WCA Sustainable Business Conference

Moving New York to a Low-Carbon Future

How Can We Get There?

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New York State Low-Carbon Future: The Law

New York Climate Leadership and Community Protection Act (s6599) - signed into law June 2019

- **By 2030, a minimum of 70% of electricity generation to be from renewable sources**
- **By 2040, 100% of electricity from non-hydrocarbon sources**
- **Formation of Climate Action Council tasked with publishing interim report within two years of passage, and then every five years afterword.**

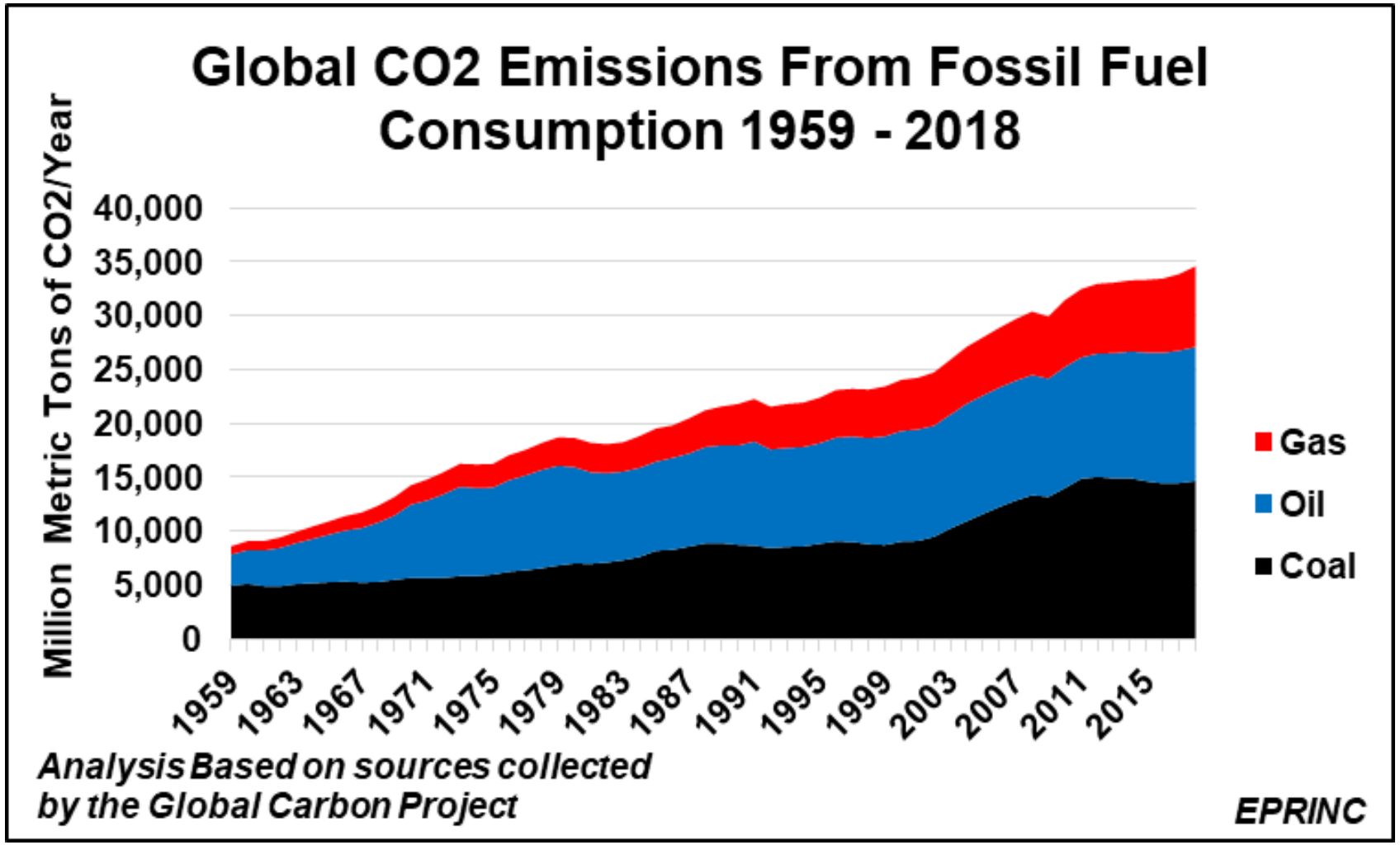
In January 2019, Governor Cuomo called for the development by 2035

- **of 9,000 megawatts of offshore wind energy**
- **of 6,000 megawatts of solar energy**

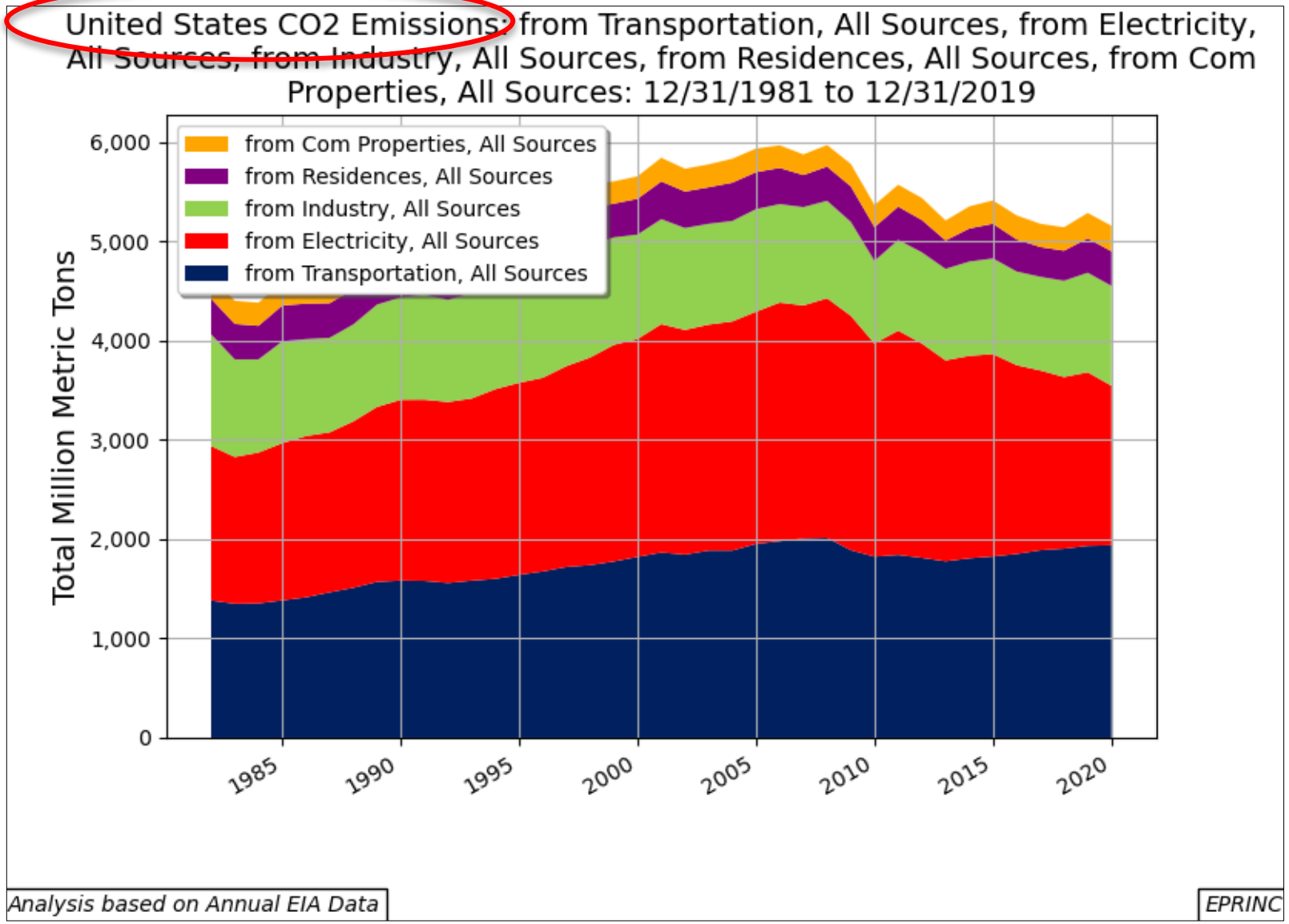
Global Atmospheric Composition

Atmosphere composition (excluding water vapor)		
	Billion Metric Tons	Percentage
Nitrogen	4,015,440	78.00%
Oxygen	1,075,932	20.90%
Argon	47,876	0.93%
CO_2	2,111	0.04%
RoA	6,641	0.13%
	5,148,000	100.00%

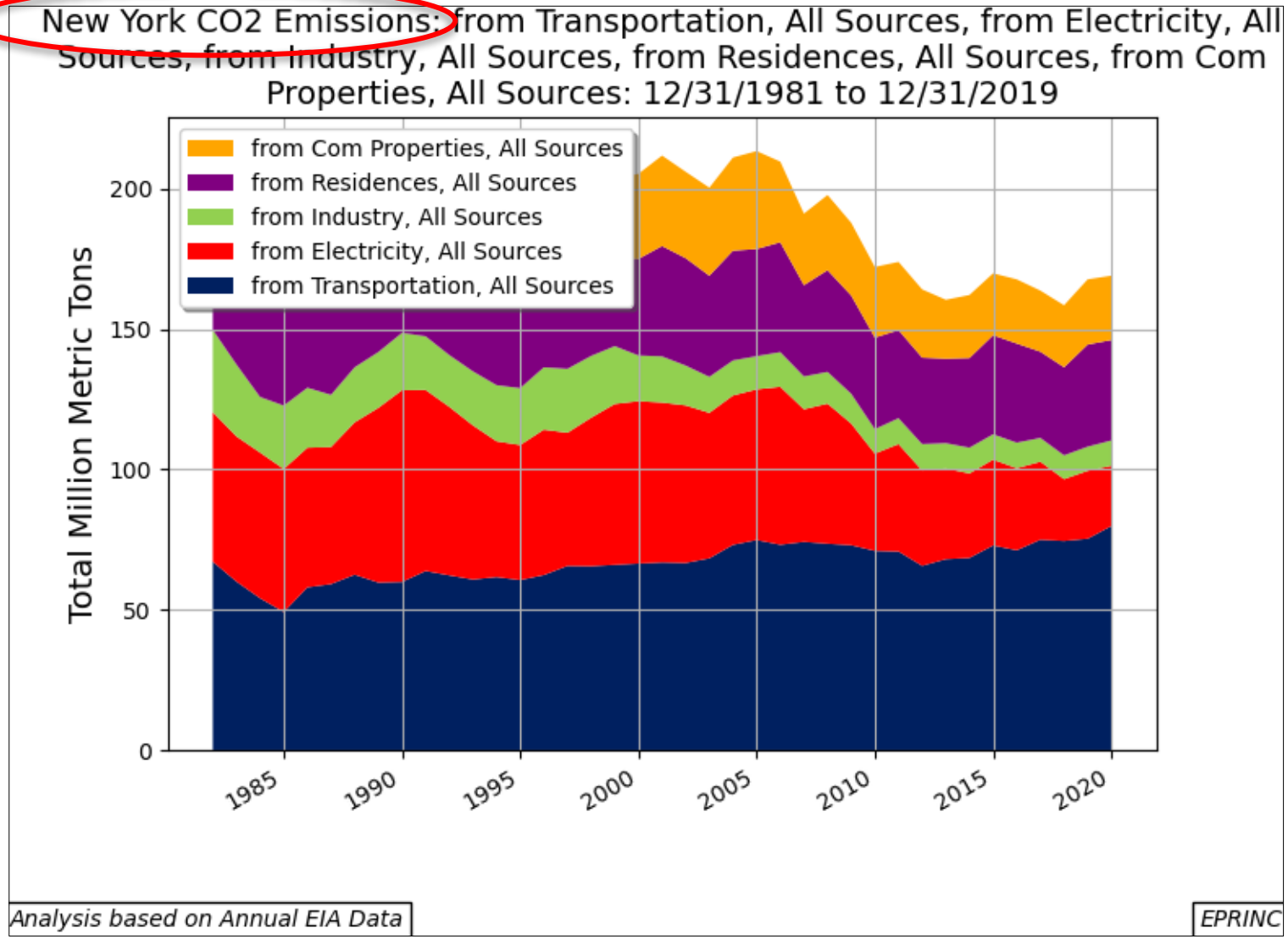
Global Hydrocarbon Fuel CO_2 Emissions by Source



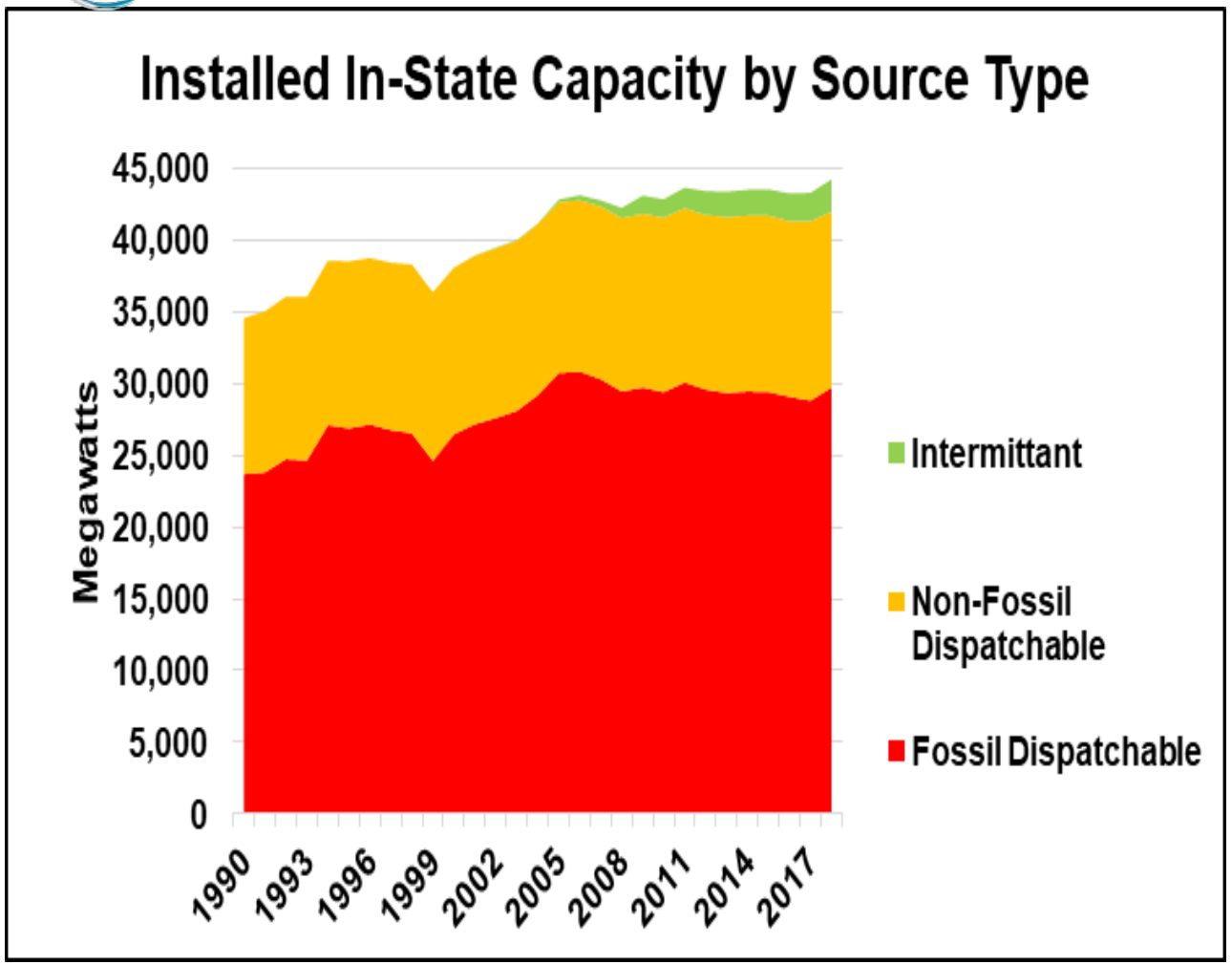
Global CO2 Emissions by Fossil Fuel Group	Million Metric Tons	Percentage of Global CO_2
Gas	7,485.2	0.35%
Oil	12,425.5	0.59%
Coal	14,680.4	0.70%
	36,441.2	1.73%

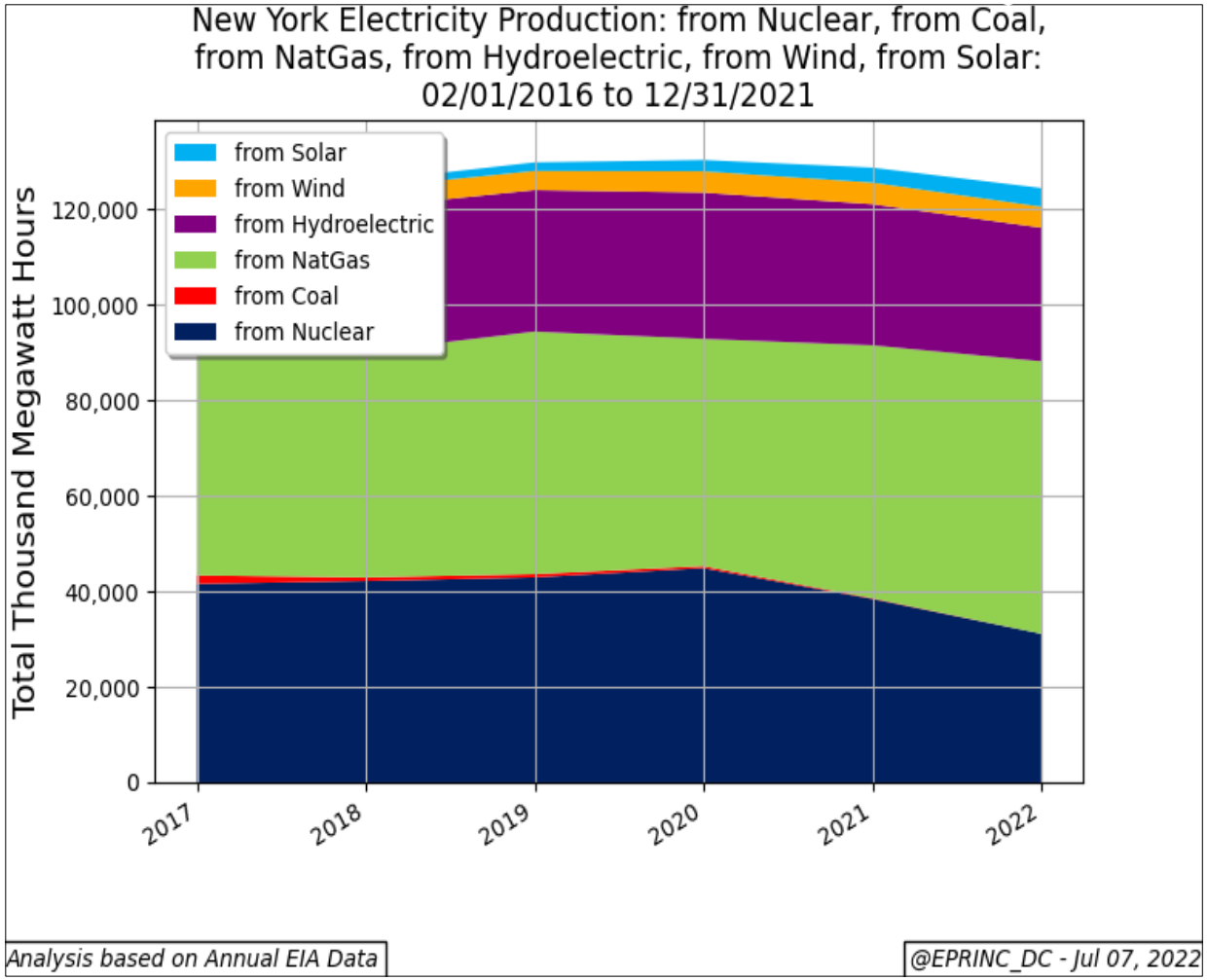


U.S. CO2 Emissions by Sector		
	Million Metric Tons	Percentage of Global CO_2
Com	257.4	0.01%
Res	347.9	0.02%
Electricity	1,607.5	0.08%
Transportation	1,939.5	0.09%
Industry	1,006.6	0.05%
	5,158.8	0.24%

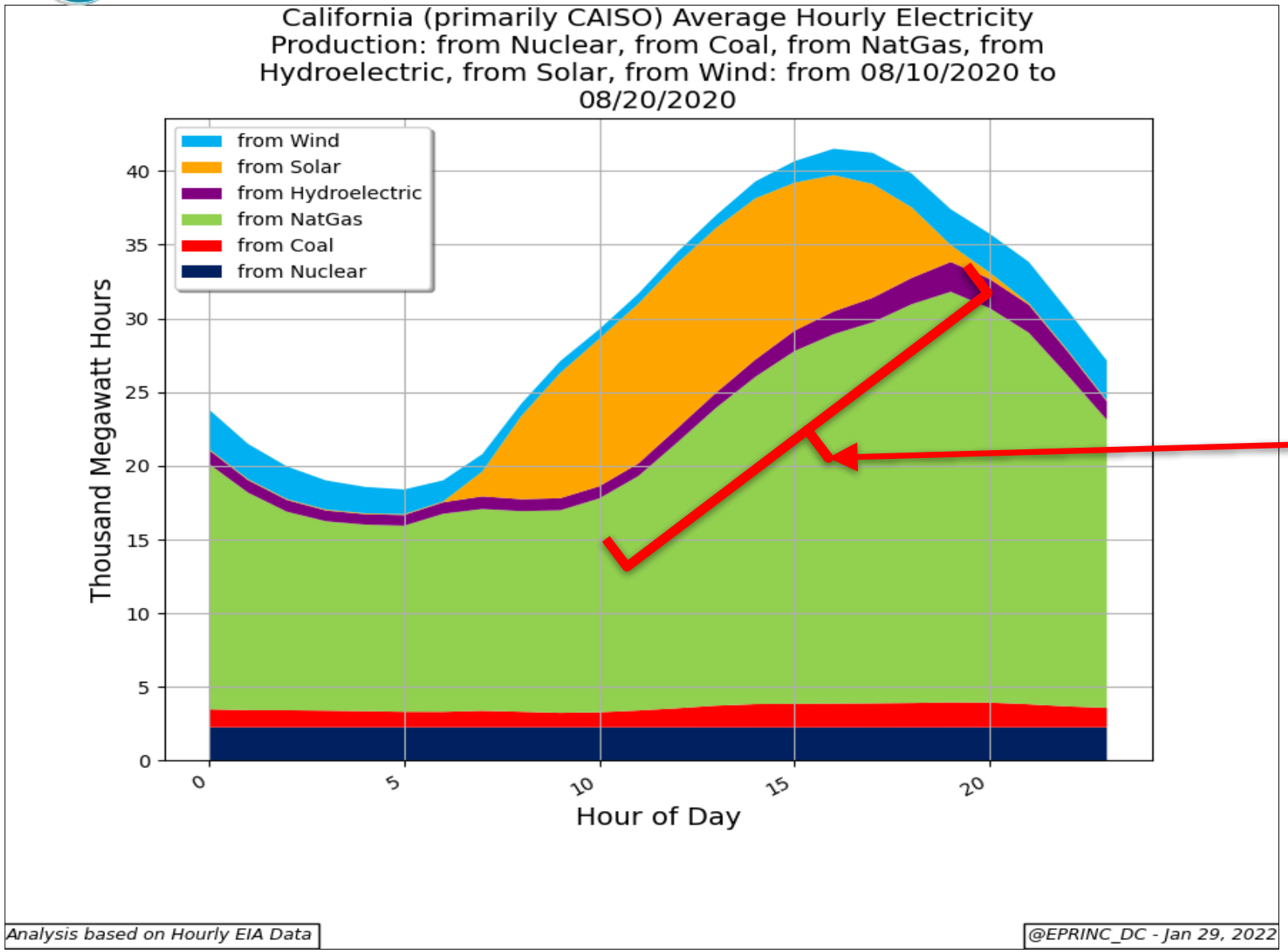


New York State CO2 Emissions by Sector		
	Million Metric Tons	Percentage of Global CO_2
Com	22.9	0.00%
Res	35.7	0.00%
Electricity	21.4	0.00%
Transportation	79.8	0.00%
Industry	9.0	0.00%
	169.0	0.01%



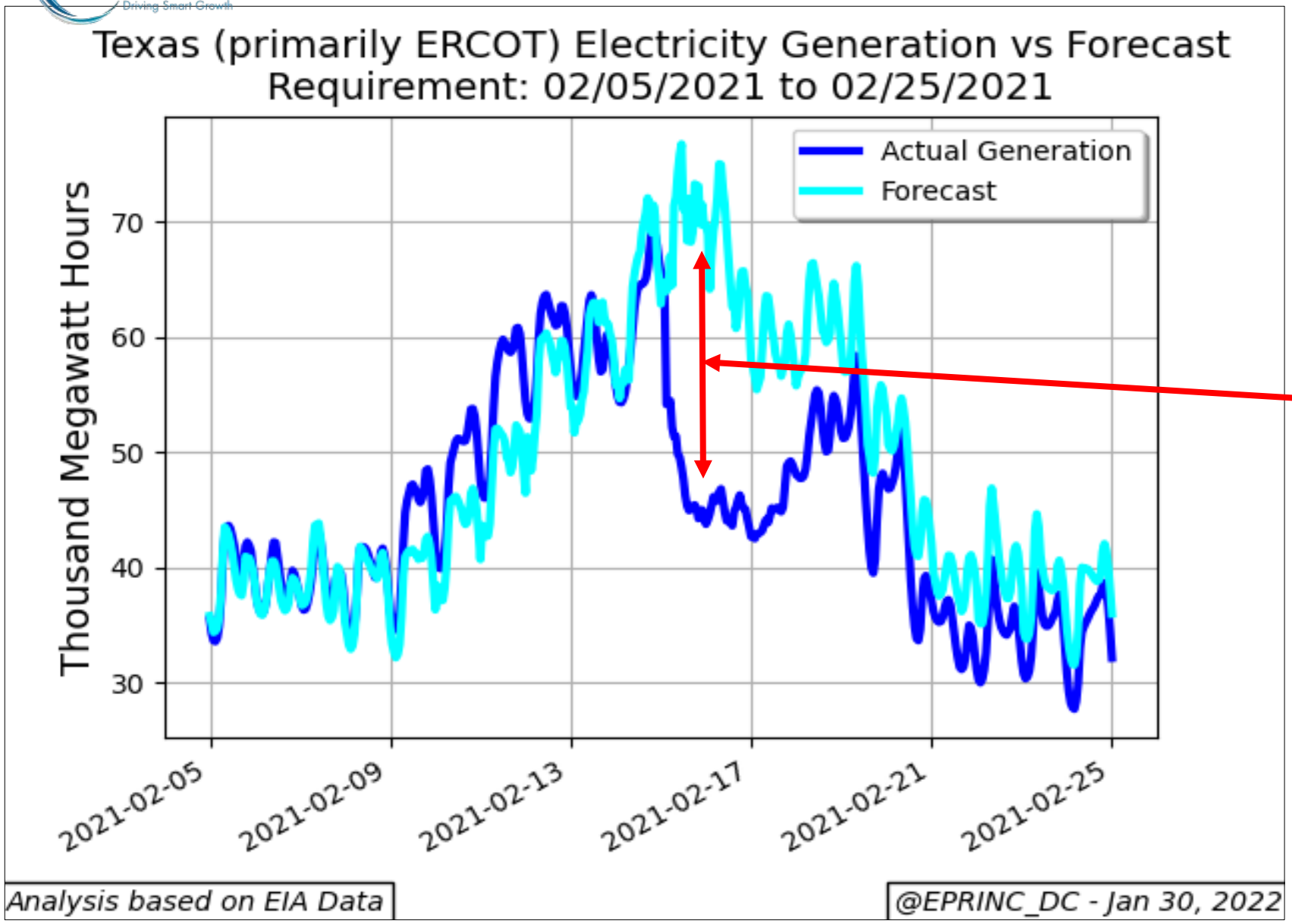


California: Mid-August 2020 Power Generation Shortfall



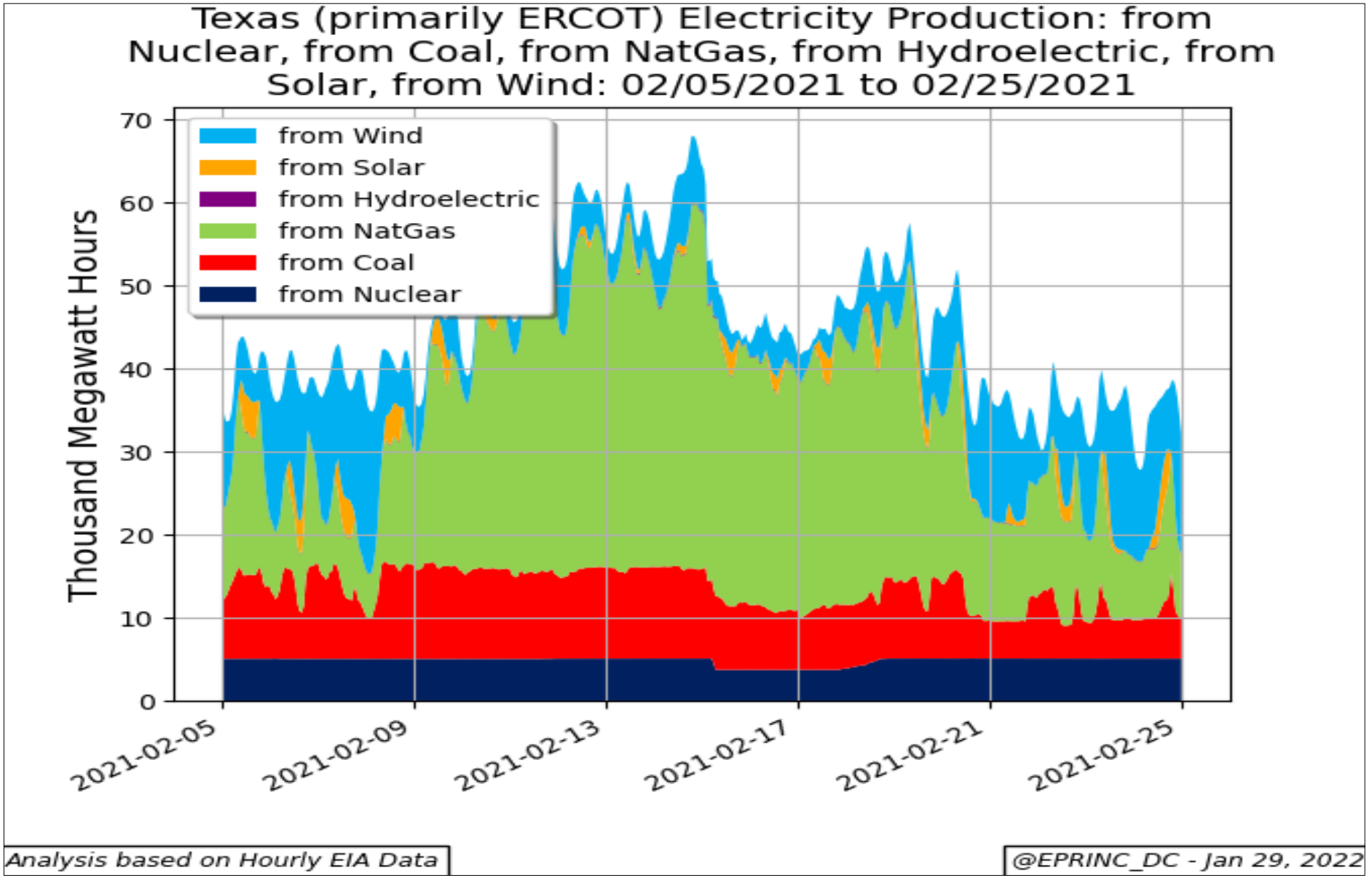
The (in)famous California PowerGen duck curve: late afternoon / evening demand requires a 16,000 MW ramp in seven hours. Or 40 MW/minute. Only natural gas power can deliver at this rate.

Texas: Feb 13, 2021 – Feb 17, 2021 Winter Storm Uri



Over 25,000 megawatt hour shortfall in generation requirements at the peak of the crisis.

Texas: Feb 13, 2021 – Feb 17, 2021 Winter Storm Uri



Concepts and Conclusion

Resilience

- **the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions**
- **The basis of statistics: what can be measured, can be improved. The absence of measurement, limits the effectiveness of governance. There is a great deal of research and numerous proposals. But there are no set electricity resilience standards.**

Local Events

Conclusion: In New York State will it be possible to continue to provide affordable and reliable electricity from a resilient grid generated by intermittent sources?