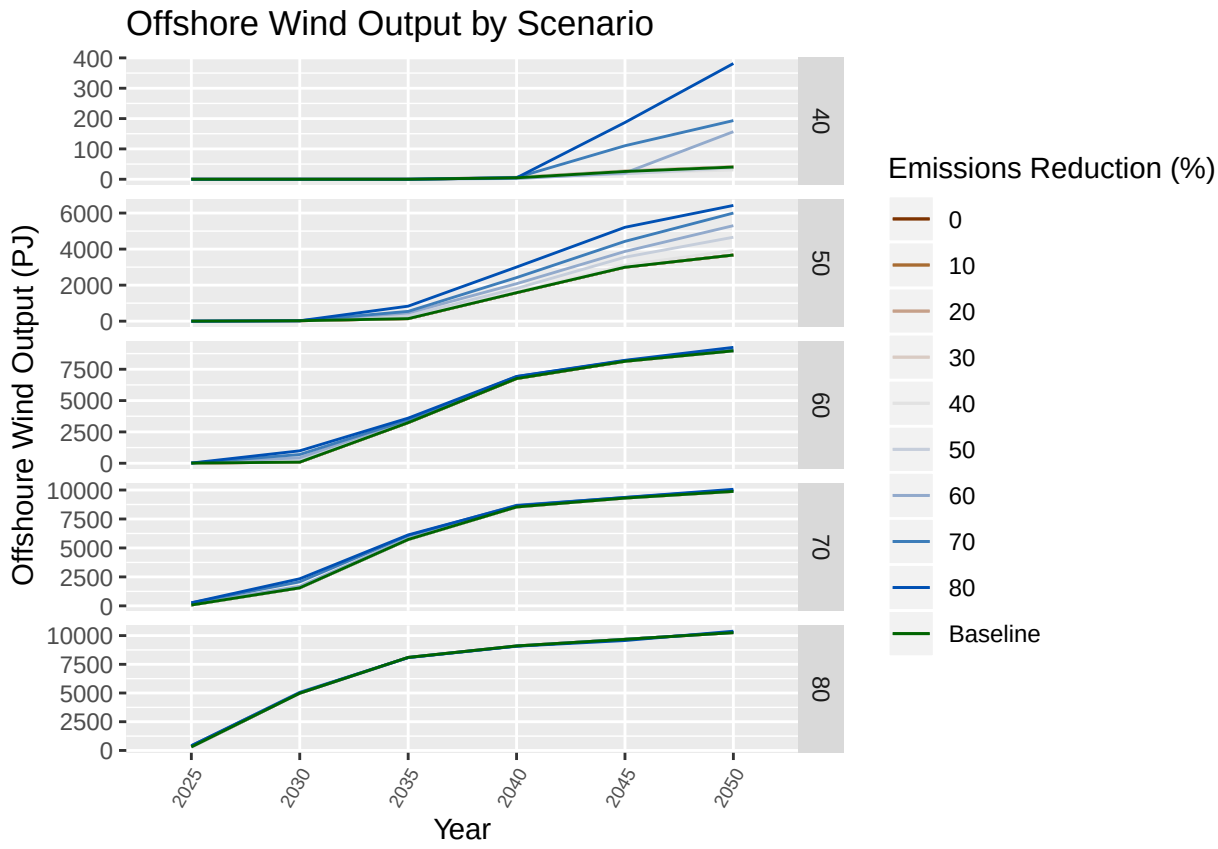

```
## Saving 6.5 x 4.5 in image
```




```
## Saving 6.5 x 4.5 in image
```




```
## Saving 6.5 x 4.5 in image
```

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## Saving 6.5 x 4.5 in image
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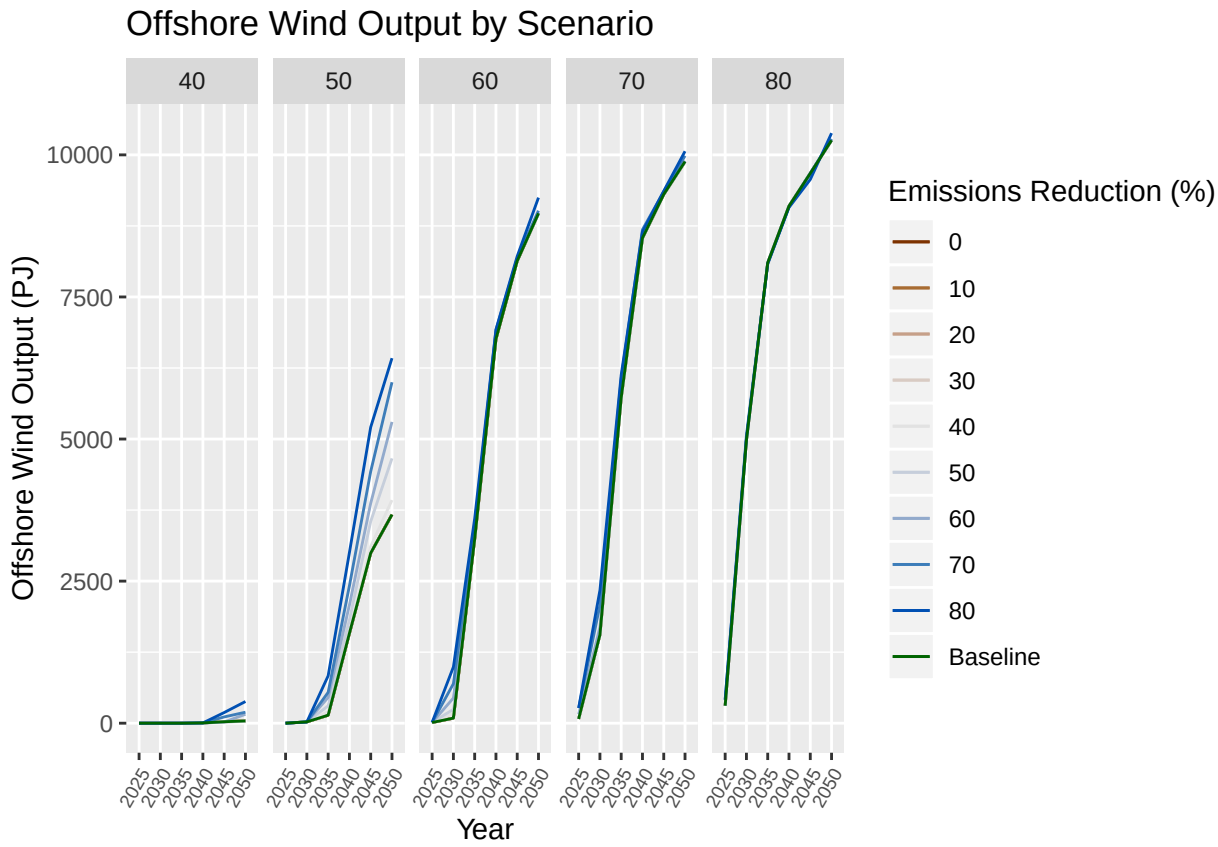


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## Saving 6.5 x 4.5 in image
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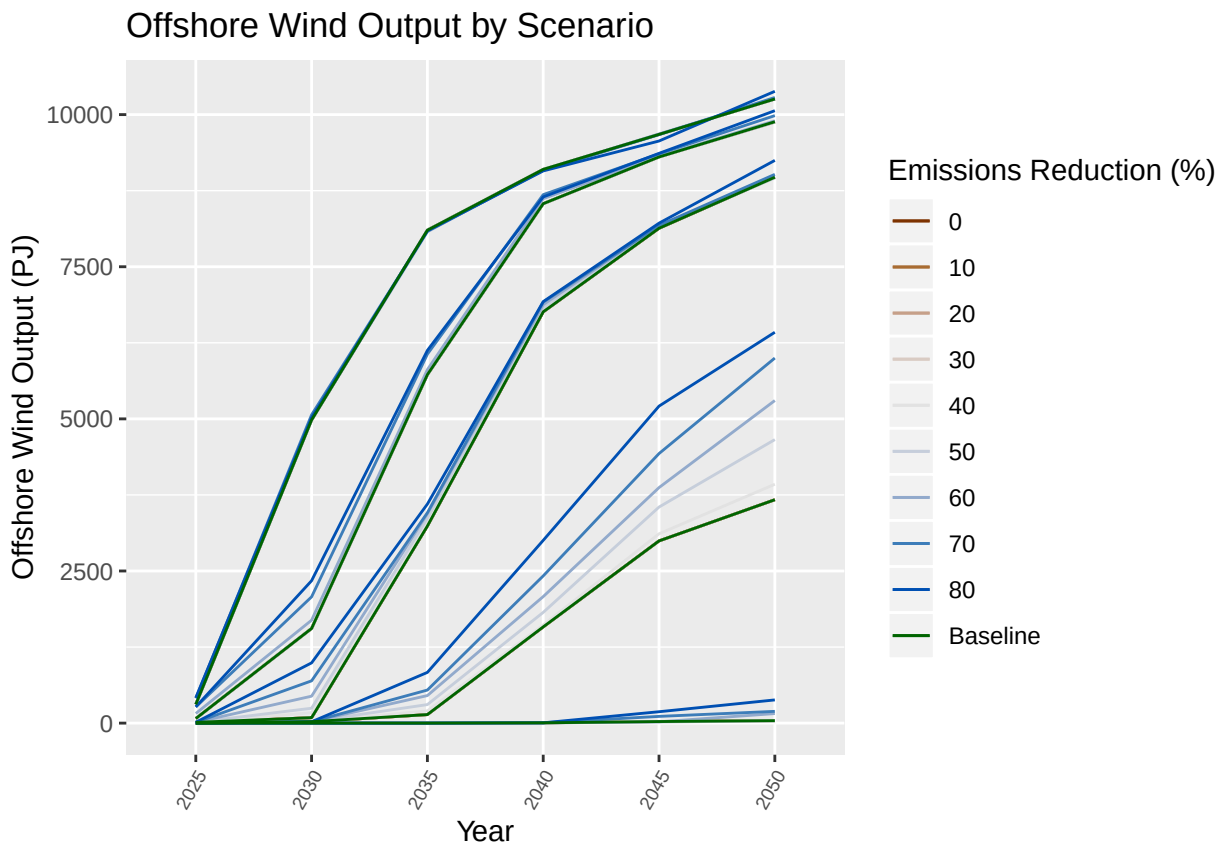
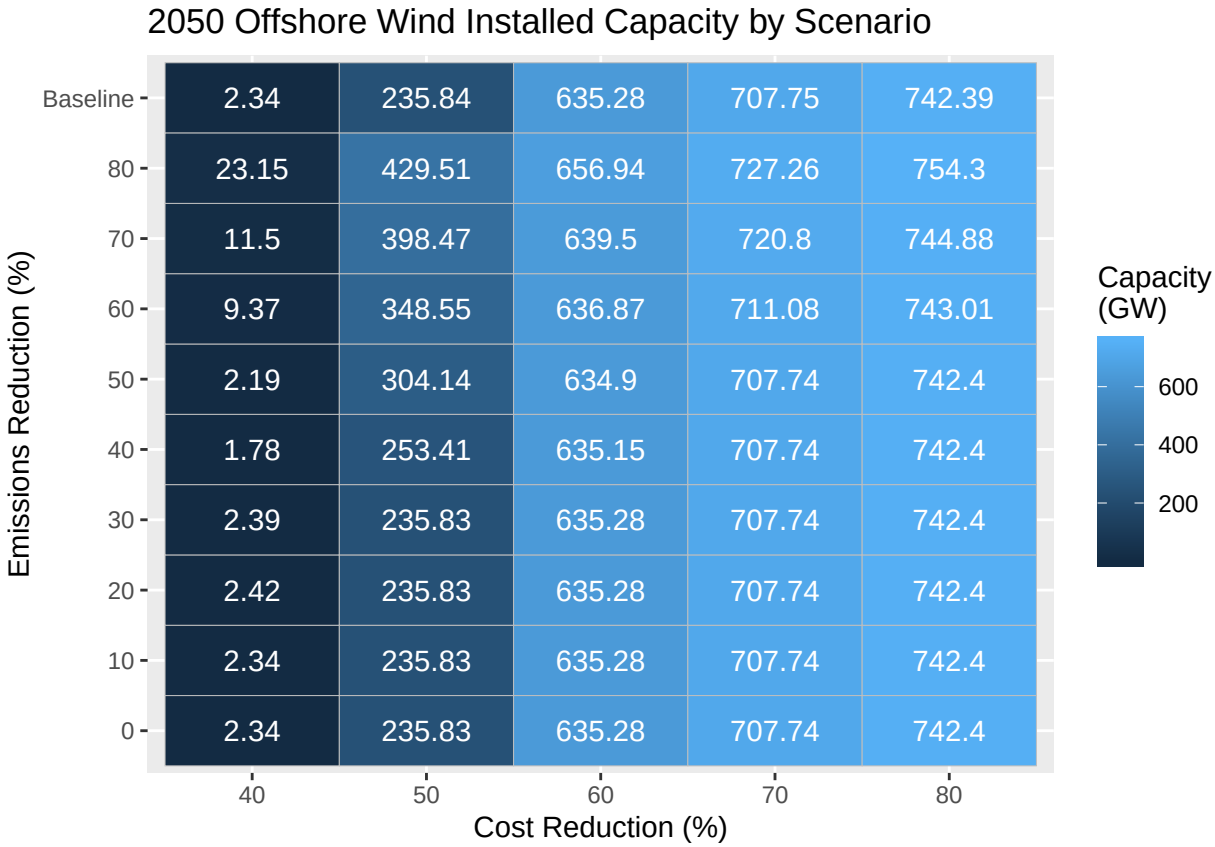



```
## Saving 6.5 x 4.5 in image
```

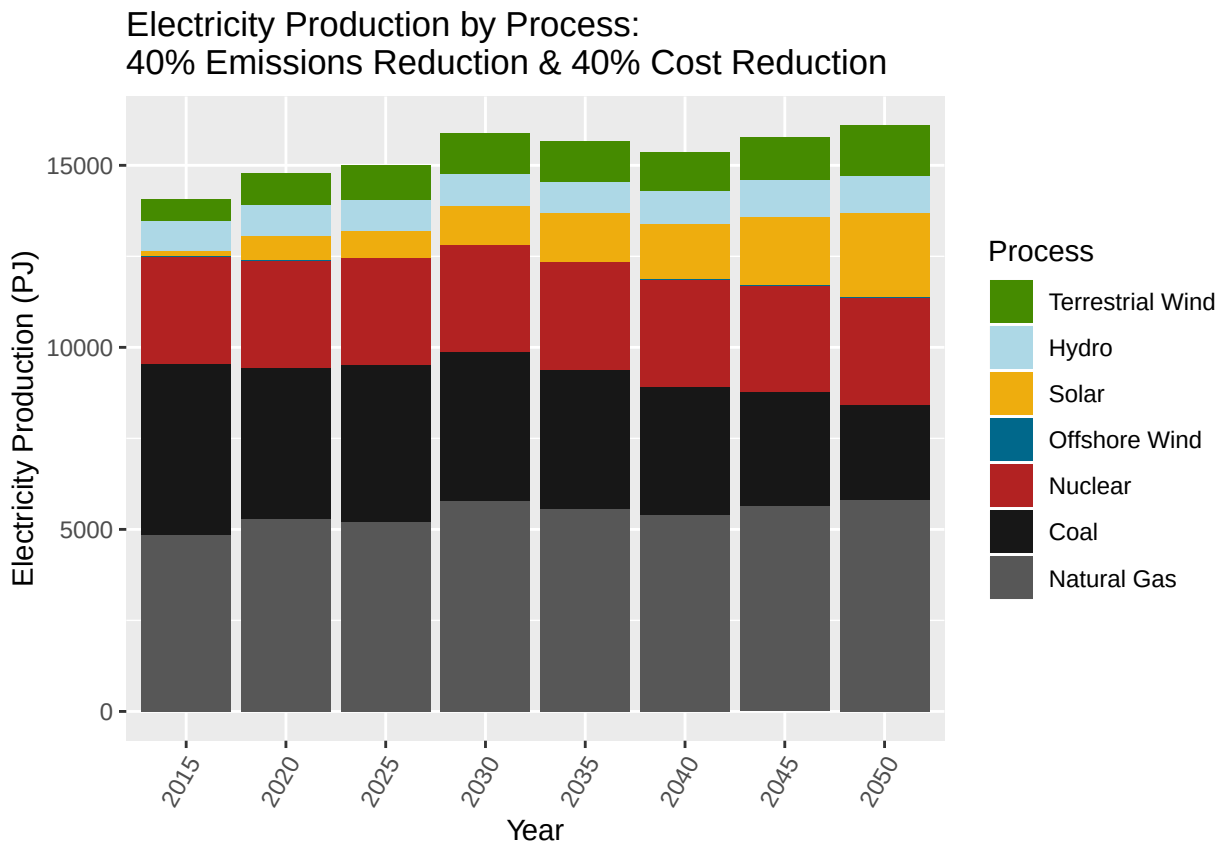


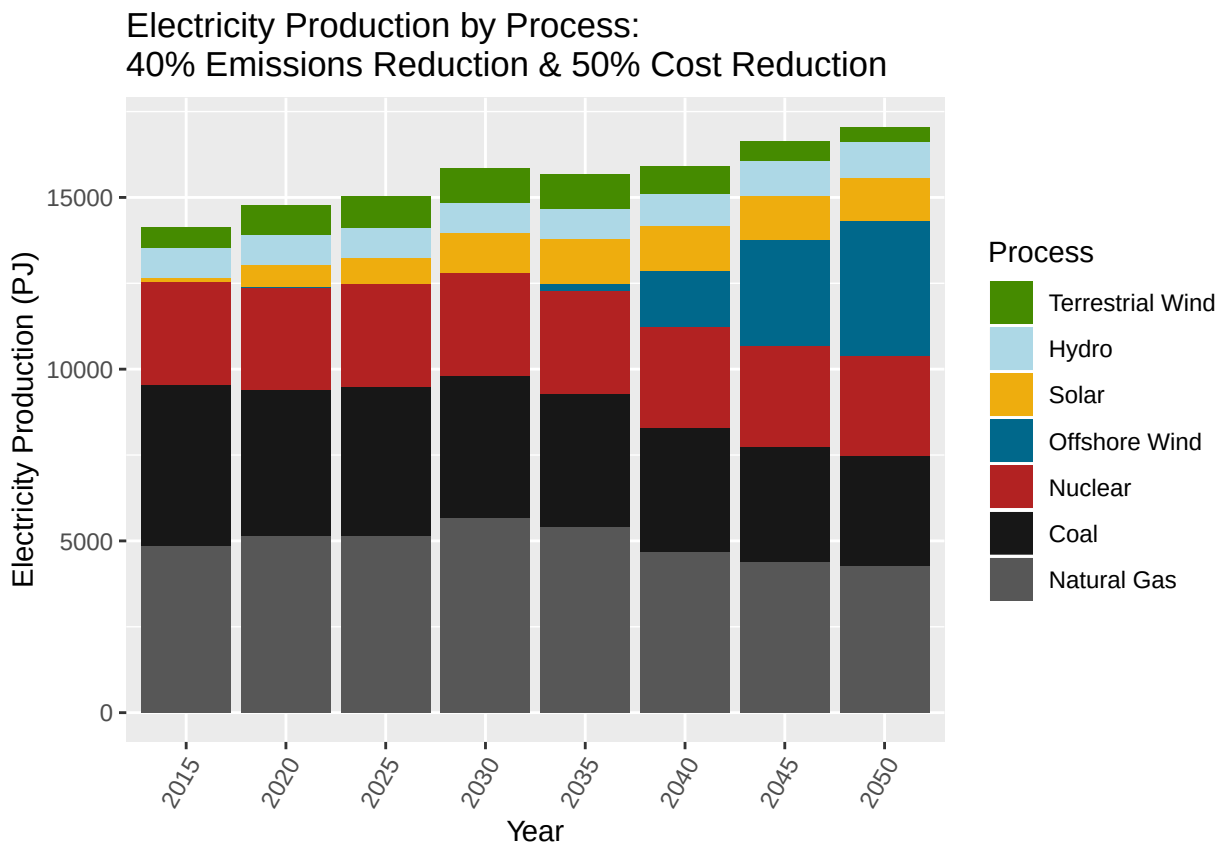
Region	2050 Total
R4	20.10
R6	286.80
R1	1516.05
R2	3274.12
R7	3798.65
R9	4102.15
R3	4313.82
R5	6593.44

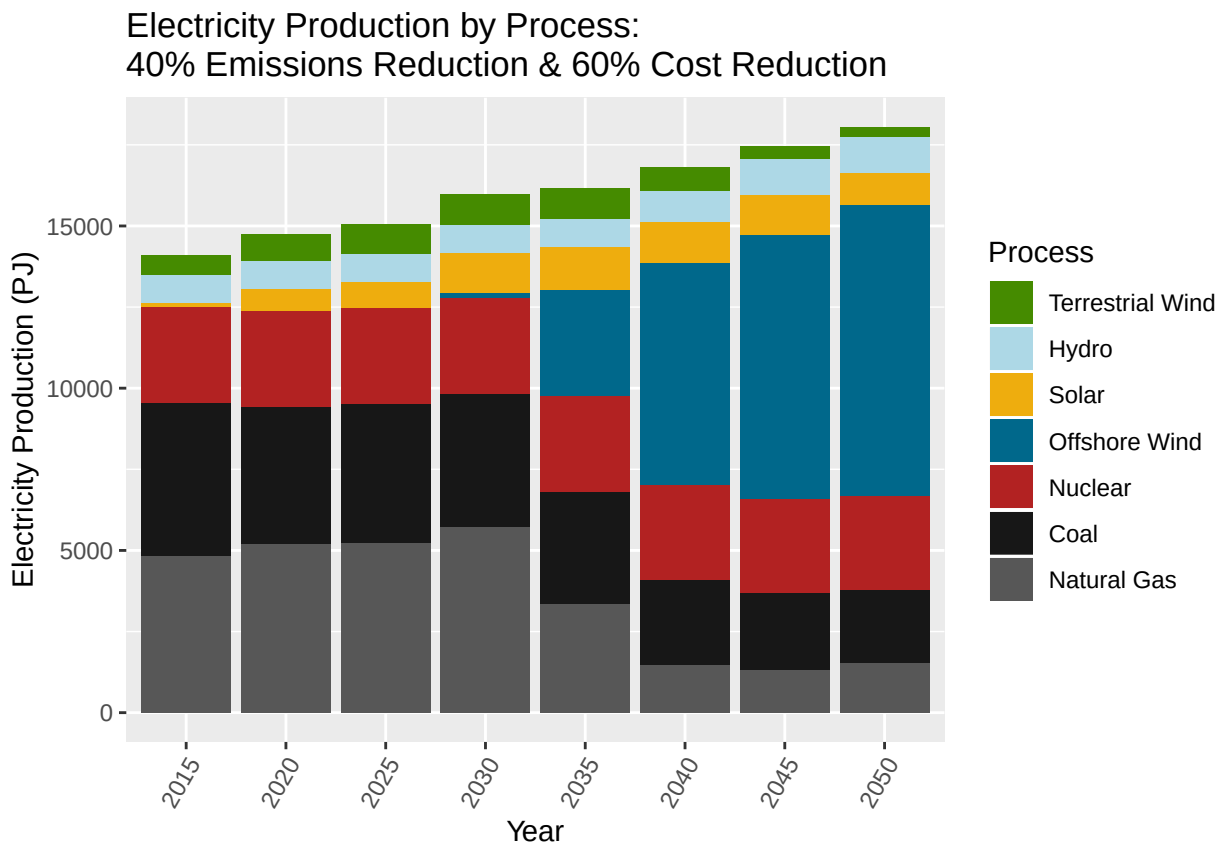
Region	2050 Total
R4	200.70
R6	2942.40
R1	25553.06
R2	48531.72
R7	48791.93
R9	57642.10
R3	66190.15
R5	87668.18

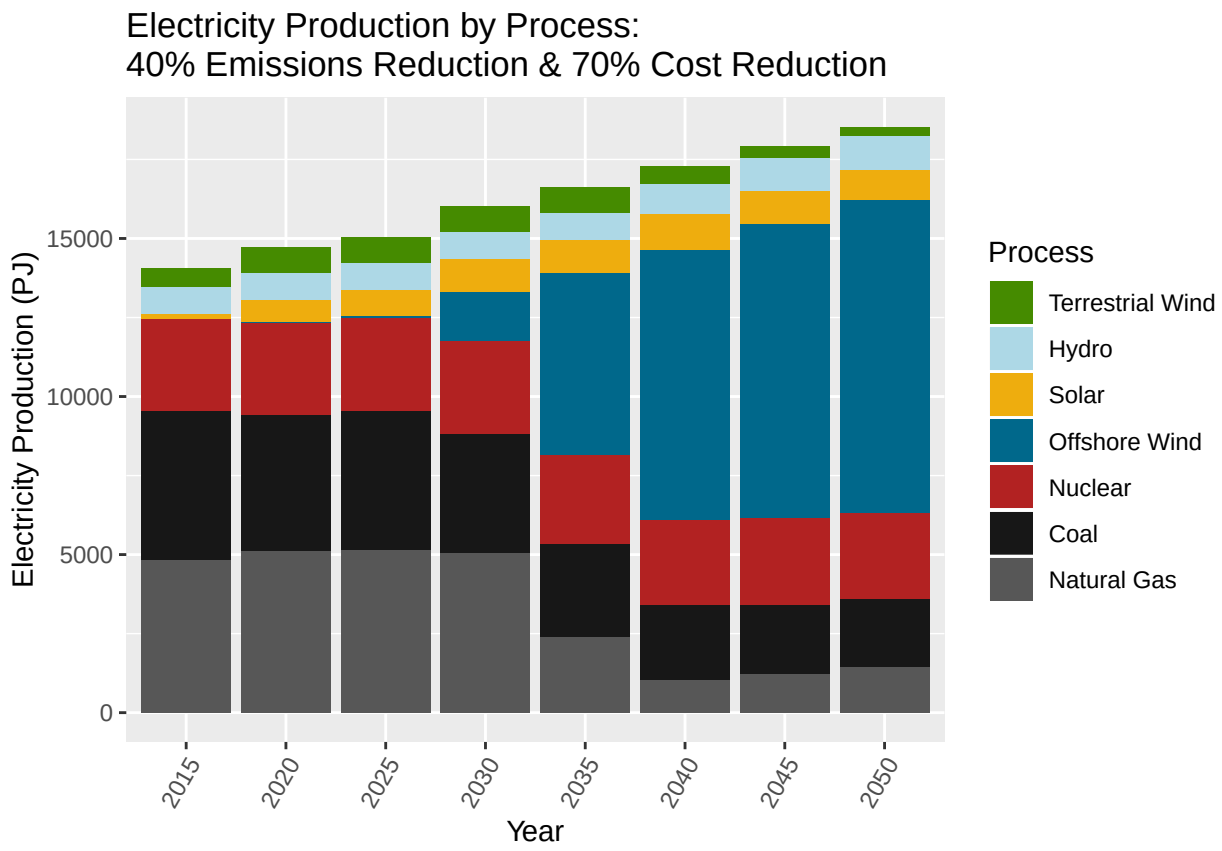
emred	40	50	60	70	80
0	2.34	235.83	635.28	707.74	742.40
10	2.34	235.83	635.28	707.74	742.40
20	2.42	235.83	635.28	707.74	742.40
30	2.39	235.83	635.28	707.74	742.40
40	1.78	253.41	635.15	707.74	742.40
50	2.19	304.14	634.90	707.74	742.40
60	9.37	348.55	636.87	711.08	743.01
70	11.50	398.47	639.50	720.80	744.88
80	23.15	429.51	656.94	727.26	754.30
Baseline	2.34	235.84	635.28	707.75	742.39

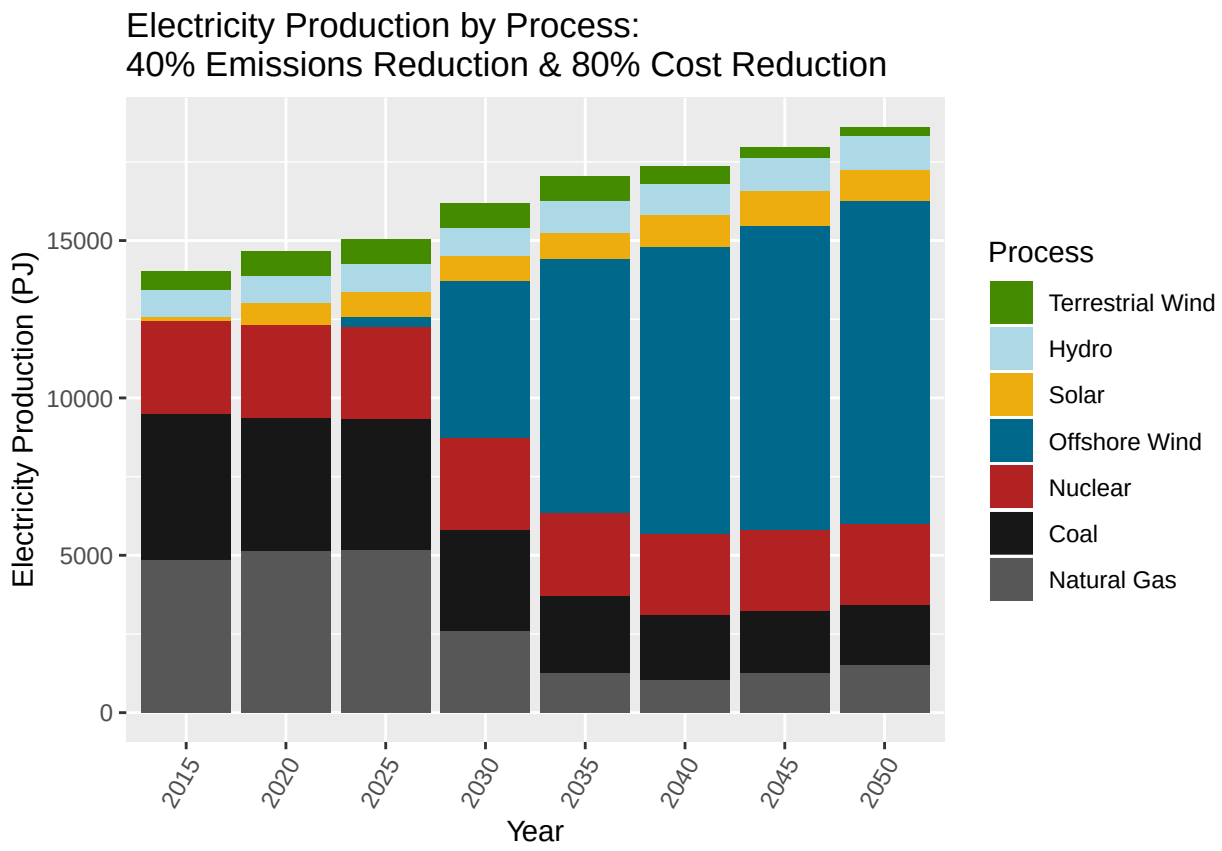
emred	40	50	60	70	80
0	40.21	3670.90	8970.71	9877.25	10256.55
10	40.21	3670.90	8970.71	9881.98	10256.55
20	41.63	3670.90	8970.71	9882.17	10256.55
30	41.10	3670.90	8970.71	9877.25	10256.54
40	30.58	3925.53	8967.39	9877.25	10256.55
50	37.71	4659.37	8959.04	9877.25	10256.54
60	156.85	5301.24	8984.13	9898.47	10261.34
70	193.37	5999.58	9017.96	9983.34	10281.62
80	381.42	6423.17	9247.84	10064.53	10382.78
Baseline	40.21	3670.91	8970.73	9882.58	10256.53

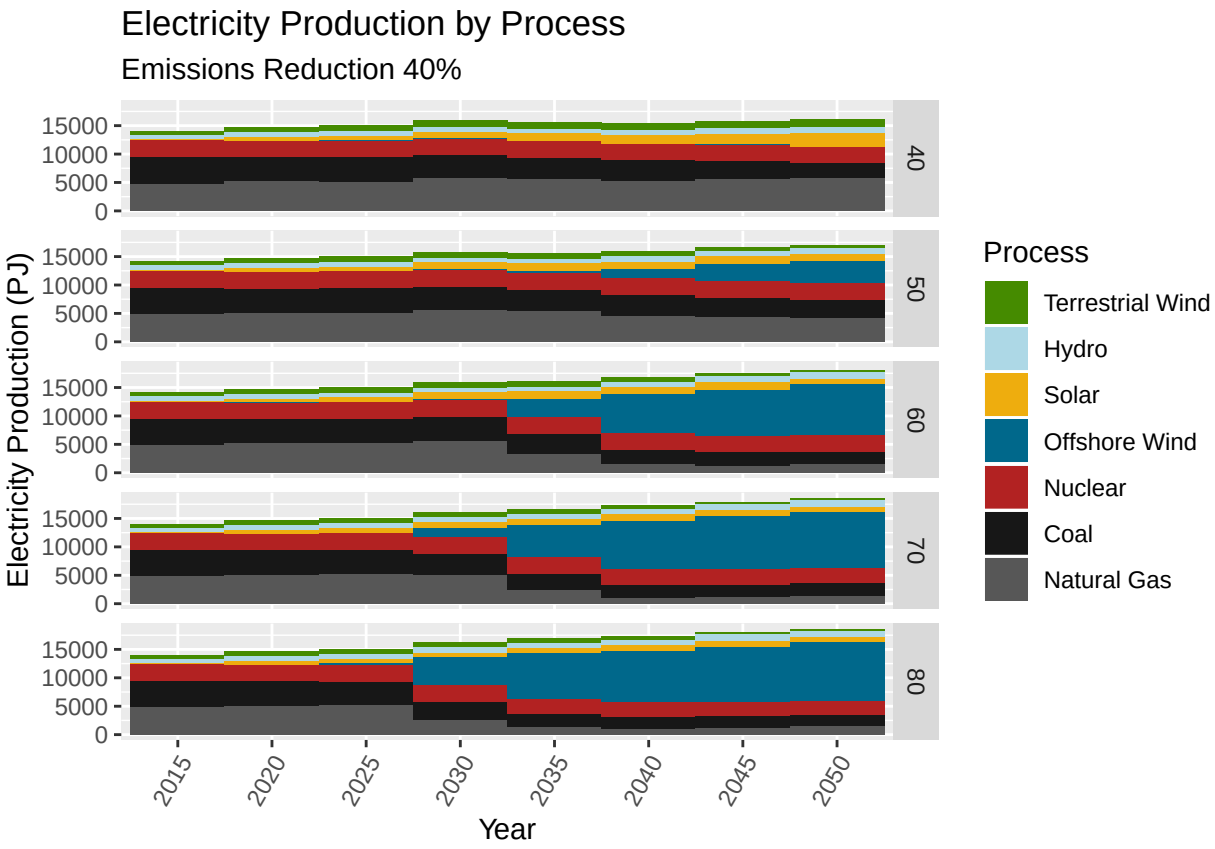


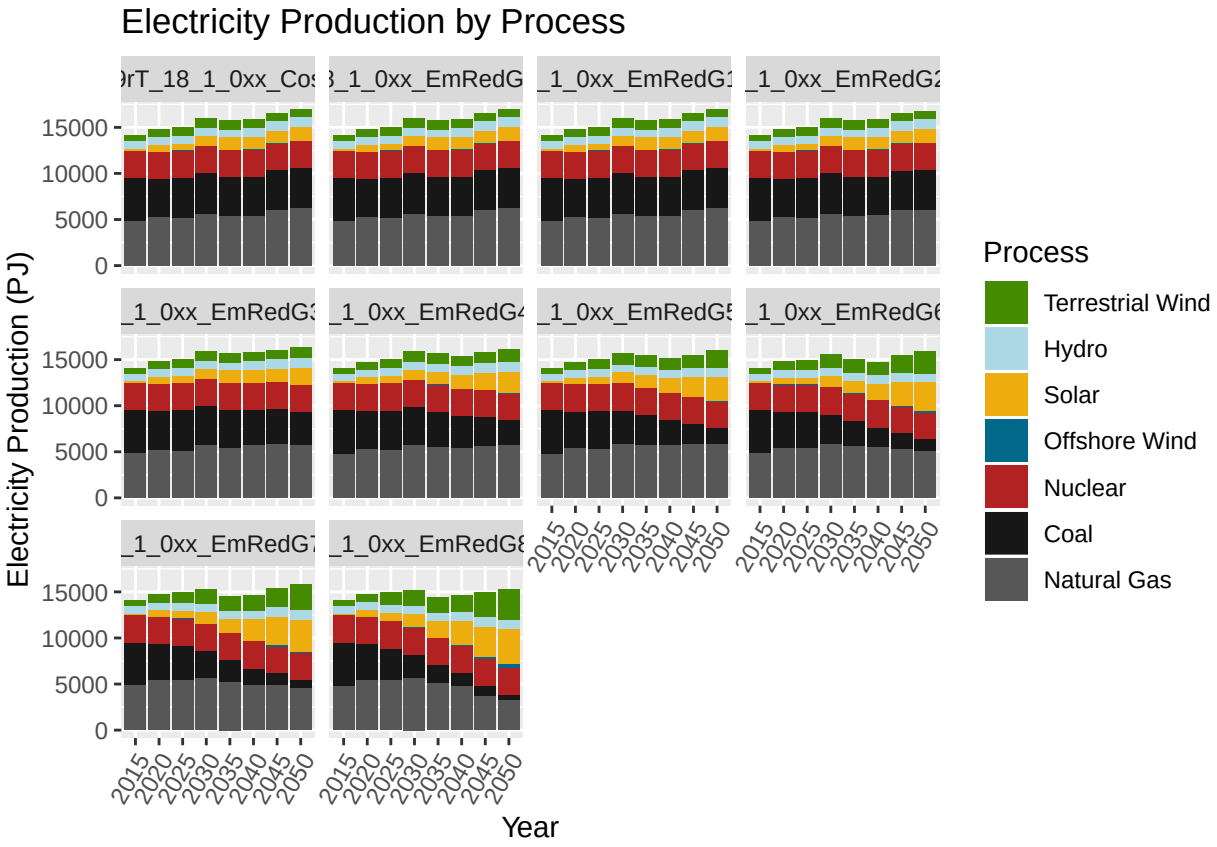

Electricity Production by Process:
40% Emissions Reduction & 50% Cost Reduction
Electricity Production (PJ)
15000
10000
5000
0
2015
2020
2025
2030
2035
2040
2045
2050
Year
Process
Terrestrial Wind
Hydro
Solar
Offshore Wind
Nuclear
Coal
Natural Gas

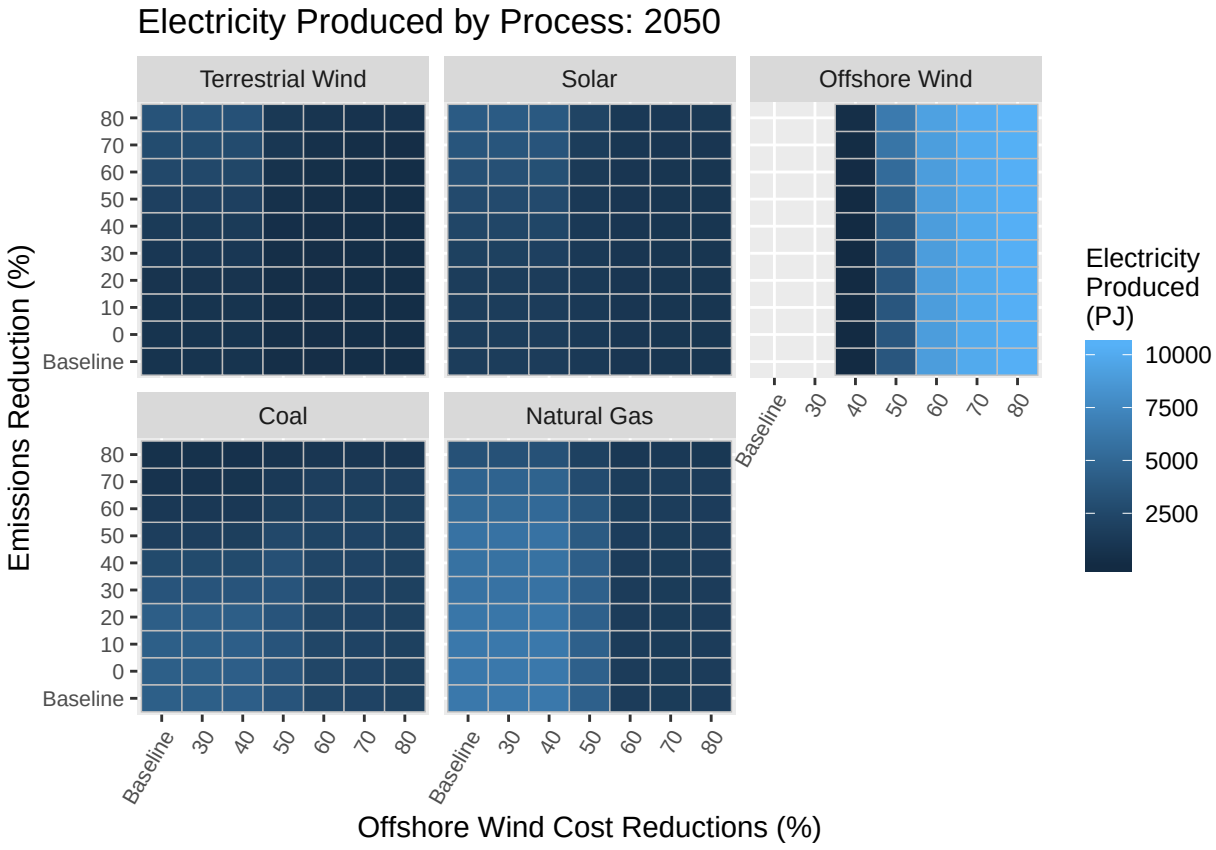

Electricity Production by Process:
40% Emissions Reduction & 60% Cost Reduction
Electricity Production (PJ)
15000
10000
5000
0
2015
2020
2025
2030
2035
2040
2045
2050
Year
Process
Terrestrial Wind
Hydro
Solar
Offshore Wind
Nuclear
Coal
Natural Gas

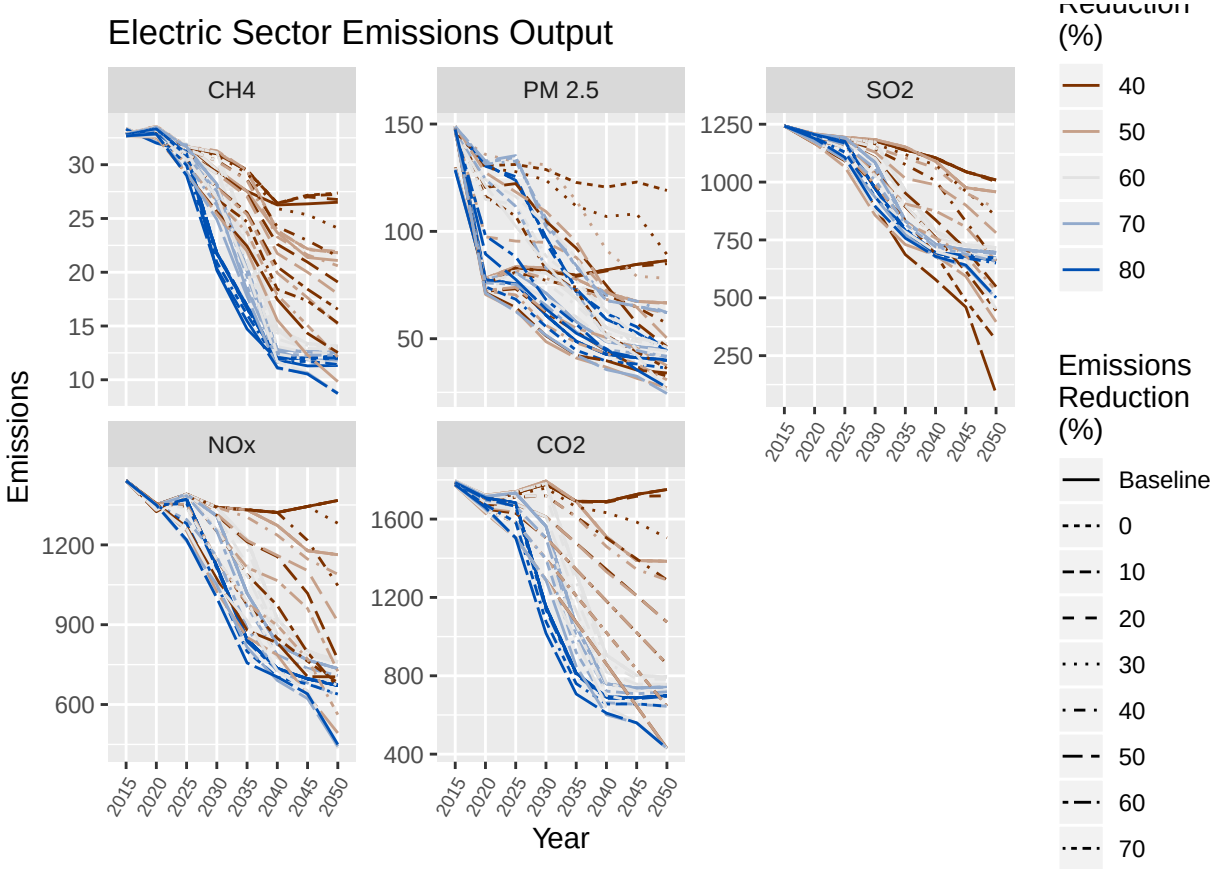

Electricity Production by Process:
40% Emissions Reduction & 70% Cost Reduction
Electricity Production (PJ)
15000
10000
5000
0
2015
2020
2025
2030
2035
2040
2045
2050
Year
Process
Terrestrial Wind
Hydro
Solar
Offshore Wind
Nuclear
Coal
Natural Gas


Electricity Production by Process:
40% Emissions Reduction & 80% Cost Reduction
Electricity Production (PJ)
15000
10000
5000
0
2015
2020
2025
2030
2035
2040
2045
2050
Year
Process
Terrestrial Wind
Hydro
Solar
Offshore Wind
Nuclear
Coal
Natural Gas

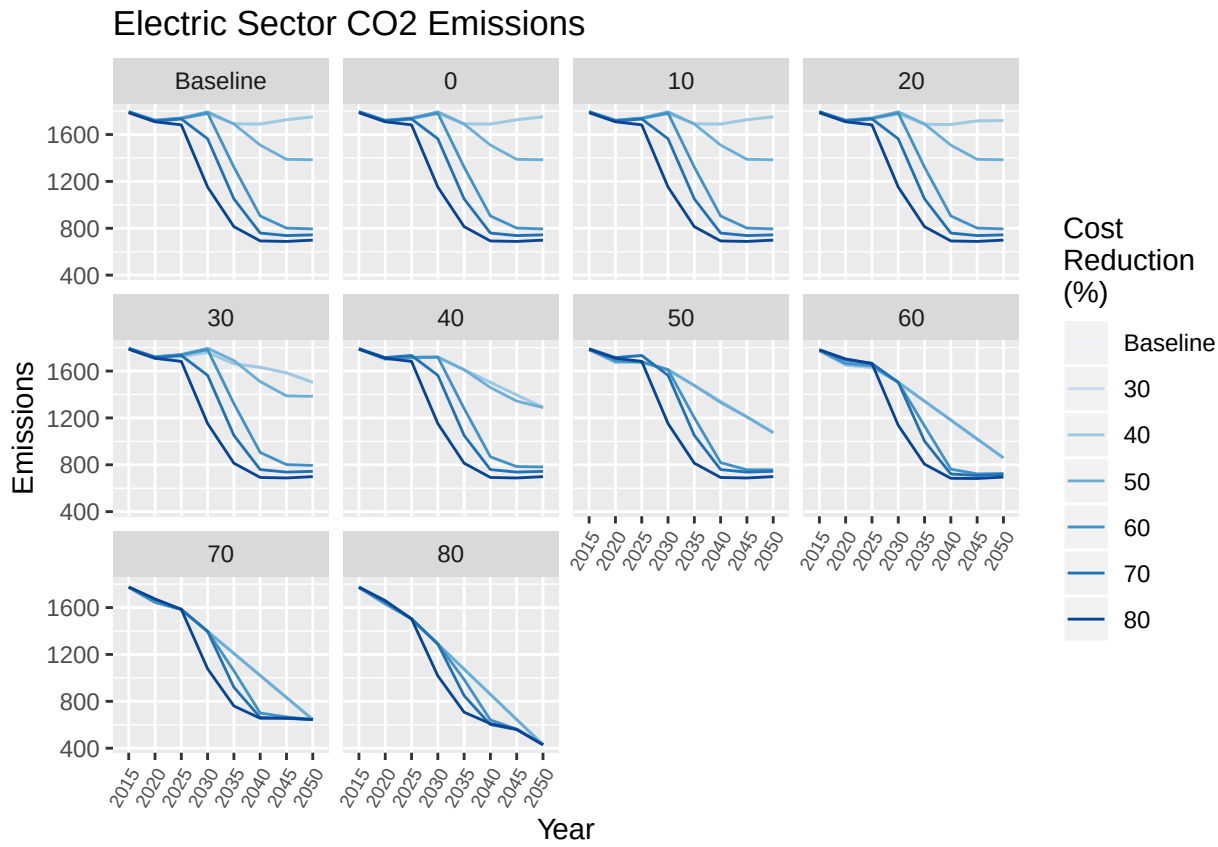

Electricity Production by Process
Emissions Reduction 40%
Electricity Production (PJ)
15000
10000
5000
0
40
50
60
70
80
2015
2020
2025
2030
2035
2040
2045
2050
Year
Process
Terrestrial Wind
Hydro
Solar
Offshore Wind
Nuclear
Coal
Natural Gas


Electricity Production by Process
Electricity Production (PJ)
15000
10000
5000
0
2015
2020
2025
2030
2035
2040
2045
2050
Year
Process
Terrestrial Wind
Hydro
Solar
Offshore Wind
Nuclear
Coal
Natural Gas

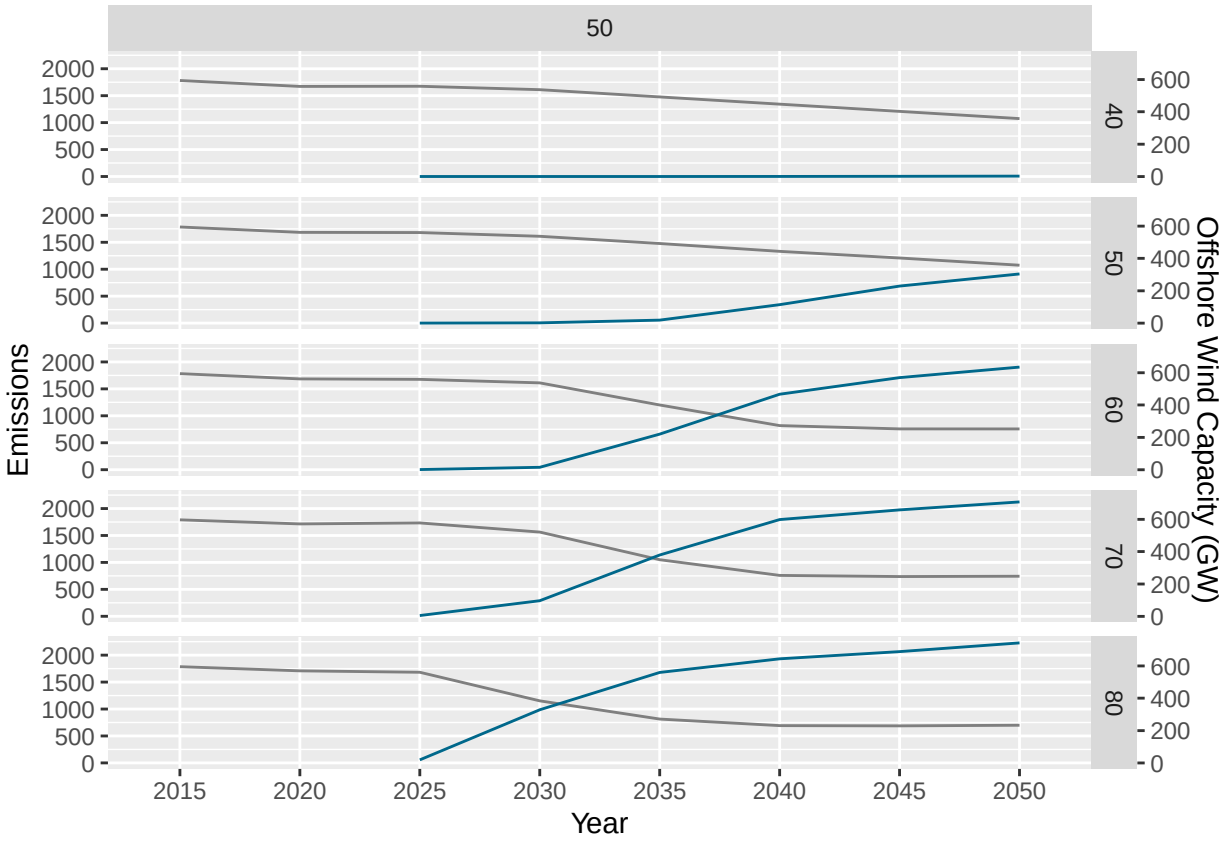

Electricity Produced by Process: 2050
Terrestrial Wind
Solar
Offshore Wind
Coal
Natural Gas
Emissions Reduction (%)
80
70
60
50
40
30
20
10
0
Baseline
Offshore Wind Cost Reductions (%)
Electricity Produced (PJ)
10000
7500
5000
2500



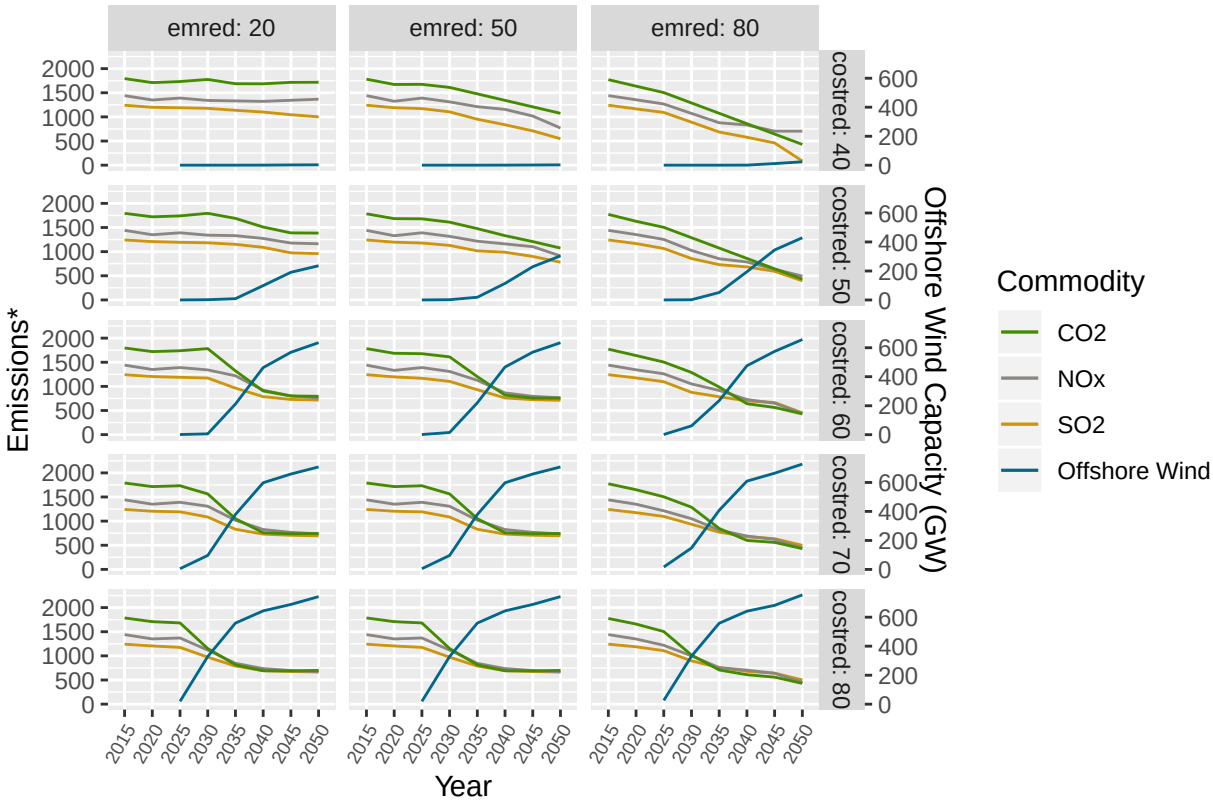

```
## Saving 6.5 x 4.5 in image
```



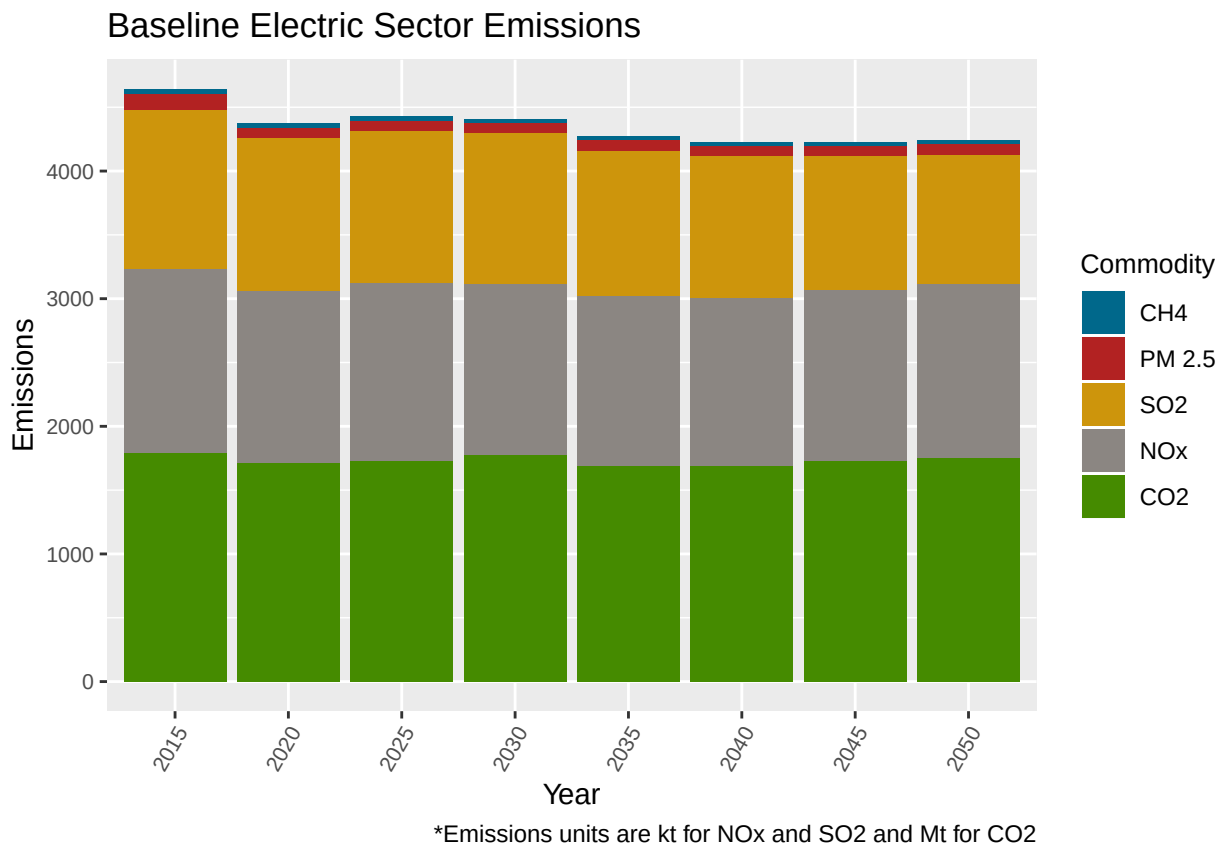

```
## Saving 6.5 x 4.5 in image
```



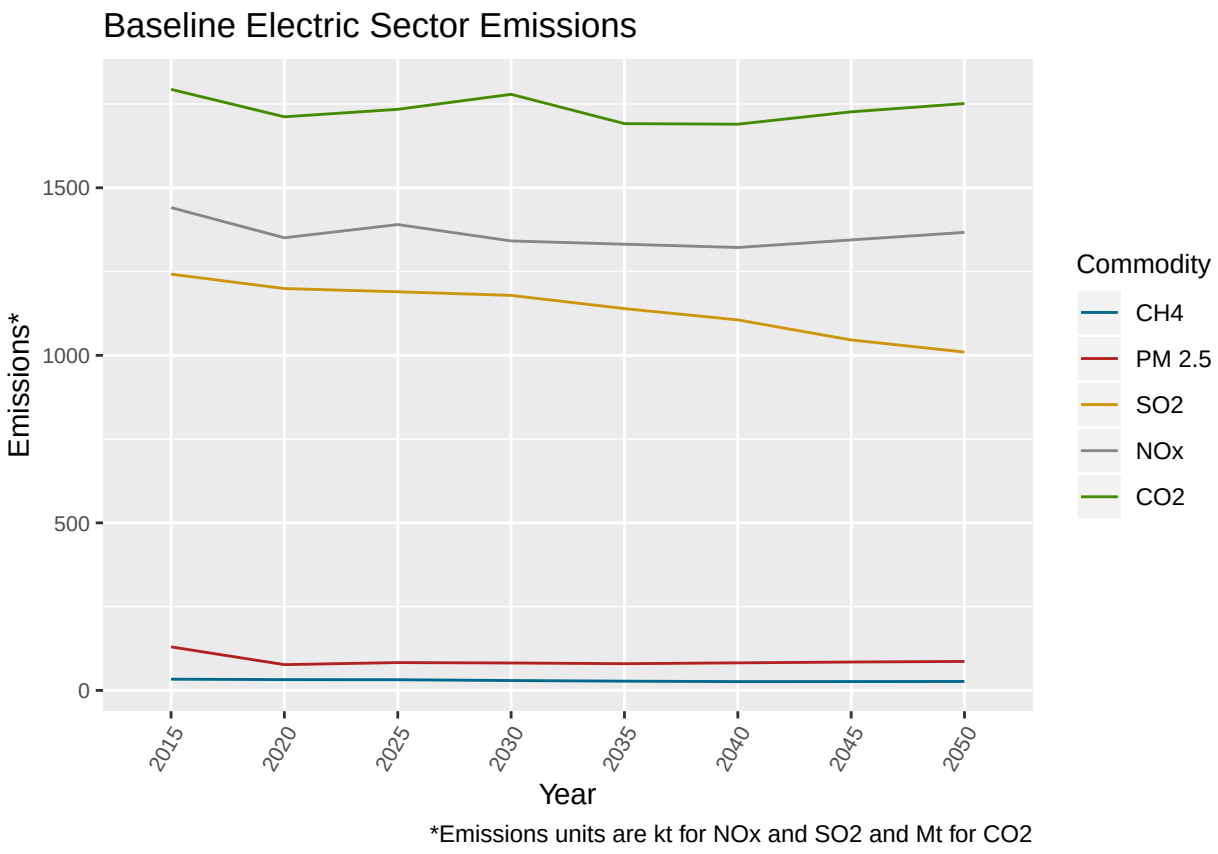

```
## Saving 6.5 x 4.5 in image
```

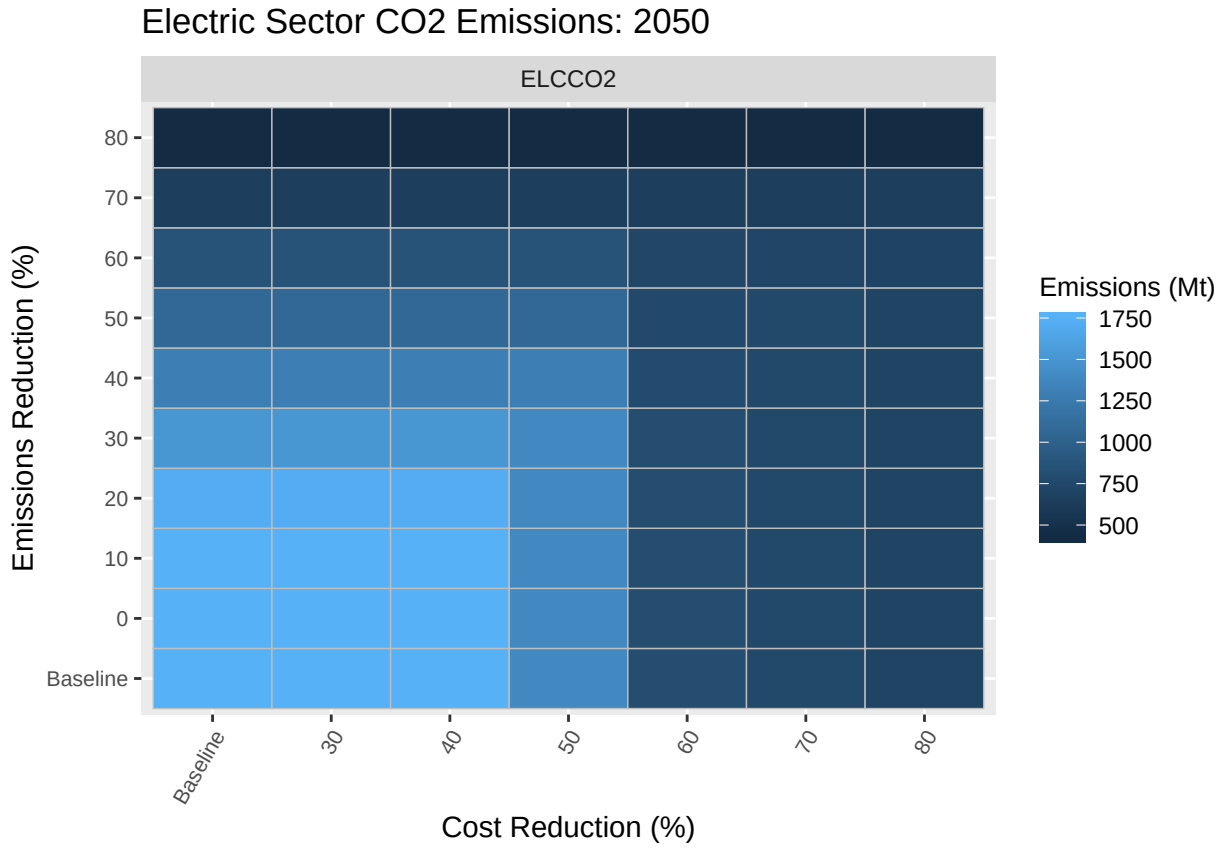


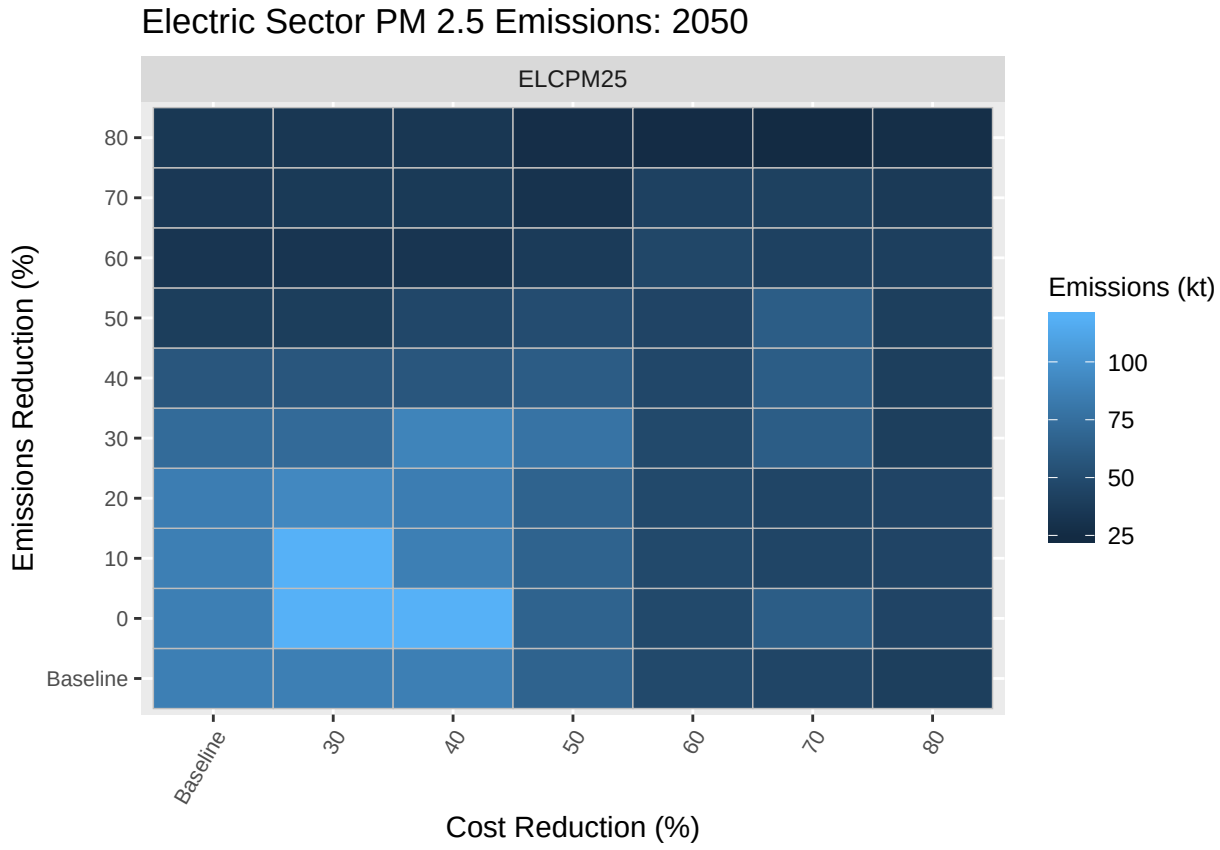

```
## Saving 6.5 x 4.5 in image
```

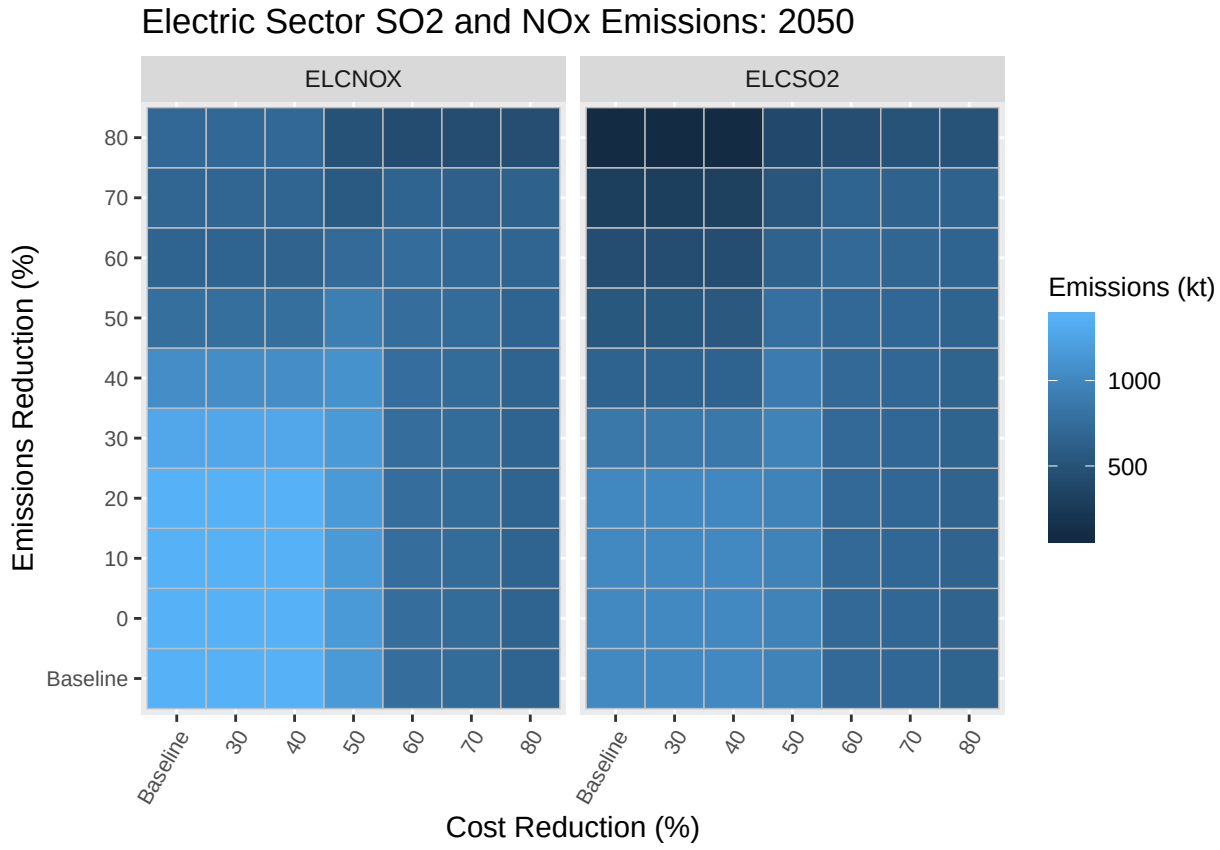


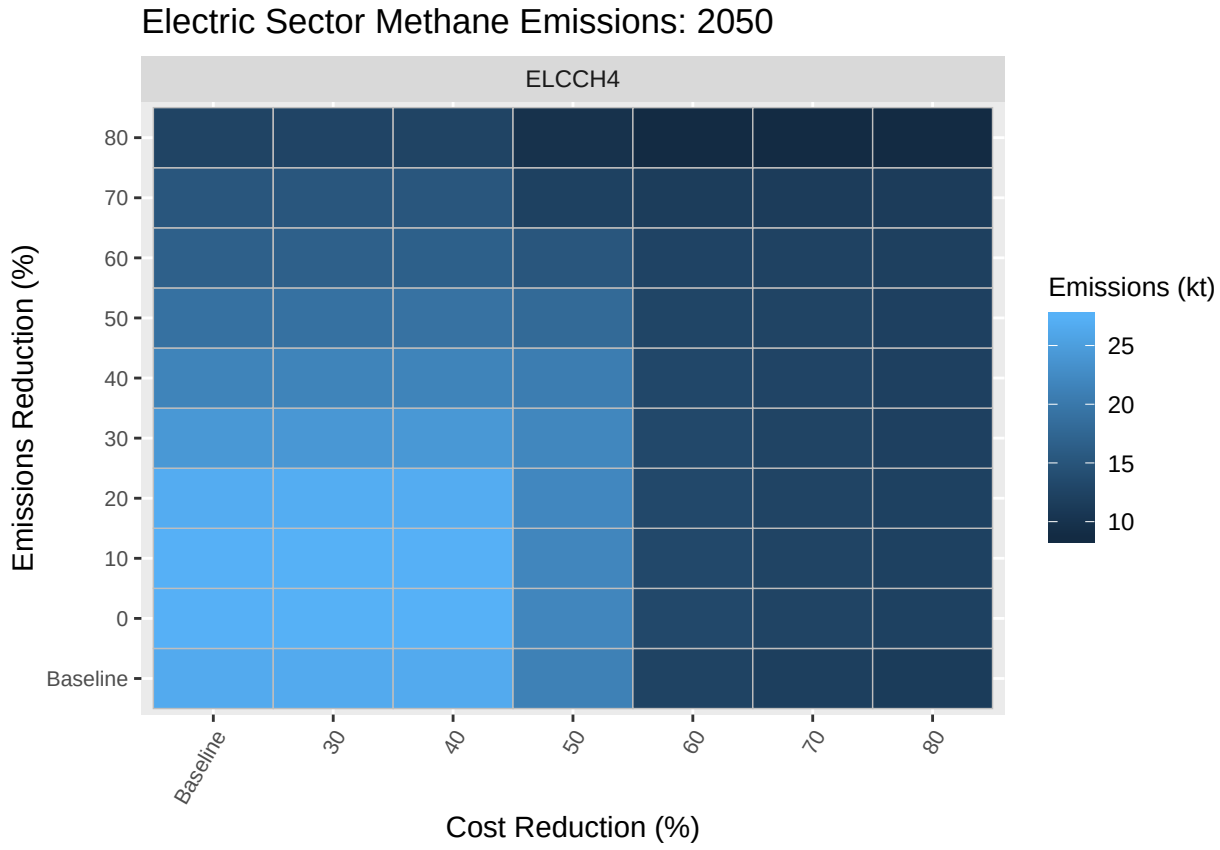

```
## Saving 6.5 x 4.5 in image
```

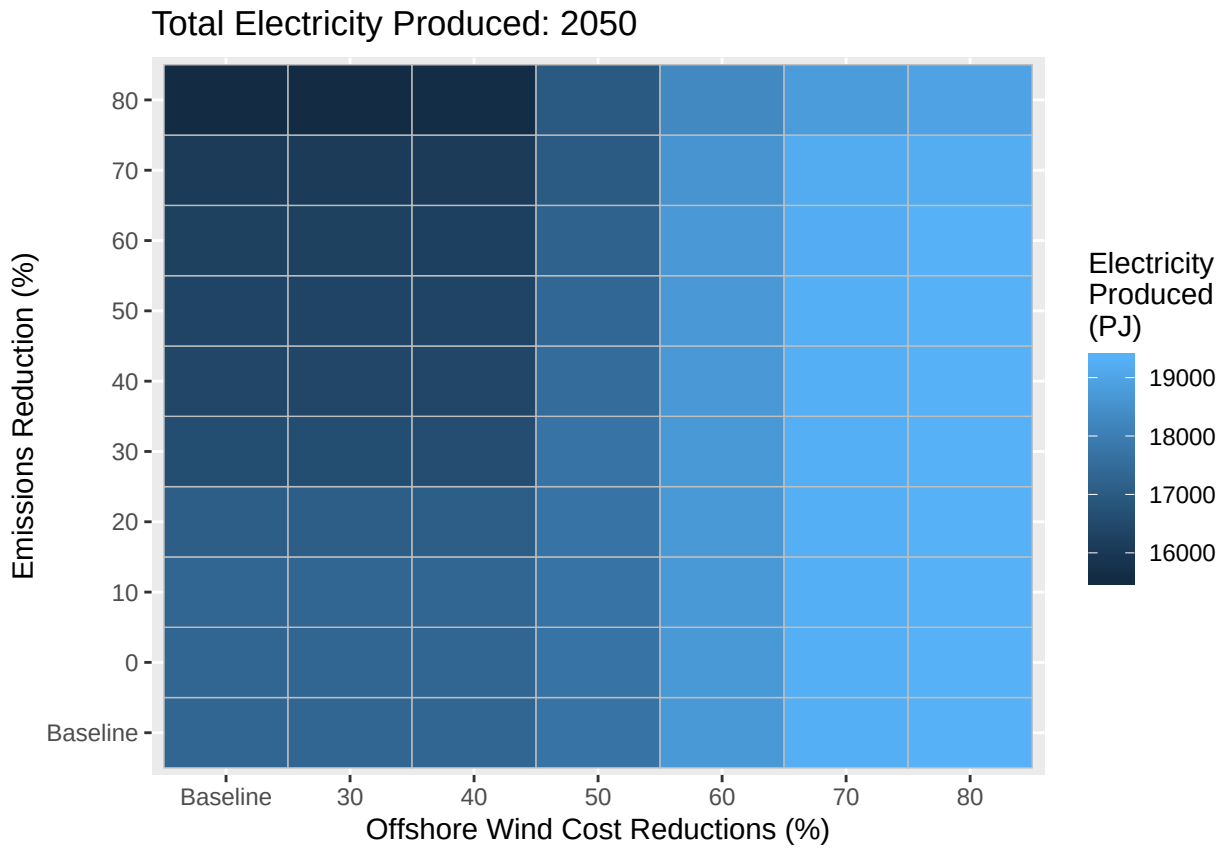

Baseline Electric Sector Emissions
Emissions*
1500
1000
500
0
2015
2020
2025
2030
2035
2040
2045
2050
Year
Commodity
CH4
PM 2.5
SO2
NOx
CO2
*Emissions units are kt for NOx and SO2 and Mt for CO2


Electric Sector CO2 Emissions: 2050
ELCCO2
Emissions Reduction (%)
80
70
60
50
40
30
20
10
0
Baseline
Baseline
30
40
50
60
70
80
Cost Reduction (%)
Emissions (Mt)
1750
1500
1250
1000
750
500

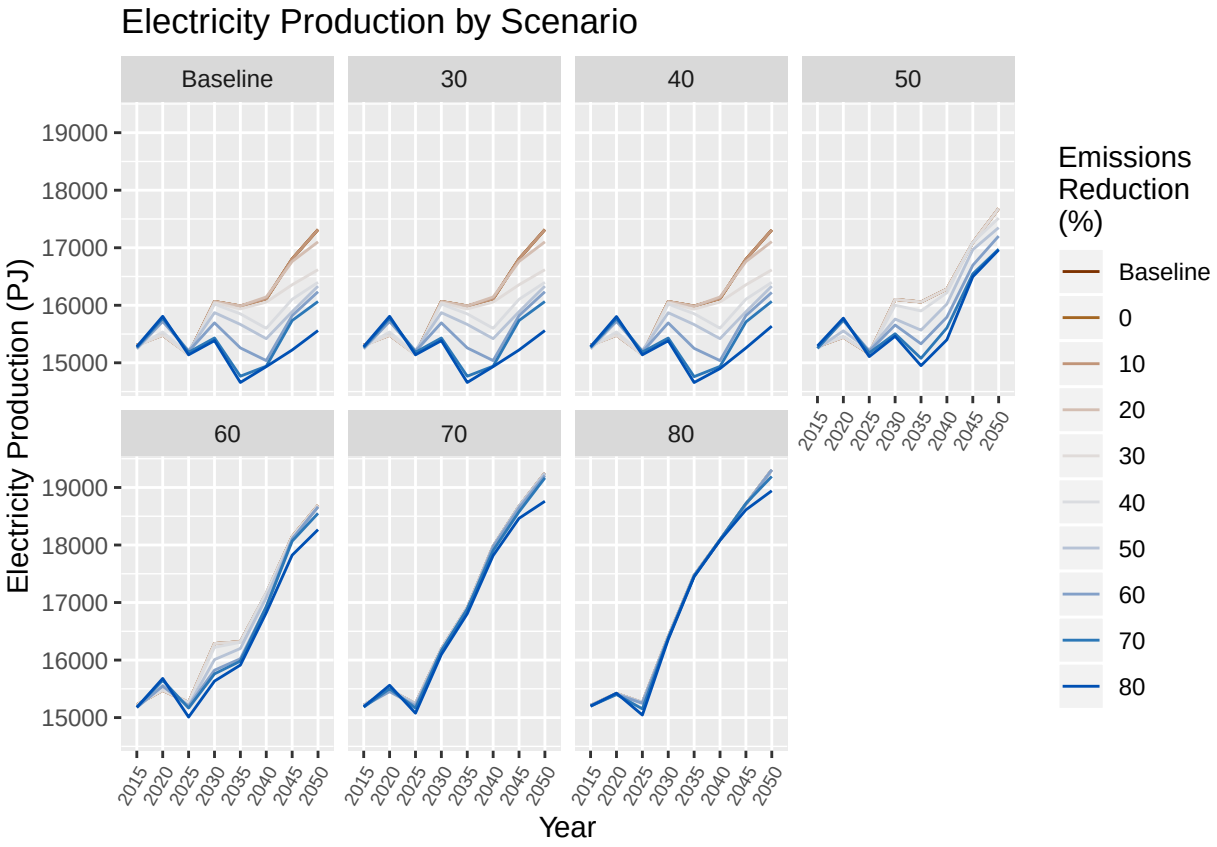

Electric Sector PM 2.5 Emissions: 2050
ELCPM25
Emissions Reduction (%)
80
70
60
50
40
30
20
10
0
Baseline
Baseline
30
40
50
60
70
80
Cost Reduction (%)
Emissions (kt)
100
75
50
25

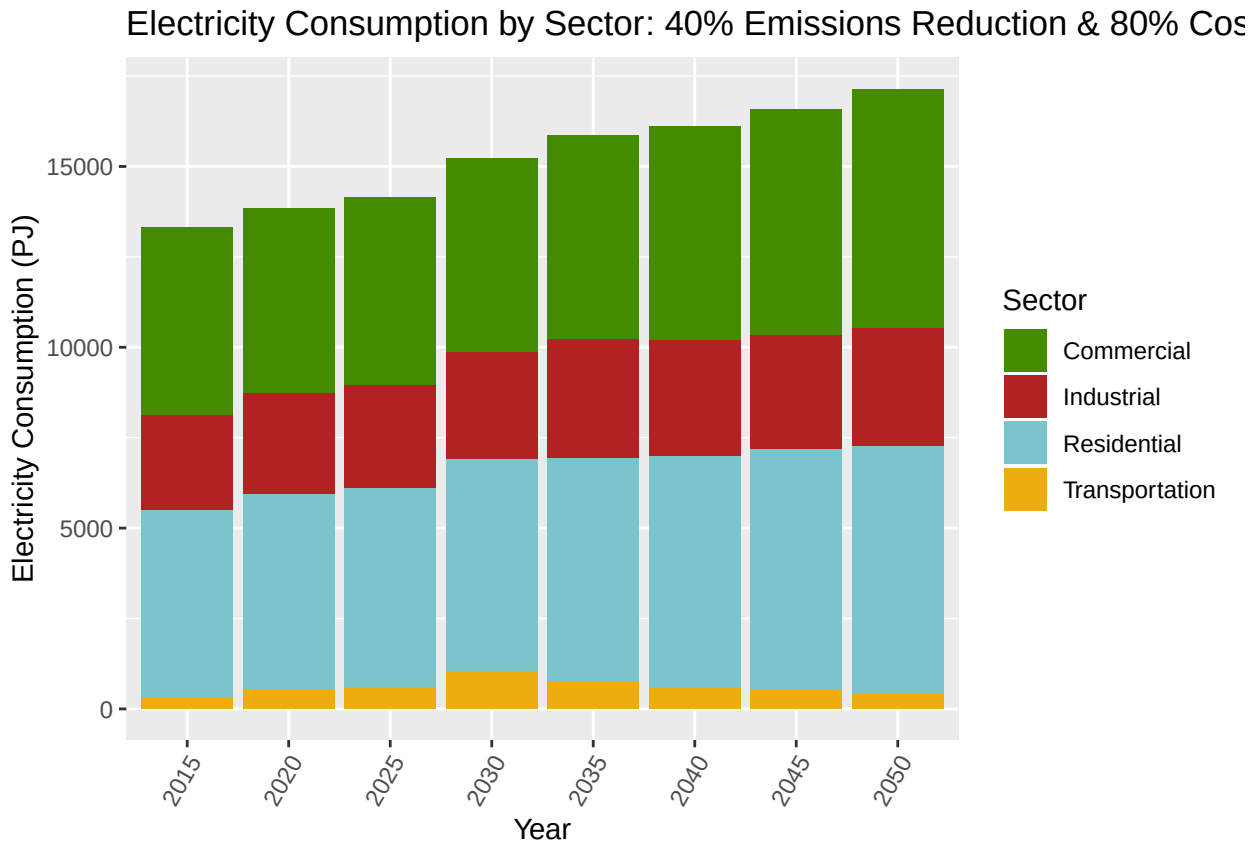

Electric Sector SO2 and NOx Emissions: 2050
ELCNOX
ELCSO2
Emissions Reduction (%)
80
70
60
50
40
30
20
10
0
Baseline
Baseline
30
40
50
60
70
80
Cost Reduction (%)
Emissions (kt)
1000
500

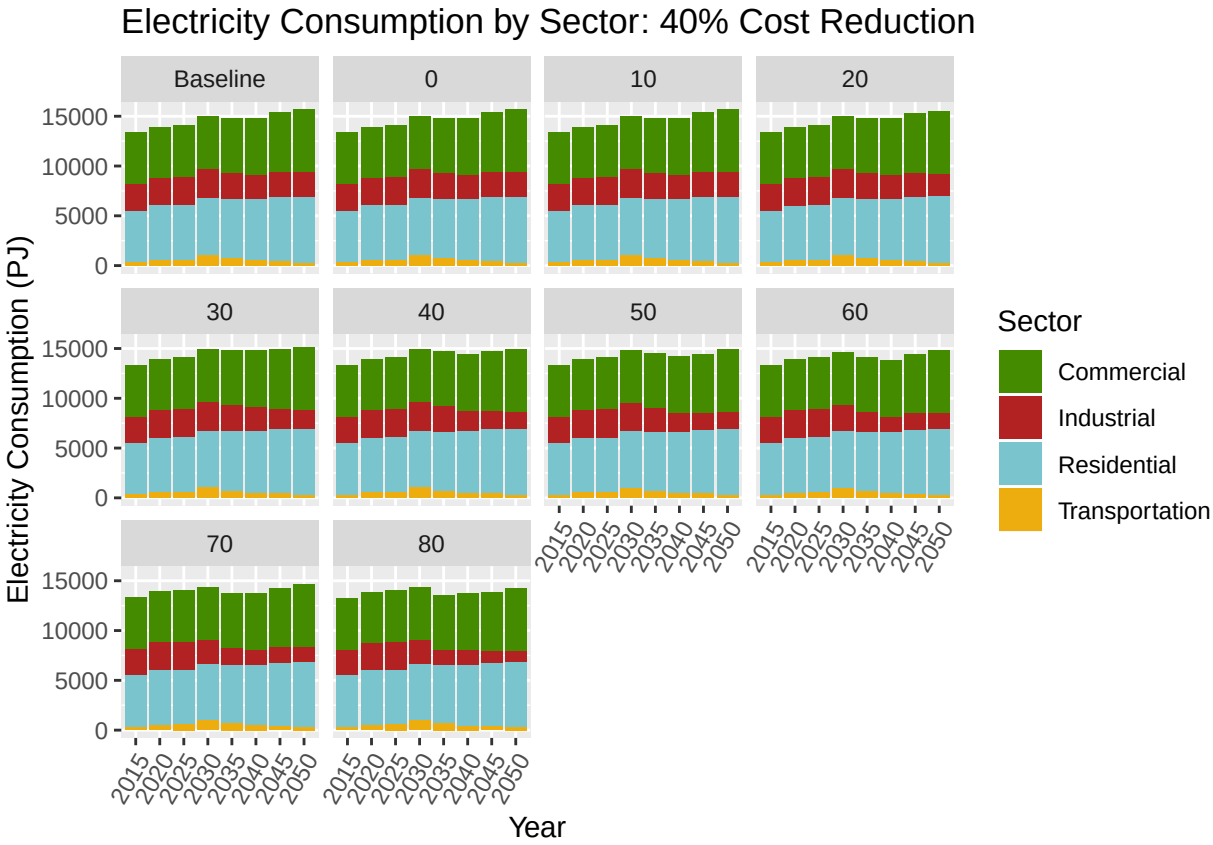

Electric Sector Methane Emissions: 2050
ELCCH4
Emissions Reduction (%)
80
70
60
50
40
30
20
10
0
Baseline
Baseline
30
40
50
60
70
80
Cost Reduction (%)
Emissions (kt)
25
20
15
10

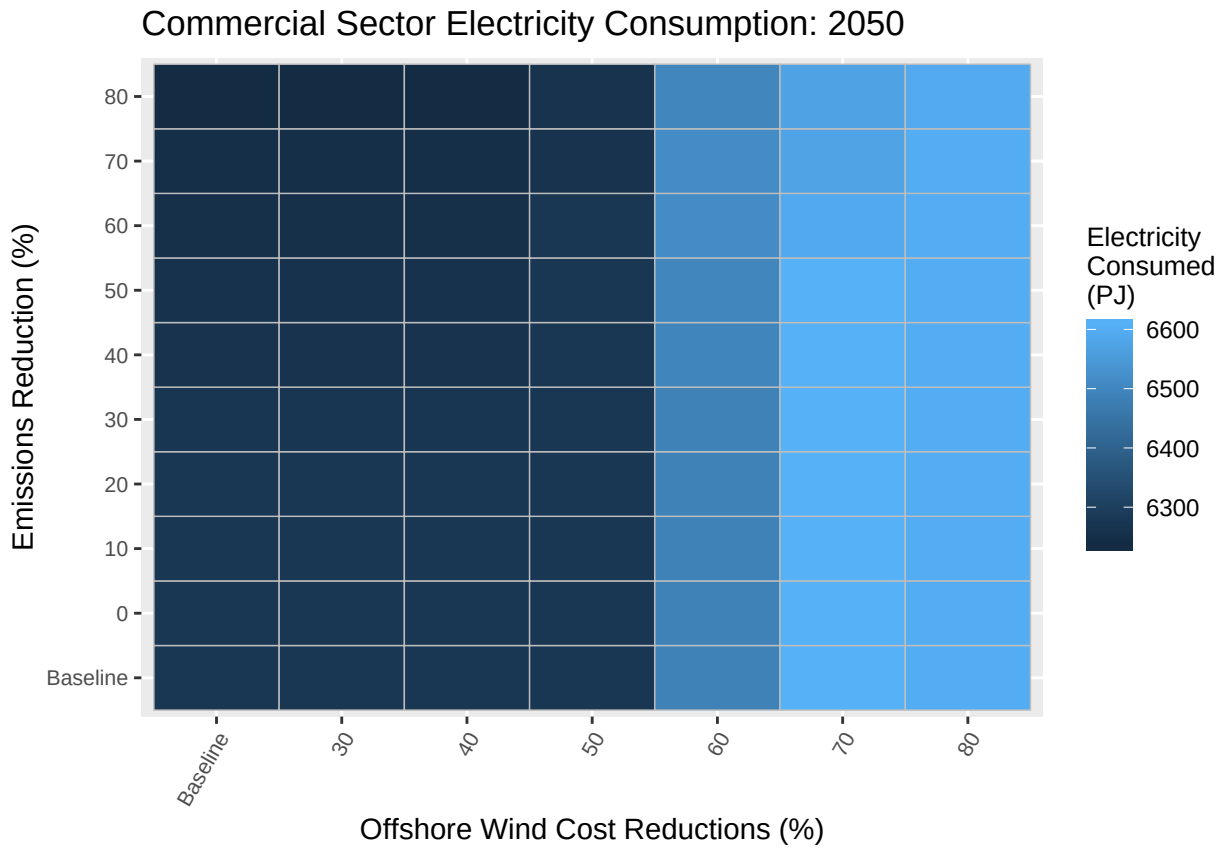


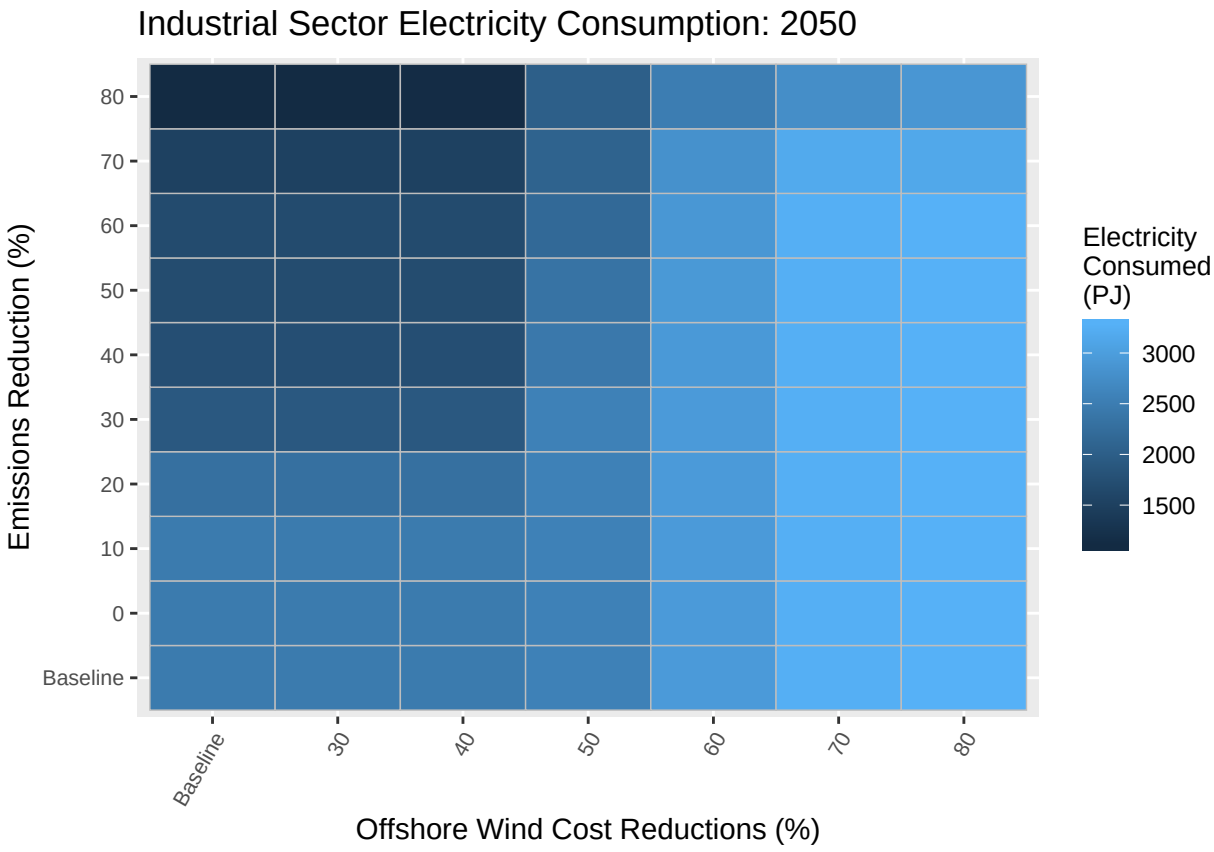

```
## Saving 6.5 x 4.5 in image
```

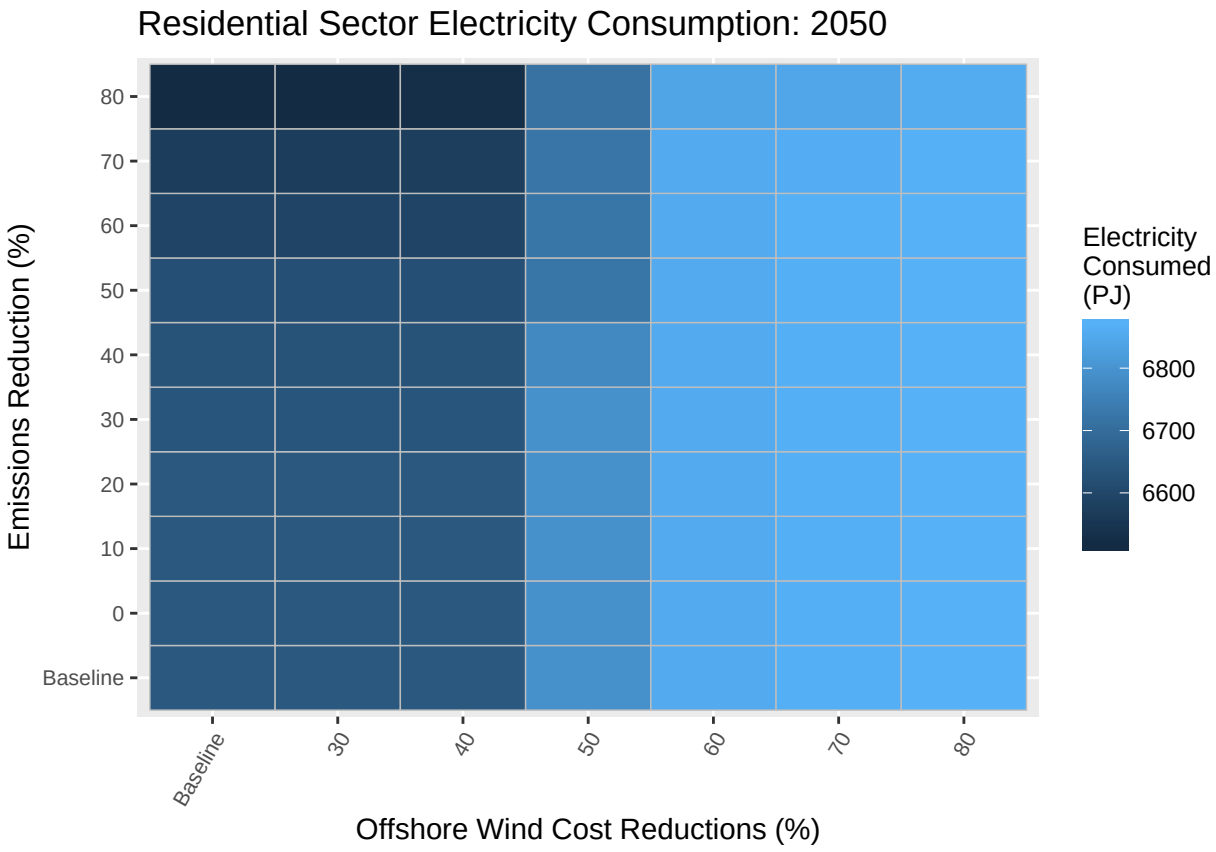

Electricity Production by Scenario
Baseline
30
40
50
60
70
80
Electricity Production (PJ)
19000
18000
17000
16000
15000
2015
2020
2025
2030
2035
2040
2045
2050
Year
Emissions Reduction (%)
Baseline
0
10
20
30
40
50
60
70
80

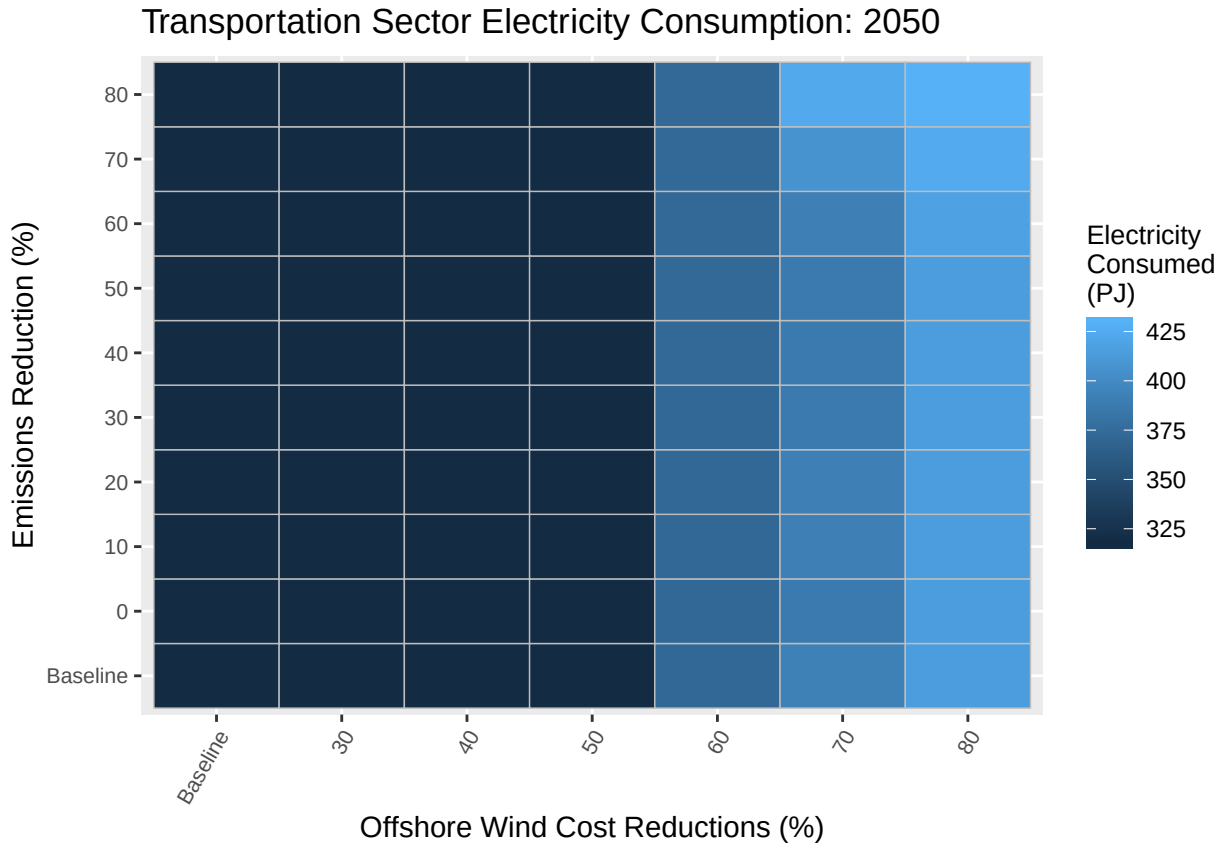

Electricity Consumption by Sector: 40% Emissions Reduction & 80% Cos
Electricity Consumption (PJ)
15000
10000
5000
0
2015
2020
2025
2030
2035
2040
2045
2050
Year
Sector
Commercial
Industrial
Residential
Transportation


Electricity Consumption by Sector: 40% Cost Reduction
Baseline
0
10
20
30
40
50
60
70
80
Electricity Consumption (PJ)
15000
10000
5000
0
2015
2020
2025
2030
2035
2040
2045
2050
Year
Sector
Commercial
Industrial
Residential
Transportation


Commercial Sector Electricity Consumption: 2050
Emissions Reduction (%)
80
70
60
50
40
30
20
10
0
Baseline
Baseline
30
40
50
60
70
80
Offshore Wind Cost Reductions (%)
Electricity Consumed (PJ)
6600
6500
6400
6300


Industrial Sector Electricity Consumption: 2050
Emissions Reduction (%)
80
70
60
50
40
30
20
10
0
Baseline
Baseline
30
40
50
60
70
80
Offshore Wind Cost Reductions (%)
Electricity Consumed (PJ)
3000
2500
2000
1500


Residential Sector Electricity Consumption: 2050
Emissions Reduction (%)
80
70
60
50
40
30
20
10
0
Baseline
Baseline
30
40
50
60
70
80
Offshore Wind Cost Reductions (%)
Electricity Consumed (PJ)
6800
6700
6600




```
## [1] "Offshore Wind Results Processing.R"
```