Regional Energy Policy: Leadership for the Nation

Gerald M. Stokes

Associate Lab Director BNL

President NY Energy Policy Institute

BROOKHAVEN NATIONAL LABORATORY

a passion for discovery

Office of Science U.S. DEPARTMENT OF ENERGY

Climate: Two answers and a path forward

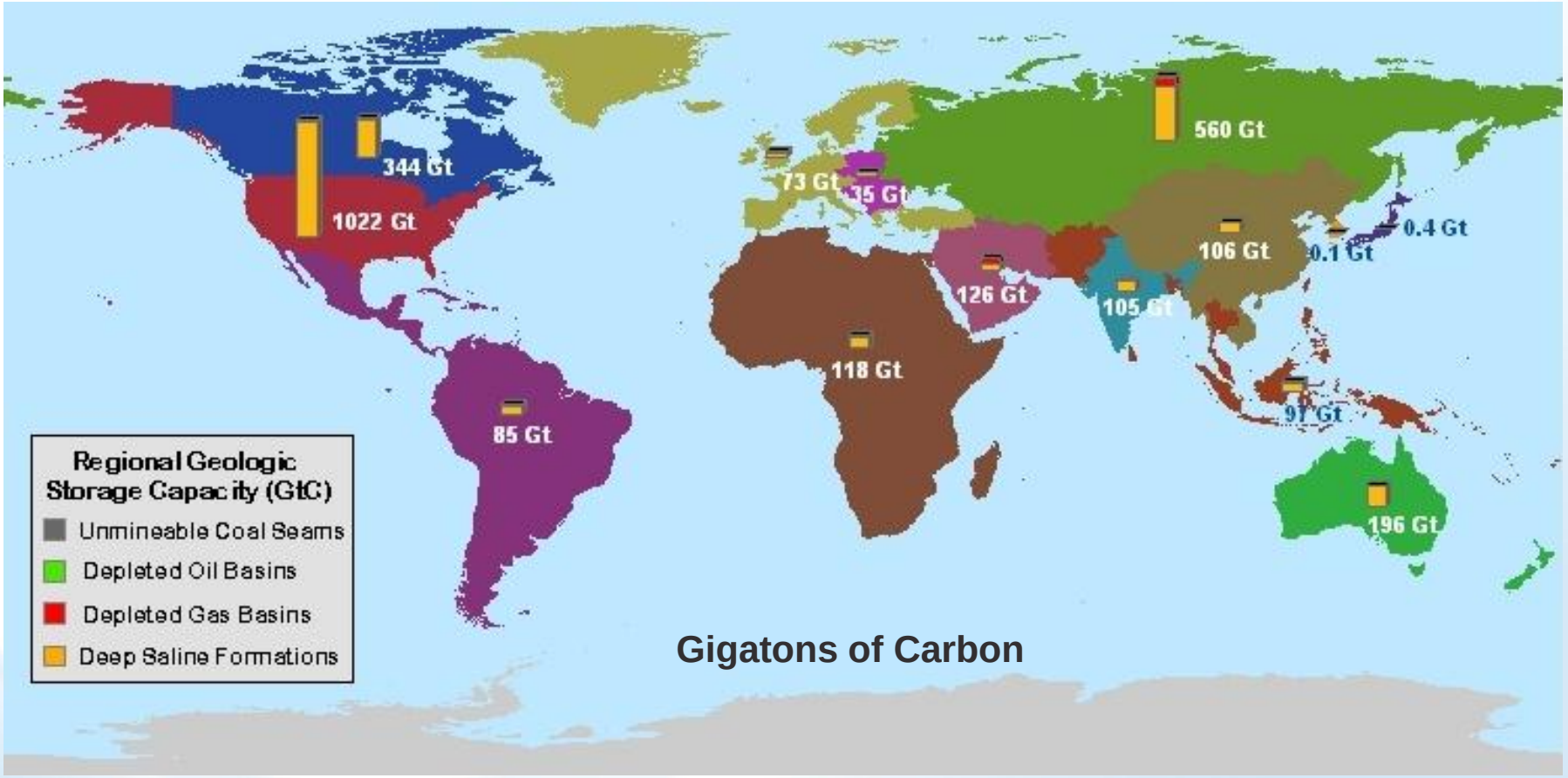
- The climate is changing and humanity is in part responsible, particularly over the last 50 years.
  - "The Detection and Attribution Problem"
- If we are to mitigate the human impact, there must be a substantial change in society's technological infrastructure, most notably in energy
  - "The Carbon Management Problem"
- Most nations are in the early stages of implementing their responses to this challenge – both mitigation and adaptation - how do they decide what to do?

The path forward is fragmented

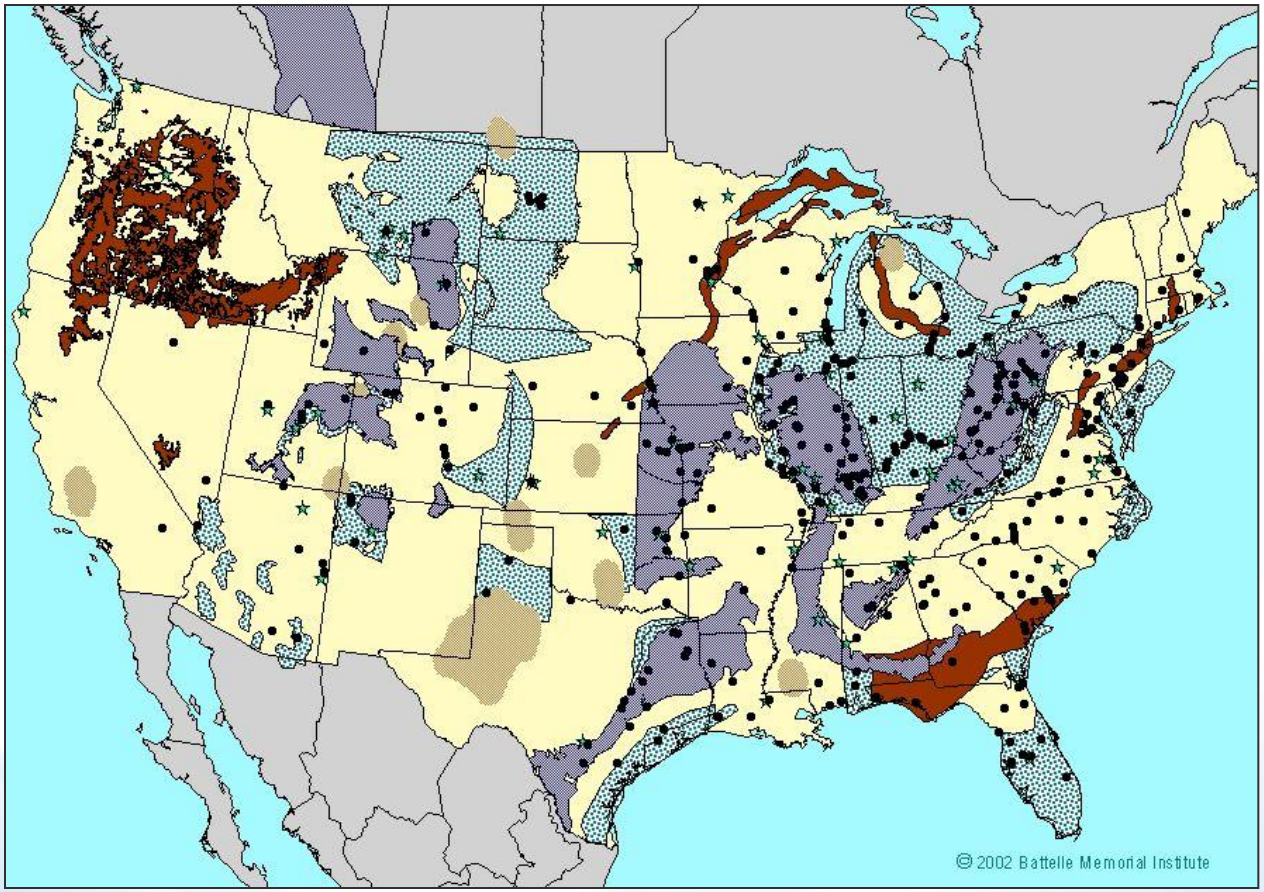
- Usually discussed in terms of Kyoto, non-Kyoto, and developing nations … not the biggest source of fragmentation.
  - Although initially the distinction between big emitters and small emitters is important
- Geography is a much bigger source of fragmentation, particularly when considering implementation of mitigation and adaptation strategies

Why is this?
The response tools are distributed non-uniformly

For example: Global CO_2 Storage Capacity:
A Very Heterogeneous Natural Resource

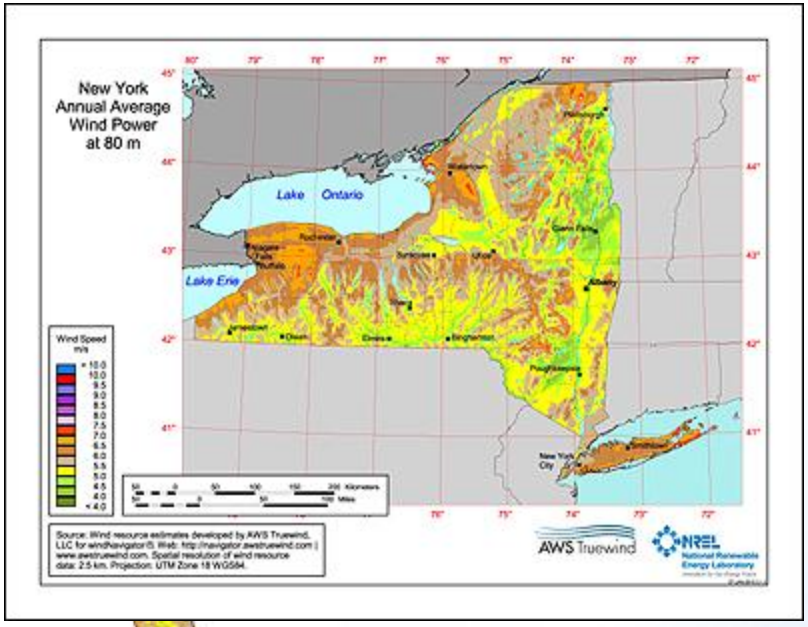


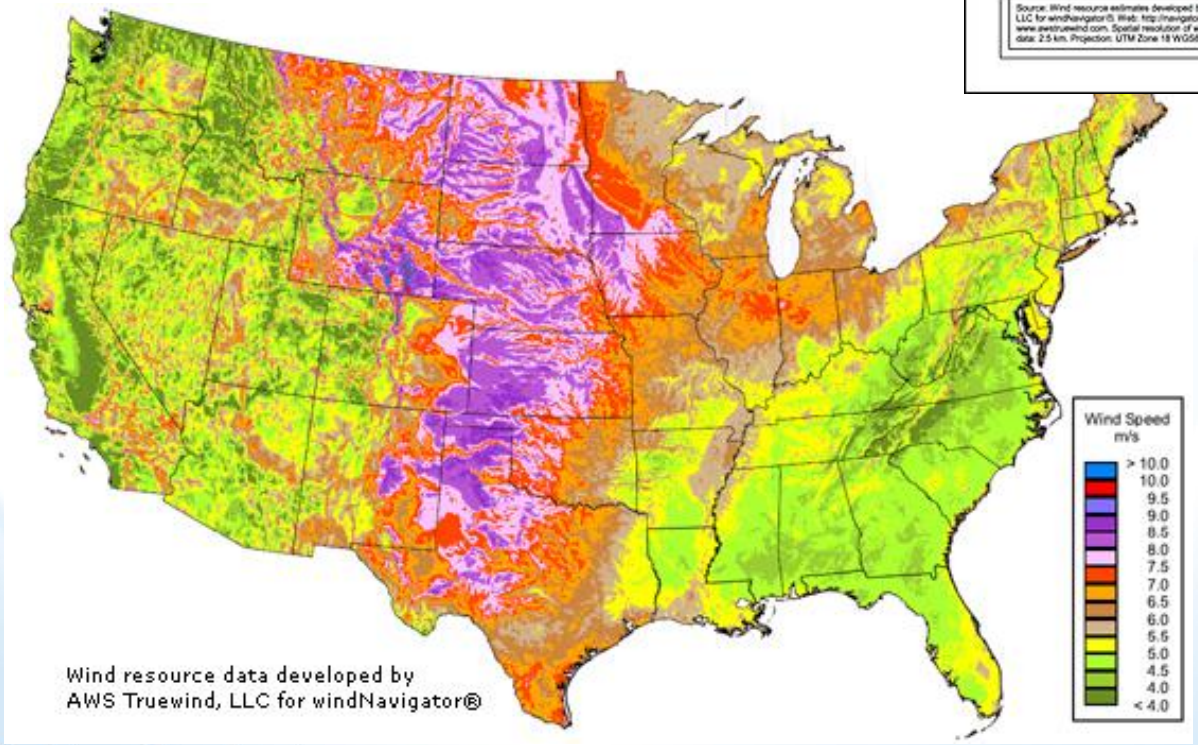
Even within countries the asset is not uniformly distributed



- There is some mismatch between capture and storage and existing power plants
- Even more so for motor vehicles.

Further, wind, like all renewables, is regional





Therefore GHG mitigation and adaptation have to be regional

- Energy demand: regional
- Economic influences – jobs, taxes … : regional
- Renewable Energy: Distinctly regional character
- CO2 storage: Local resource
- Externalities (air quality, renewable portfolio standards etc.): regional
- Off-sets like terrestrial sequestration: regional
- Limiting resources (like water) are regional
- Impacts and adaptation: distinctly regional
- Politics: always local

Therefore and not surprisingly –

Greenhouse Gas mitigation is an active area in the states …

- Historically in the United States environmental leadership has come from the states.
- 31 states have completed climate actions plans and planning is continuing in 4 others.
- Even with a national policy, the burden of implementation will fall to the states – in particular dealing with the economic consequences – both positive and negative – will occur at the state level.

When you get regional – you have to ask what you are using energy for?

Sector	CO2 Emissions (MMT CO2)		Notes
	Current (2007)	BAU (2050)	
Residential	37.6	45.0	567x10^6 MBTU Gas 154x10^6 MBTU Liquid
Commercial	27.2	39.1	431x10^6 MBTU Gas 156x10^6 MBTU Liquid
Industrial	19.0	24.1	79x10^6 MBTU Gas 21x10^6 MBTU Liquid 80x10^6 MBTU Coal/Coke
Transportation	**88.3**	**126**	14.8x10^9 VMT HDV 209.2x10^9 VMT LDV
Electricity	49.2	83.3	271,000 GWh R-88.2; C-140; I-36.3; T-6.2
Other	28.8	43.0	SF6; NG leaks; MSW; HFC
Total	250.2	360.5	

Note: 1990 emissions = 277 MMT CO2e
Making the goal 55.4 MMT CO2e

A scenario analysis suggests several ways for NYS to meet its goal …

Sector	Ultraviolet	Deep Blue	Yellow	Baseline	Notes
Residential	0	0	7.5	37.6/45.0	
Commercial	0	0	4.5	27.2/39.1	
Industrial	12.7	12.7	14.1	19.0/24.1	
Transport	20.1	20.1	51	88.3/126	
Electricity	10	13	24	49.2/83.3	
Other	12.3	12.3	12.3	28.8/43.0	
Total	55.1	58.1	113.4	250.2/360.5	Goal – 55.4

- Transport and Industrial (most of other) emissions get the largest share
- CCS and nuclear are key to reductions in the electric sector
- While presented as zero existing structures will be a major challenge
- We have assumed biofuels are carbon neutral