The Future of IGCC w/ Sequestration in the NEMS Model

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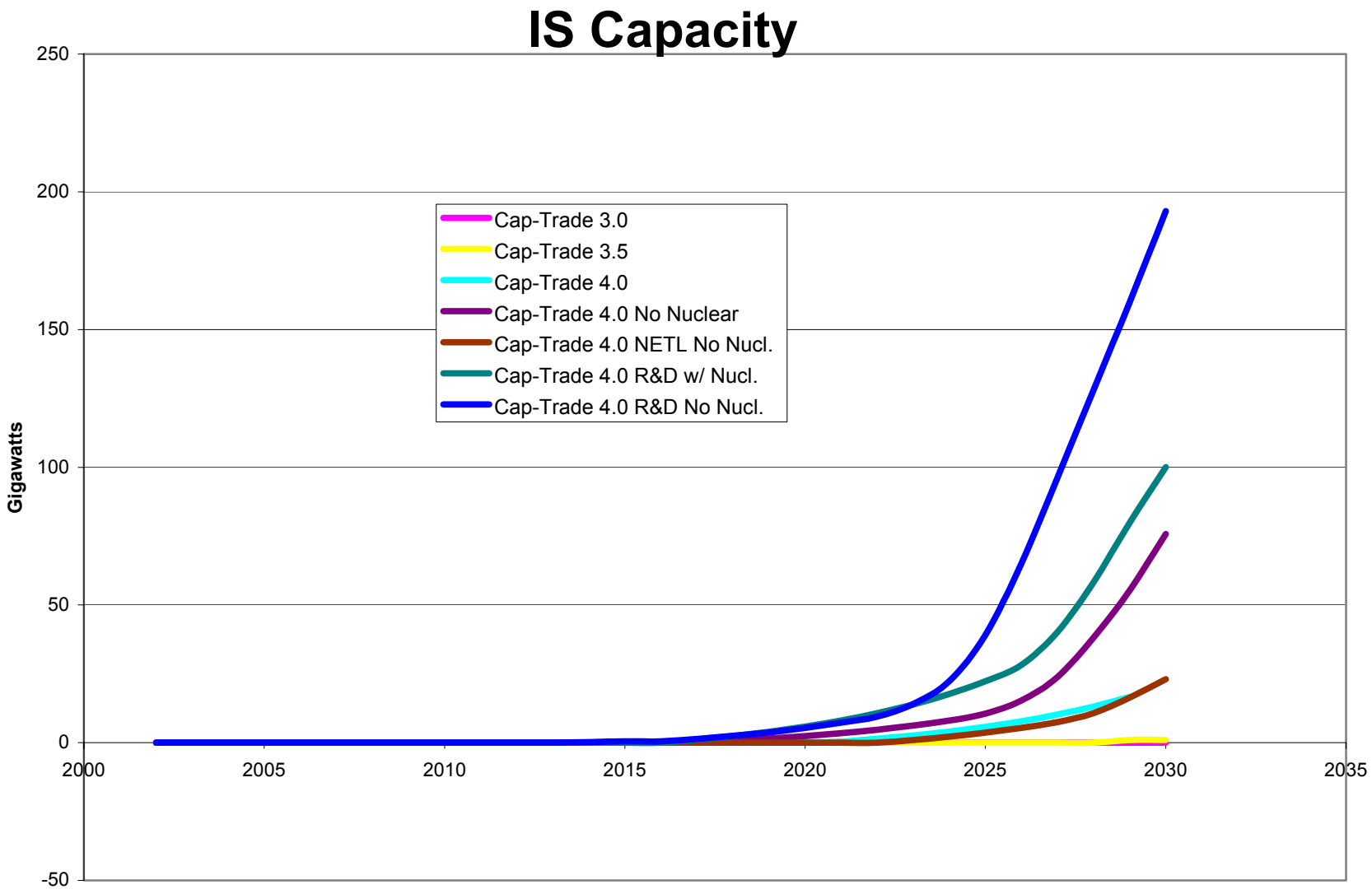
Salazar Legislation

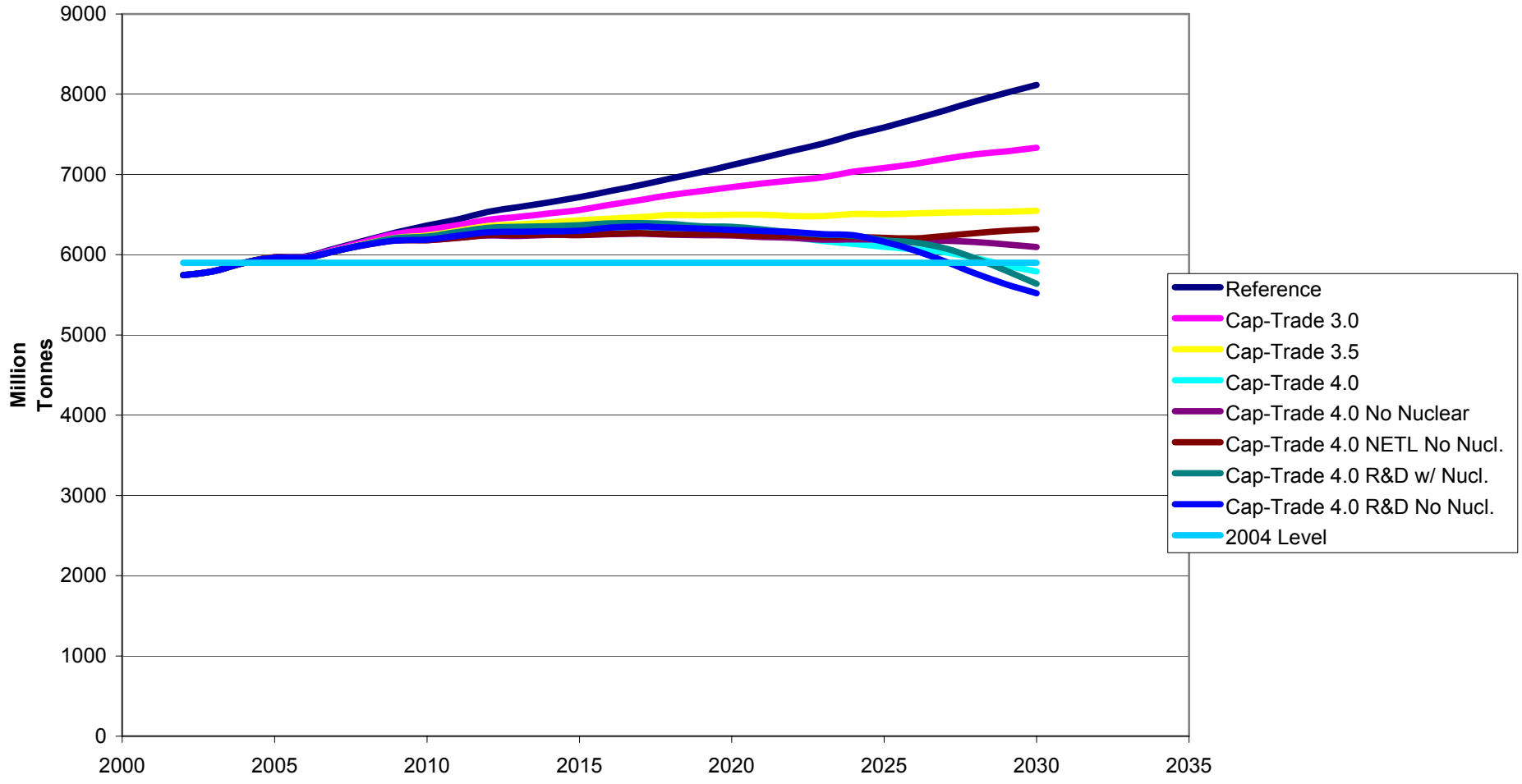
- EIA asked to perform NEMS analysis on various carbon cap scenarios in the power generation sector
- Caps initiated in 2010, slightly escalate beyond inflation (5%)
- 3.0 case begins with $8.83 in 2010, ends with $14.13 in 2030
- 3.5 case begins with $22.09 in 2010, ends with $35.34 in 2030
- 4.0 case begins with $30.92 in 2010, ends with $49.47 in 2030
- All Salazar and IS cases are based off of the AEO2006 Reference Case

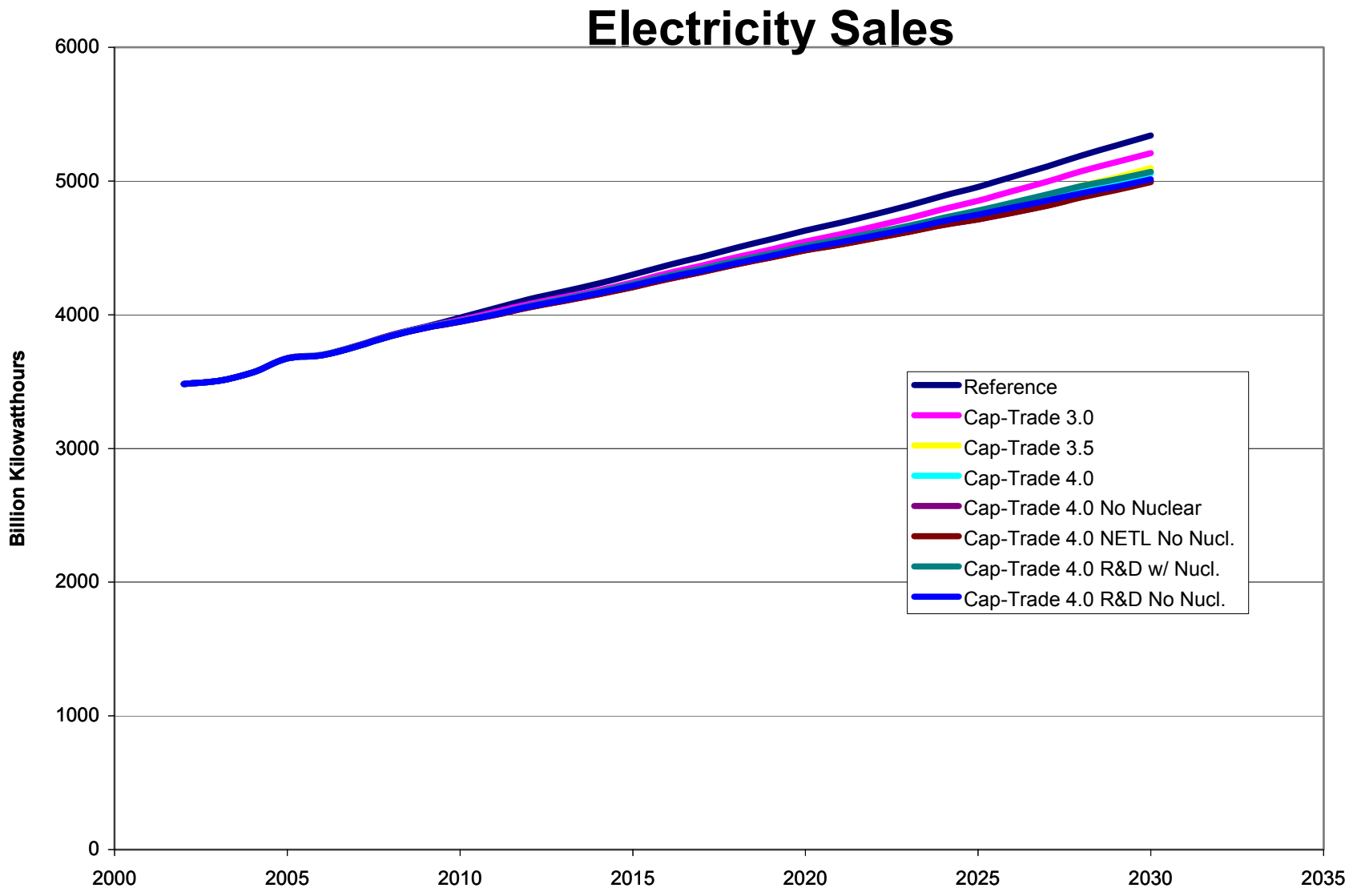
Additional IS Scenarios

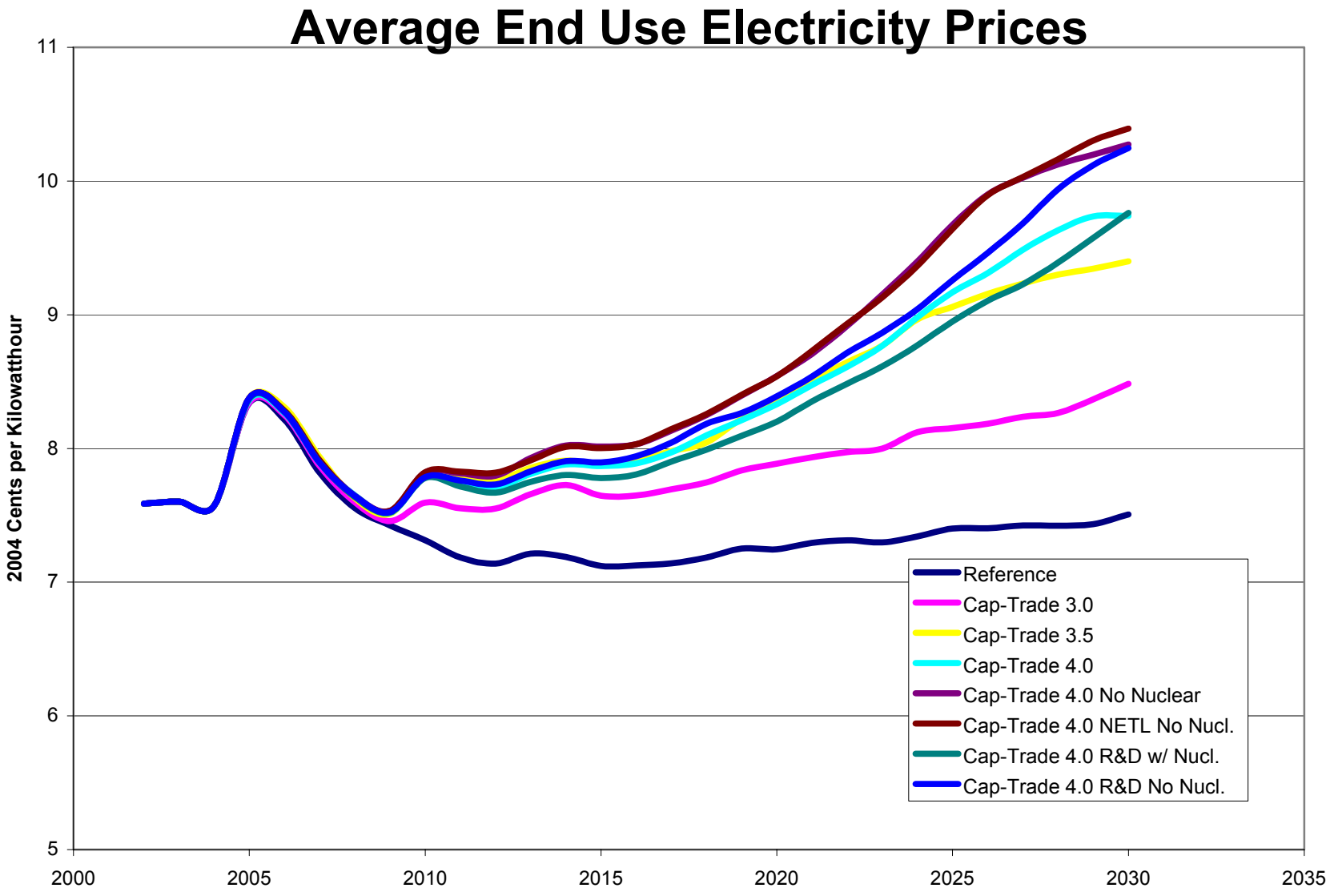
- EIA current IS cost data, not allowing nuclear power expansion
- Updated NETL data, not allowing nuclear power expansion
- NETL Aggressive R&D data, with nuclear power expansion
- NETL Aggressive R&D data, not allowing nuclear expansion

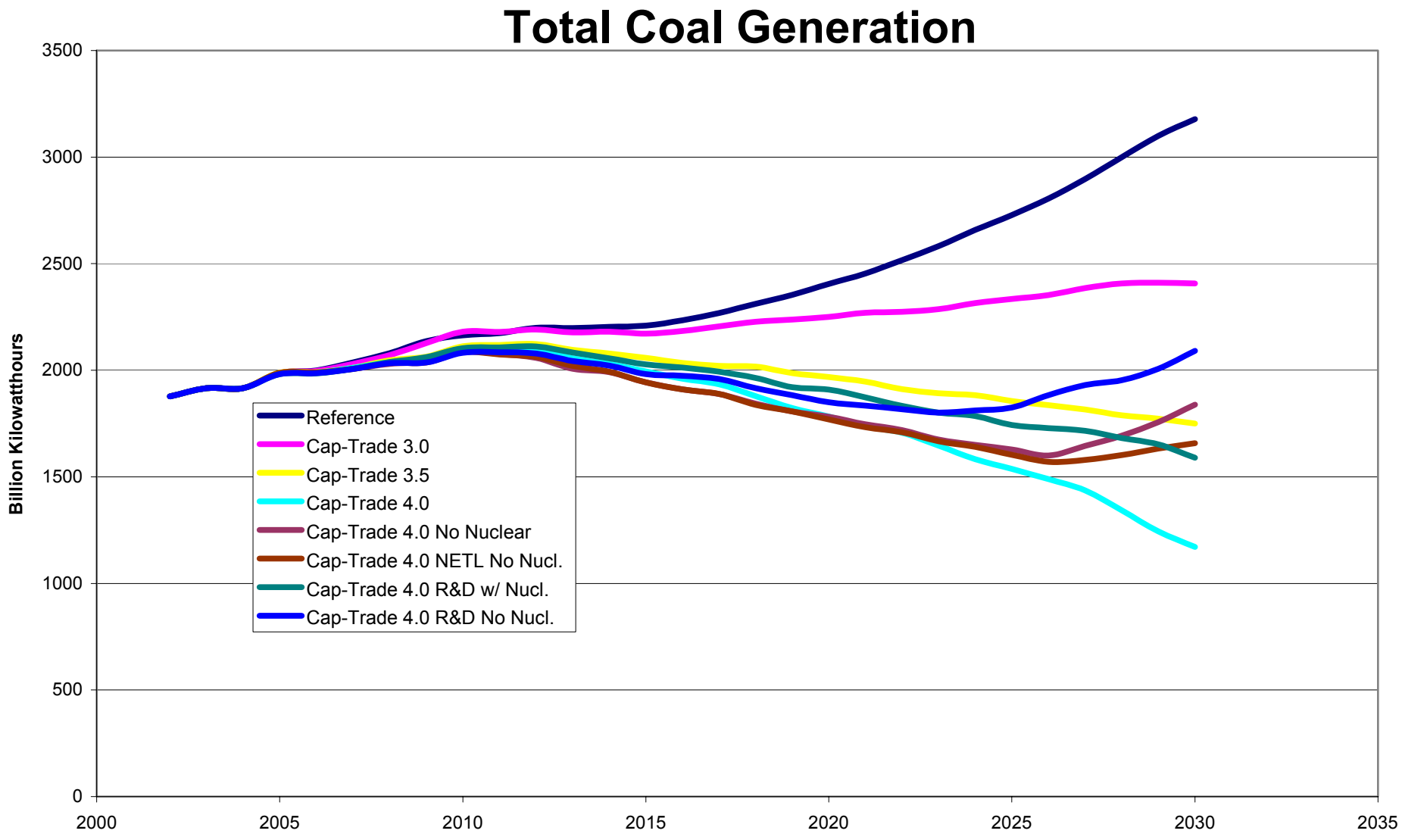

IS Capacity
Gigawatts
250
200
150
100
50
0
-50
2000
2005
2010
2015
2020
2025
2030
2035
Cap-Trade 3.0
Cap-Trade 3.5
Cap-Trade 4.0
Cap-Trade 4.0 No Nuclear
Cap-Trade 4.0 NETL No Nucl.
Cap-Trade 4.0 R&D w/ Nucl.
Cap-Trade 4.0 R&D No Nucl.

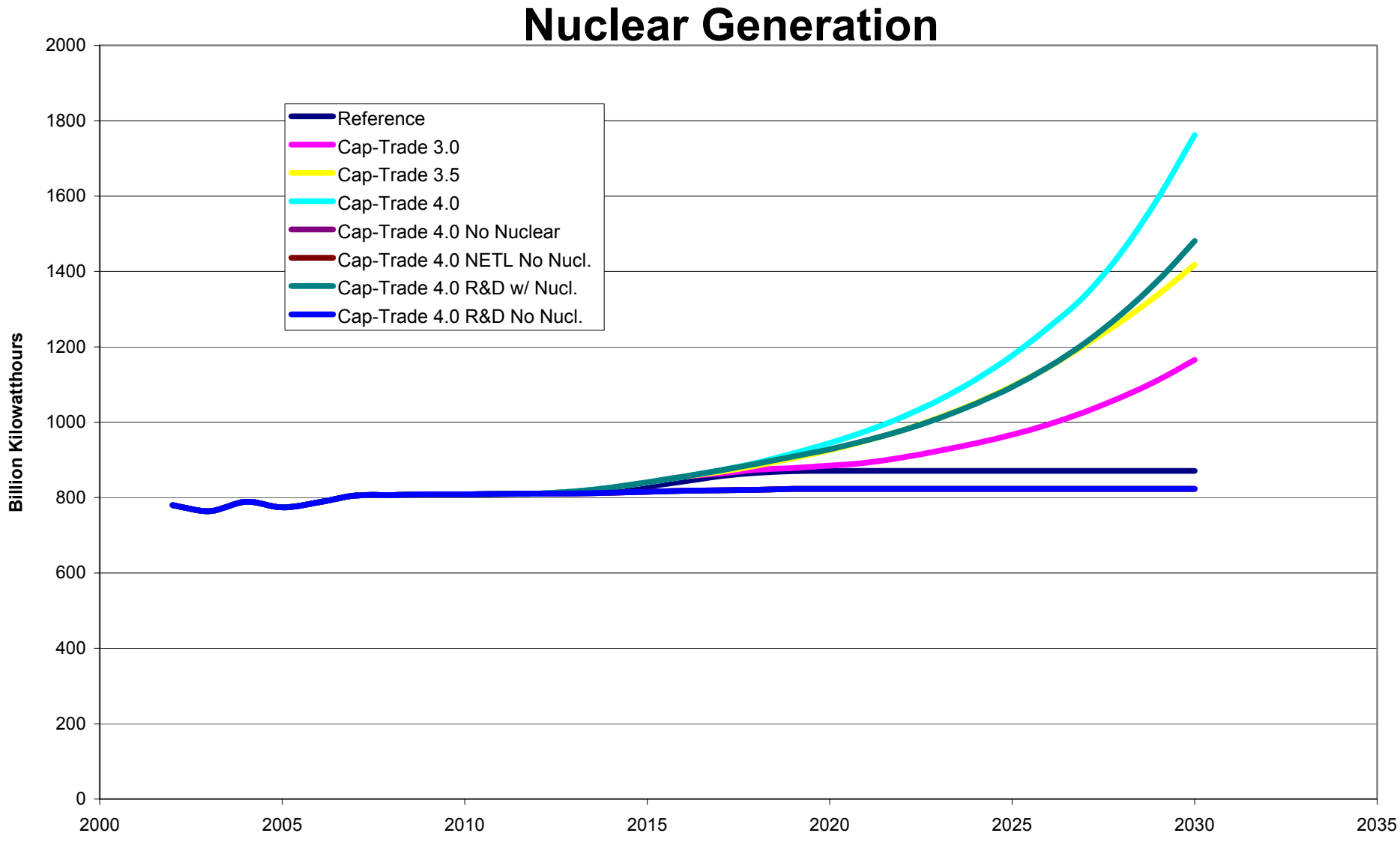
Energy CO2 Emissions



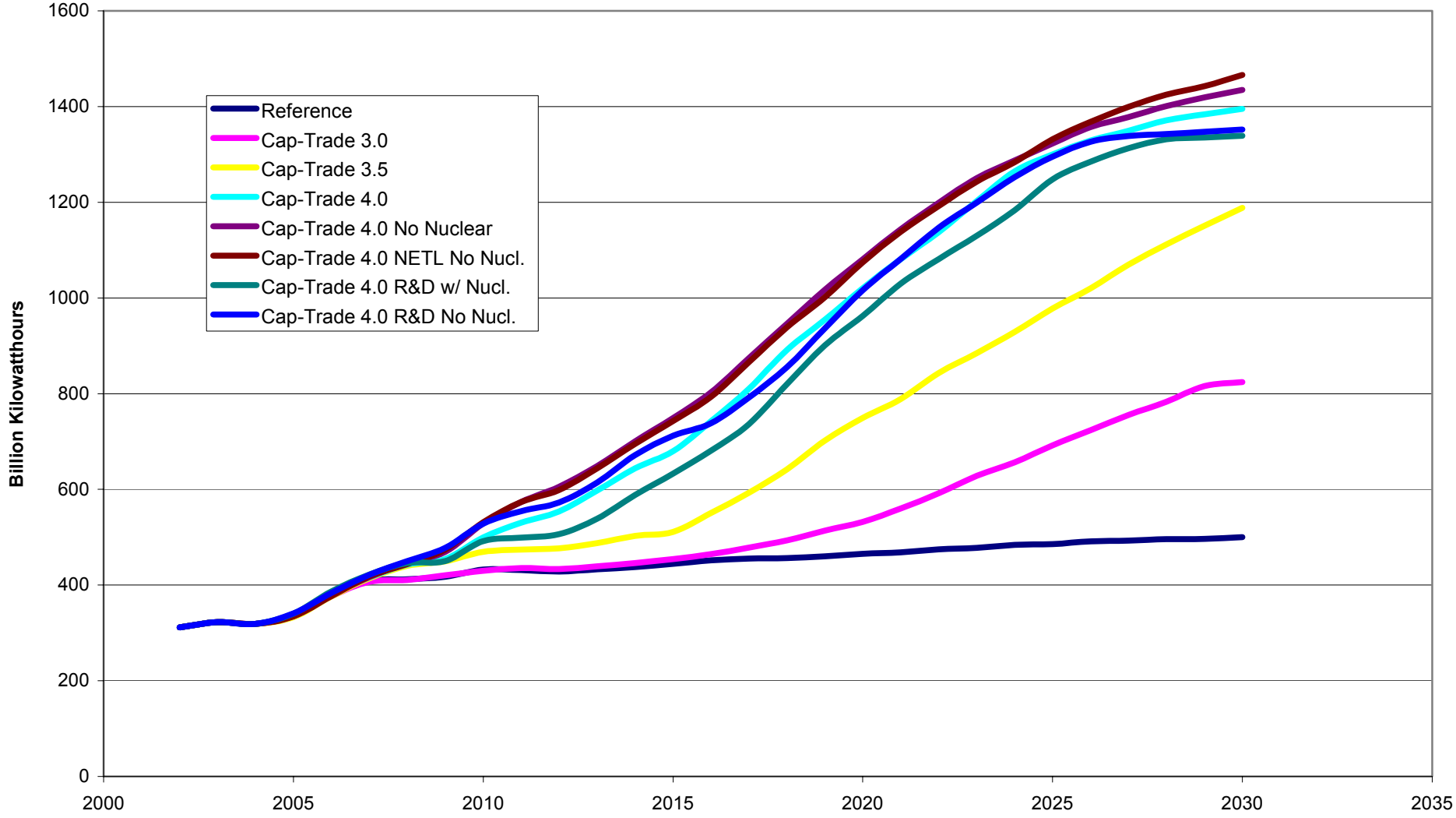

Electricity Sales
Billion Kilowatthours
6000
5000
4000
3000
2000
1000
0
2000
2005
2010
2015
2020
2025
2030
2035
Reference
Cap-Trade 3.0
Cap-Trade 3.5
Cap-Trade 4.0
Cap-Trade 4.0 No Nuclear
Cap-Trade 4.0 NETL No Nucl.
Cap-Trade 4.0 R&D w/ Nucl.
Cap-Trade 4.0 R&D No Nucl.

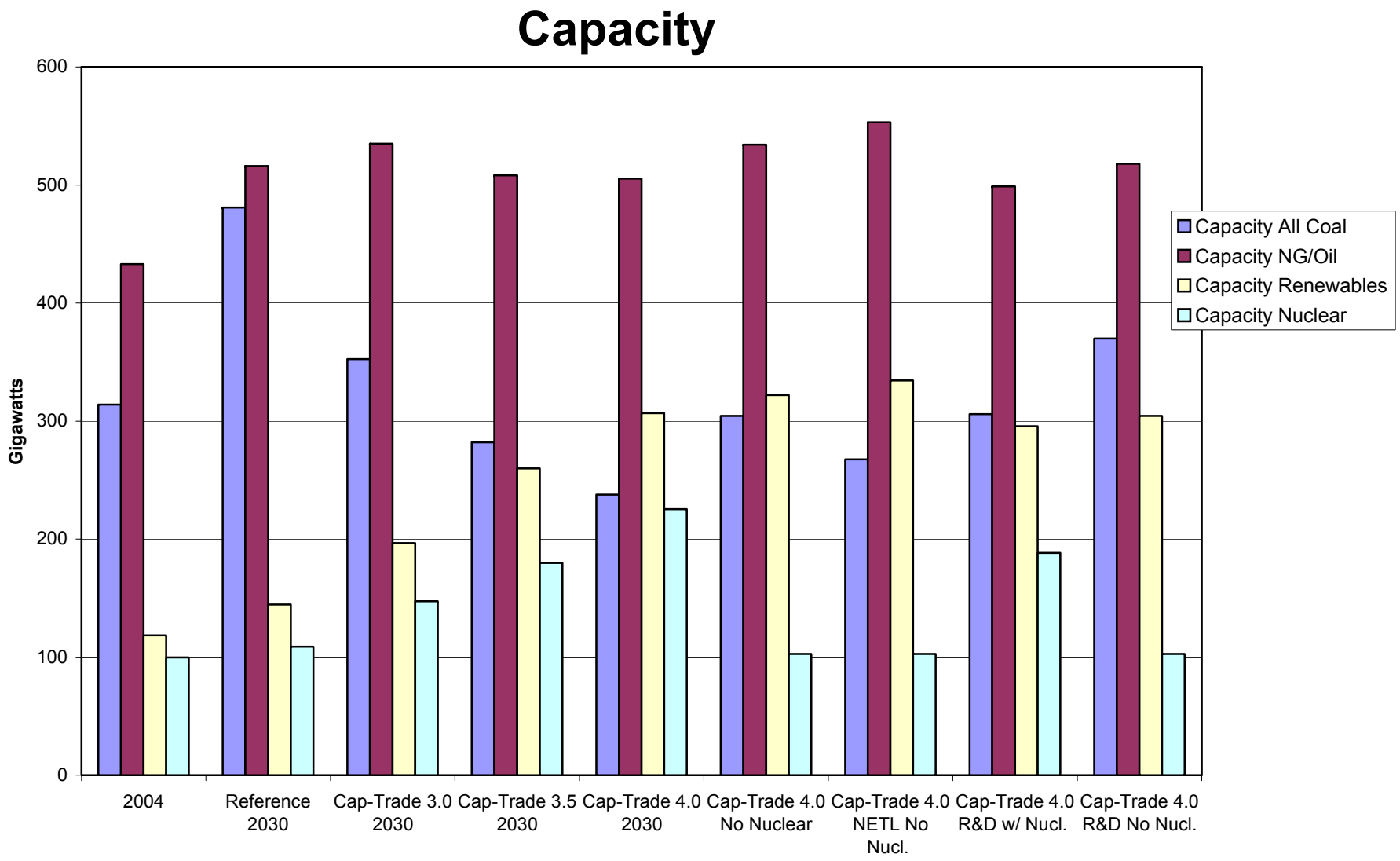

Average End Use Electricity Prices
2004 Cents per Kilowatthour
11
10
9
8
7
6
5
2000
2005
2010
2015
2020
2025
2030
2035
Reference
Cap-Trade 3.0
Cap-Trade 3.5
Cap-Trade 4.0
Cap-Trade 4.0 No Nuclear
Cap-Trade 4.0 NETL No Nucl.
Cap-Trade 4.0 R&D w/ Nucl.
Cap-Trade 4.0 R&D No Nucl.


Total Coal Generation
Billion Kilowatthours
3500
3000
2500
2000
1500
1000
500
0
2000
2005
2010
2015
2020
2025
2030
2035
Reference
Cap-Trade 3.0
Cap-Trade 3.5
Cap-Trade 4.0
Cap-Trade 4.0 No Nuclear
Cap-Trade 4.0 NETL No Nucl.
Cap-Trade 4.0 R&D w/ Nucl.
Cap-Trade 4.0 R&D No Nucl.


Nuclear Generation
Billion Kilowatthours
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2000
2005
2010
2015
2020
2025
2030
2035
Reference
Cap-Trade 3.0
Cap-Trade 3.5
Cap-Trade 4.0
Cap-Trade 4.0 No Nuclear
Cap-Trade 4.0 NETL No Nucl.
Cap-Trade 4.0 R&D w/ Nucl.
Cap-Trade 4.0 R&D No Nucl.

Renewable Generation




Capacity
Gigawatts
600
500
400
300
200
100
0
2004
Reference 2030
Cap-Trade 3.0 2030
Cap-Trade 3.5 2030
Cap-Trade 4.0 2030
Cap-Trade 4.0 No Nuclear
Cap-Trade 4.0 NETL No Nucl.
Cap-Trade 4.0 R&D w/ Nucl.
Cap-Trade 4.0 R&D No Nucl.
Capacity All Coal
Capacity NG/Oil
Capacity Renewables
Capacity Nuclear

Conclusions

- In a carbon constrained world, NEMS predicts nuclear and renewable generation will show the most growth under current costs estimates.
- In the aggressive R&D scenario that allows nuclear power construction, slightly more (100GW) IS is built relative to additional nuclear power capacity (88GW).
- All of the 4.0% carbon intensity target scenarios build new IS capacity.
- IS construction is necessary for zero-emission generation growth without relying on massive nuclear power builds and exhausting the renewable energy supply curve.

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