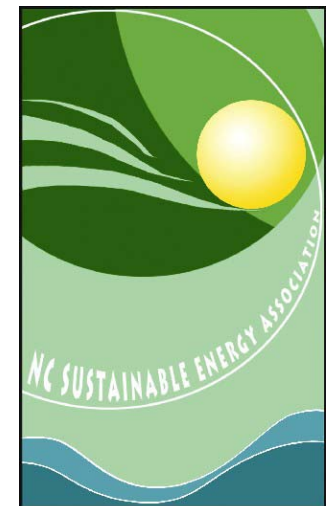


Southeast State Energy Policy: Turning state & global energy challenges into sustainable economic opportunity

Ivan Urlaub, Executive Director
NC Sustainable Energy Association

National Conference of State Legislators, New Orleans, LA
Energy Policy Summit
July 22, 2008



NCSEA



Exciting times for Sustainable Energy!

Rapid Global Clean Energy Development

Consistent global market growth, 2007 record year

- 23% of new power generation capacity in 2007
- Now 5.4% of global installed capacity
- \$148 billion invested in sustainable energy in 2007
- Biomass and waste to energy venture capital +428%
- Banks expect utilities include clean energy in portfolios

Source: International Energy Agency; UNEP "Global Trends in Sustainable Energy Investment 2008"



Exciting times for Sustainable Energy!

Rapid Global Clean Energy Development

Global Clean Energy Industry Trends

- Each year since 1974, nuclear given 3x to 10x more R&D funding than all renewable energy solutions combined
- Since 1975, cost of each renewable resource fallen >70%
- Renewables grown 4x faster than conventional since 2001
- China increased investment 14-fold since 2004
- Europe and Mid East leading corporate R&D

Long-term projections, IEA

- \$2.0+ trillion to be invested globally in new RE by 2030
- Climate stabilization policy double investment to \$4.2 tril

Source: International Energy Agency; UNEP "Global Trends in Sustainable Energy Investment 2008"



Southeast Energy Challenges

Current challenges within Southeast's control

Southeast's current energy challenges

- Rapidly rising natural gas costs >30% in 2008
- Rising utility costs, potentially 16% in 2008
- Gasoline prices motivating fuel switching to electricity
- Southeast most energy inefficient U.S. region
- Southeast emits most greenhouse gases per capita
- Energy poverty
 - 150,000 NC households spend >50% of income on energy
- Water supply and electricity as competing use, drought
- Increasing energy costs rippling into public, private sectors



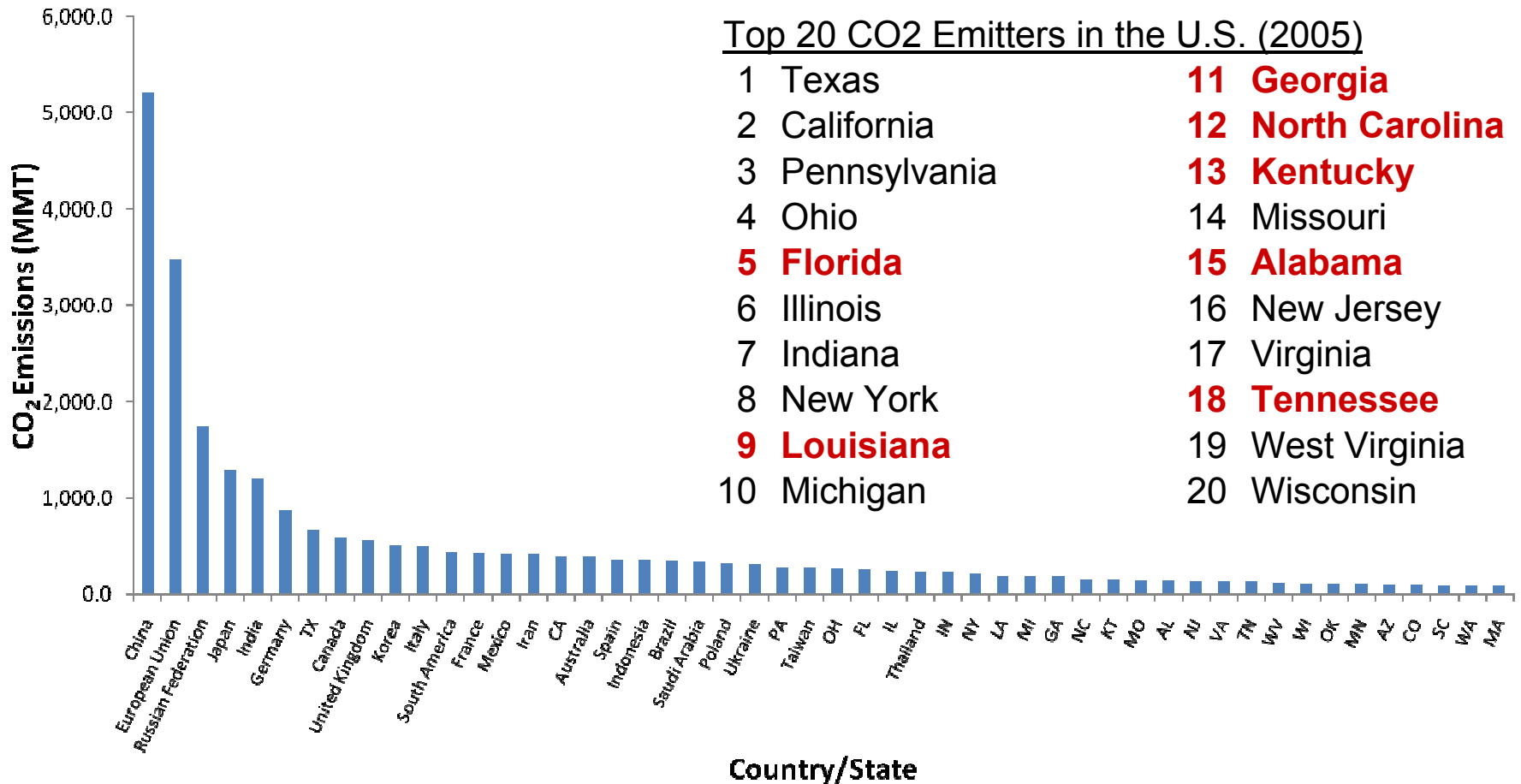
Southeast Energy Challenges

Rising challenges within Southeast's control

Rising energy challenges within Southeast's control

- Census Bureau estimates 25% of US population growth in 4 states: FL, GA, NC and SC
- These 4 states comparable to CA in population, economy, transportation, emit seven times more greenhouse gases
- Infrastructure repair, renovation, expansion
- Southeast has the lowest economic energy productivity
- Land-use policy, competing uses

Southeast Role in Climate Change



- **9 of the 10** southeastern states are top global CO₂ emitters.
- **7 of the 10** southeast states are within the Top 20 emitters in U.S.



Southeast Energy Challenges

Rising challenges within Southeast's control

Megawatt hours to generate \$1 mil in economy

AL = 585 MWh

SC = 580 MWh

GA = 370 MWh

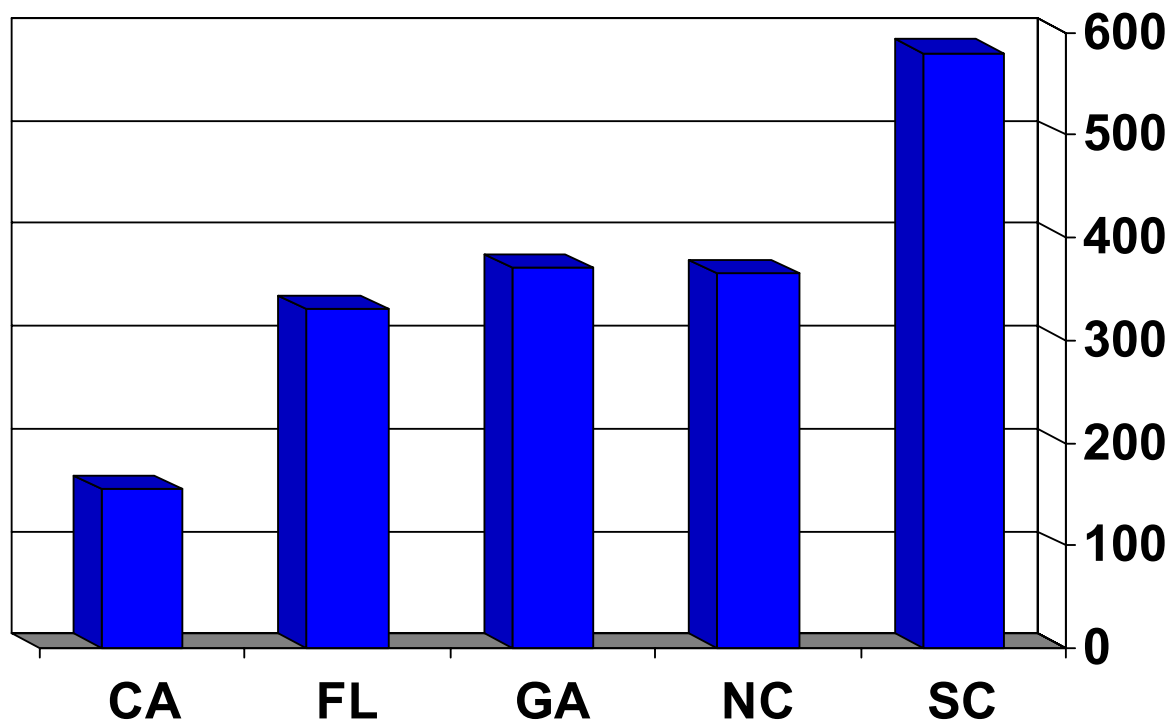
NC = 367 MWh

FL = 330 MWh

US = 290 MWh

CA = 155 MWh

MWh per \$Million Gross State Product



Southeast has 7 of 10 least productive energy economies



Southeast Energy Challenges

Rising challenges outside Southeast's control

Rising energy challenges out of Southeast's control...
but preparation will create opportunity

- Disruptive technologies – electric vehicles; smart grid
- Lack of resiliency, flexibility as we substitute for oil
- Global energy / fuel market variability, supply flows
- Global energy security
- Cost of inputs – steel, labor, water, electronic systems
- Technology bottlenecks
- Carbon regulation / Climate change adaptation
- Pricing in other market risks

How can energy policy turn these challenges into opportunities?

- North Carolina example – policies
- North Carolina example – markets
- How to assess your clean resource
- Policies that remove market barriers





Energy challenges need policy change

Example - North Carolina energy policy changes

- Aggressive renewable energy tax credits – 1990's, increased 2005
- Interconnection standard – 2005, revised 2008
- Determined “green tags” belong to system owner – 2006
- Net Metering Rules – 2005
- NCUC / “La Capra Study” of RPS potential – 2006
- Legislative climate change commission, action plan – 2006
- Included energy efficiency in utility planning – 2007
- Require public buildings reduce energy use 30% in 5 years – 2007
- Cities, counties, HOA's cannot restrict solar power – 2007
- 800 MW coal power plant proposal rejected – 2007
- Renewable Portfolio Standard 12.5% – 2007
- Green Business Fund – 2007, 2008
- Rate structure study – 2007-2008
- Cap on solar energy property tax – 2008



Energy challenges need policy change

North Carolina example – market response

NC Clean Energy Industry turns 180 in response to policy

Then...

- 2004: Solargenix HQ in NC, but locates manufacturing in Chicago to get incentives
- 2006: Tesla Motors chose to not locate 400 manufacturing jobs in NC, CEO cites lack of RPS mandate/energy policy
- 2007: Charlotte-based Sencera dismisses NC for new manufacturing facility, calls NC “backwater of solar energy”

Now...

- 2008: SunEdison to build largest US solar farm in NC
- 2008: Sencera announces \$35 million manufacturing facility in Charlotte, NC, RPS law and attractive long-term market
- 2008: Utilities propose first efficiency, renewable programs



Energy challenges need policy change

North Carolina example – market response

Preliminary NC industry survey results (do not cite/quote):

- Over 2,000 currently employed in NC clean energy industry
- NC clean energy industry grew 18% in 2007 (pre-RPS law)
- Clean energy companies in majority of counties
- Primarily manufacturing jobs
- Small to large businesses
- Rural jobs significant
- Firms are transitioning into clean energy industry

NC Clean Energy Industry Trends

- Existing industry expects >20% growth in 2008
- Installed renewable capacity will likely triple in 2008



RE Potential in the Southeast

Possible clean energy resources

- Energy Efficiency
- Water Efficiency (most of water cost is energy)
- Solar: chillers, photovoltaic, thermal
- Agriculture combustion/gasification
- Agriculture methane-to-energy
- Landfill gas, wastewater treatment
- Biomass combustion/gasification
 - Cofiring, pulping liquor, residues, wastes
- Shallow geothermal / ground source heat pump
- Combined heat-and-power
- Wind power
- Hydropower: micro, re-power, upgrade



Information Resources

References for estimating your resource

- Database of State Incentives for Renewable Energy www.dsireusa.org
- National Renewable Energy Laboratory
- Renewable Energy Resource Atlas
http://www.nrel.gov/gis/maps.html#resource_atlas
- U.S. DOE, EE/RE office
- Berkeley National Laboratory – many studies
- Regulatory Assistance Project
- Secondary sources and consulting firms

Freeing the Grid: 2007 Edition

Grading of state Net Metering, Interconnection

Net Metering

STATE	Grade
IREC Model	A
Colorado	A
New Jersey	A
Pennsylvania	A
Maryland	A
California	A
Oregon	B
Delaware	B
Iowa	B
Connecticut	B
Ohio	B
New Mexico	B
Arkansas	C
New Hampshire	C
Rhode Island	C
Hawaii	C
Maine	C
Louisiana	C
Virginia	C
Minnesota	C
North Dakota	C
Massachusetts	C
Montana	C
Vermont	C
Missouri	C
Washington	D
New York	D
Texas	D
Kentucky	D
Michigan	D
Wyoming	D
Oklahoma	D
Indiana	D
West Virginia	D
Utah	F
D.C.	F
Georgia	F
North Carolina	F
Wisconsin	F

“Turn meter backwards” when produce more than need. Should save everyone money when done right.

North Carolina F

Interconnection

STATE	Grade
IREC Model	A
New Jersey	B
Arizona	B
California	C
Ohio	C
Texas	C
New York	C
Colorado	C
Oregon*	C
Massachusetts	C
Georgia	C
New Mexico*	C
Vermont	C
Minnesota	D
Rhode Island	D
Wisconsin	D
West Virginia	D
Arkansas	D
New Hampshire	D
Virginia	D
Iowa	D
Maryland*	D
Montana	D
Michigan	D
Indiana	D
Pennsylvania	D
Maine	D
Connecticut	D
North Carolina	F
D.C.	F
Wyoming	F
Oklahoma	F
Louisiana	F
Delaware	F
Hawaii	F
Utah	F
Washington	F
Missouri	F

Simple way to connect RE to electric grid. Should save money for utility, rate payers, RE generators when done right.

North Carolina F

Note: NC Utilities Commission recently revised interconnection, grade will improve

Information Resources

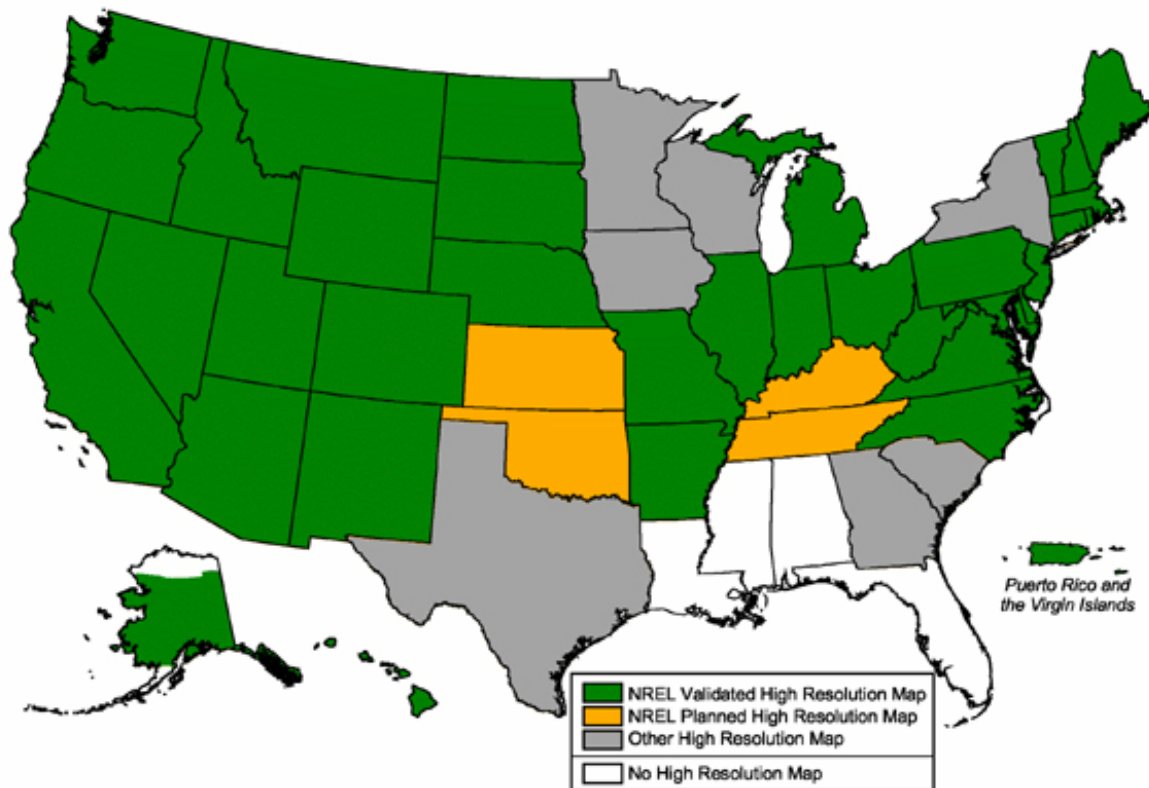
References for estimating your wind resource

State — Wind Resource Maps

Click on a state to go to its wind resource map or you can use the drop down lists below to get to state wind resource maps.

Wind Powering America
map shown here

www.awstruewind.com
funded by GEFA for GA



Validated Maps

Select a State

To Be Validated

[Kansas](#)
[Kentucky](#)
[Oklahoma](#)
[Tennessee](#)

Other Maps

Georgia

Information for States Without A Map.

Select a State



Changing policy to enable opportunity

Southeast market barriers require policy change

Greatest barrier to clean energy market development is current utility regulation, not resource availability

- Regulatory incentive is to maximize electricity sales, not efficiency

Initial policy actions to make economic opportunity possible

- Policy to conduct efficiency, renewable resource evaluation
- Policy to analyze different rate structures ability to achieve energy efficiency potential, and at what costs to ratepayers
- Policy to enable use of renewables –
 - interconnection, net metering, clear ownership rights to “green tags”
- Policy to support use of renewables, efficiency –
 - RPS, tax credits, rebates, loan programs, rate structure reform



Where does Southeast go from here?

Two paths

Cost paths are similar, so how will your state maximize increase in Gross State Product?

A) Sharp transition with repeated rate shocks

- Average US utility increasing rates 29%
- Wait for prices, utilities to enable market solutions

B) Smoother transition, economic benefits, smaller rate surprises/predictable, resilient

- Commit to step-wise diversification of energy supply
- Roadmap for energy technology integration and adaptation
- Clean energy workforce development



Ivan Urlaub

Executive Director

NC Sustainable Energy Association

P.O. Box 6465, Raleigh, NC 27628

Commissioner, Legislative Commission on Global Climate Change
Advisor, NC Climate Action Plan Advisory Group

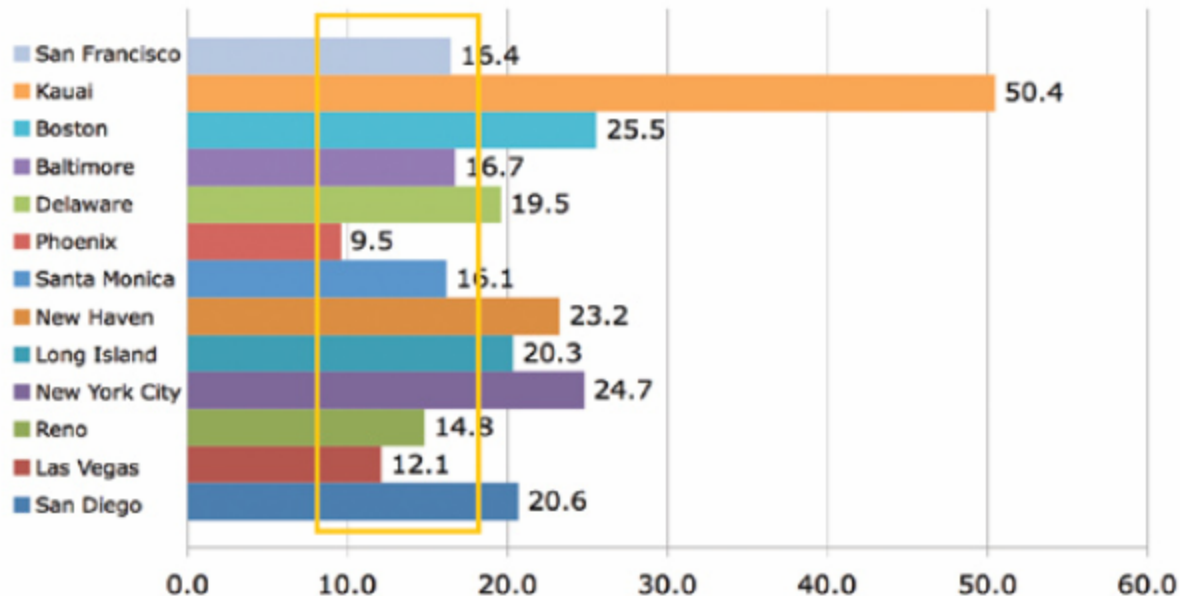
(919) 832-7601 (office)

ivan@energync.org

www.energync.org

Solar PV: Gaining a Competitive Price Advantage

Comparing U.S. Average U.S. Retail Electricity Rates with PV, 2015 (Cents/kWh)



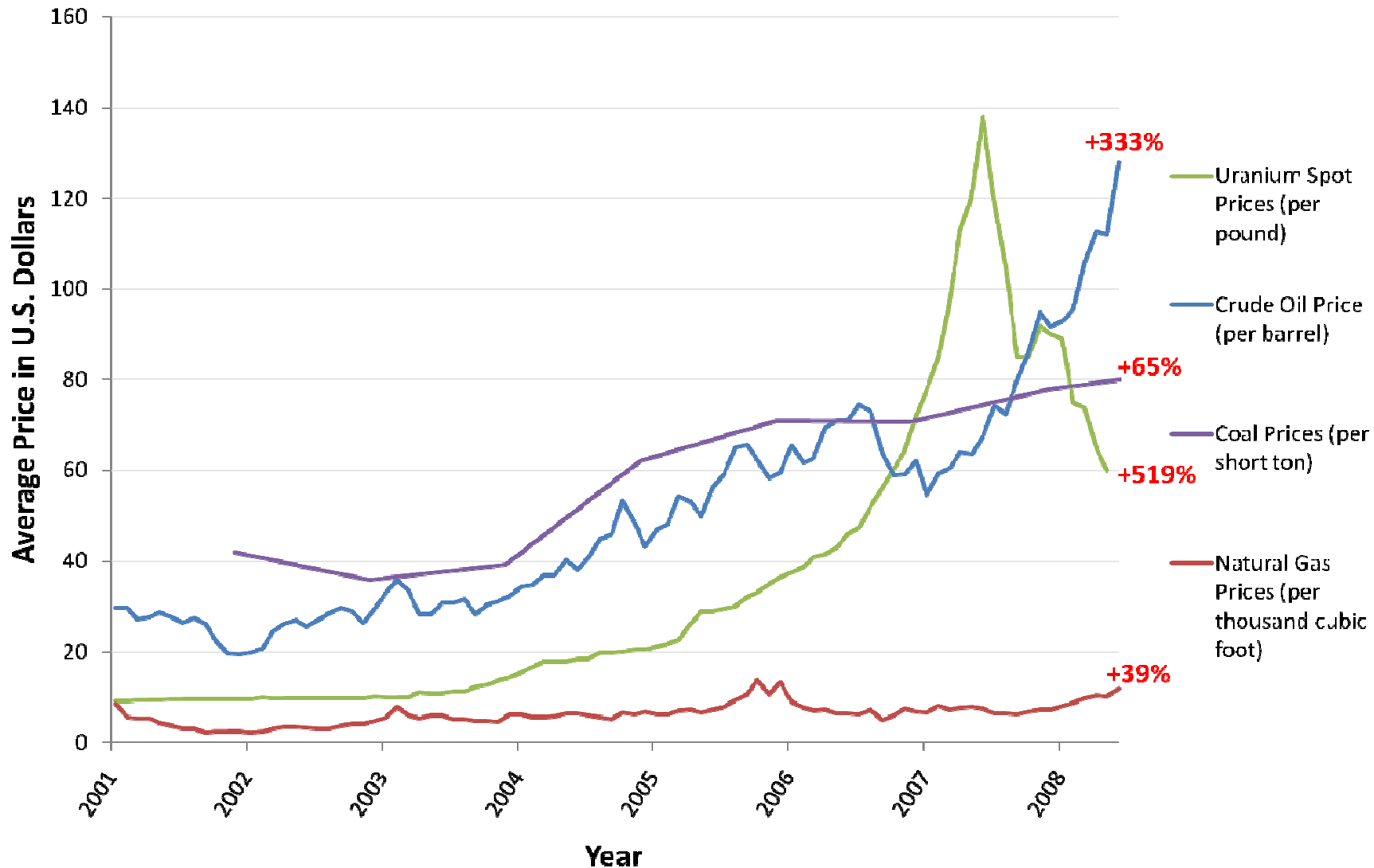
The above table shows projected cost for retail electricity in select U.S. cities in 2015 compared with the high and low cost range for installing solar PV. By 2015 Clean Edge projects that solar will be increasingly price competitive with retail electricity rates. Source: Clean Edge, 2008

- Solar PV estimated costs range from 8-14 cents per kWh
- Solar could become price competitive, should conventional electricity rates rise and PV prices decline faster than expected



Drivers of New Energy Economy

Annual Average Market Fuel Costs, 2001-2008

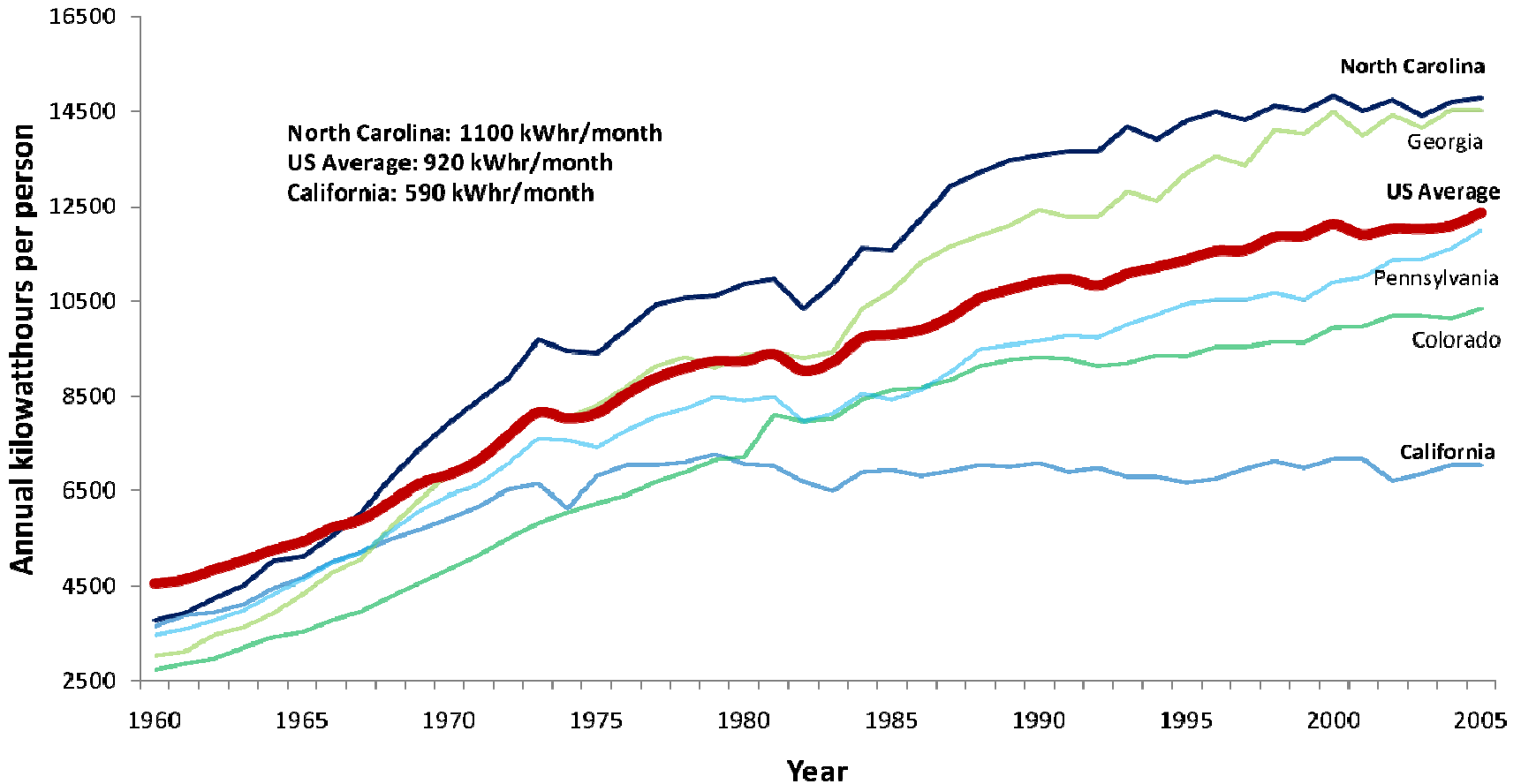




Drivers of New Energy Economy

Wasteful Energy Use, Wasteful Buildings

**Electricity Consumption per Capita
(1960 - 2005)**

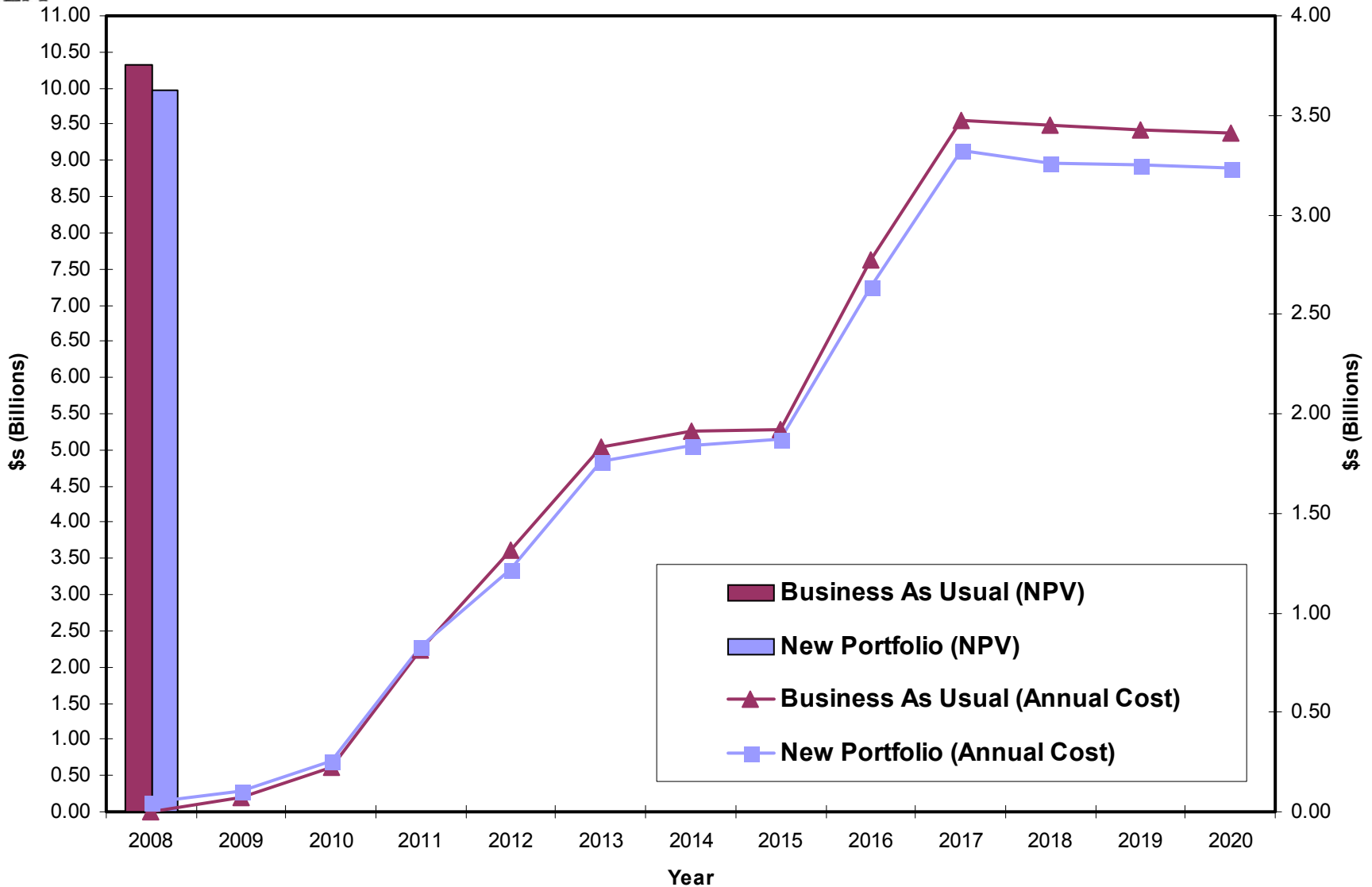




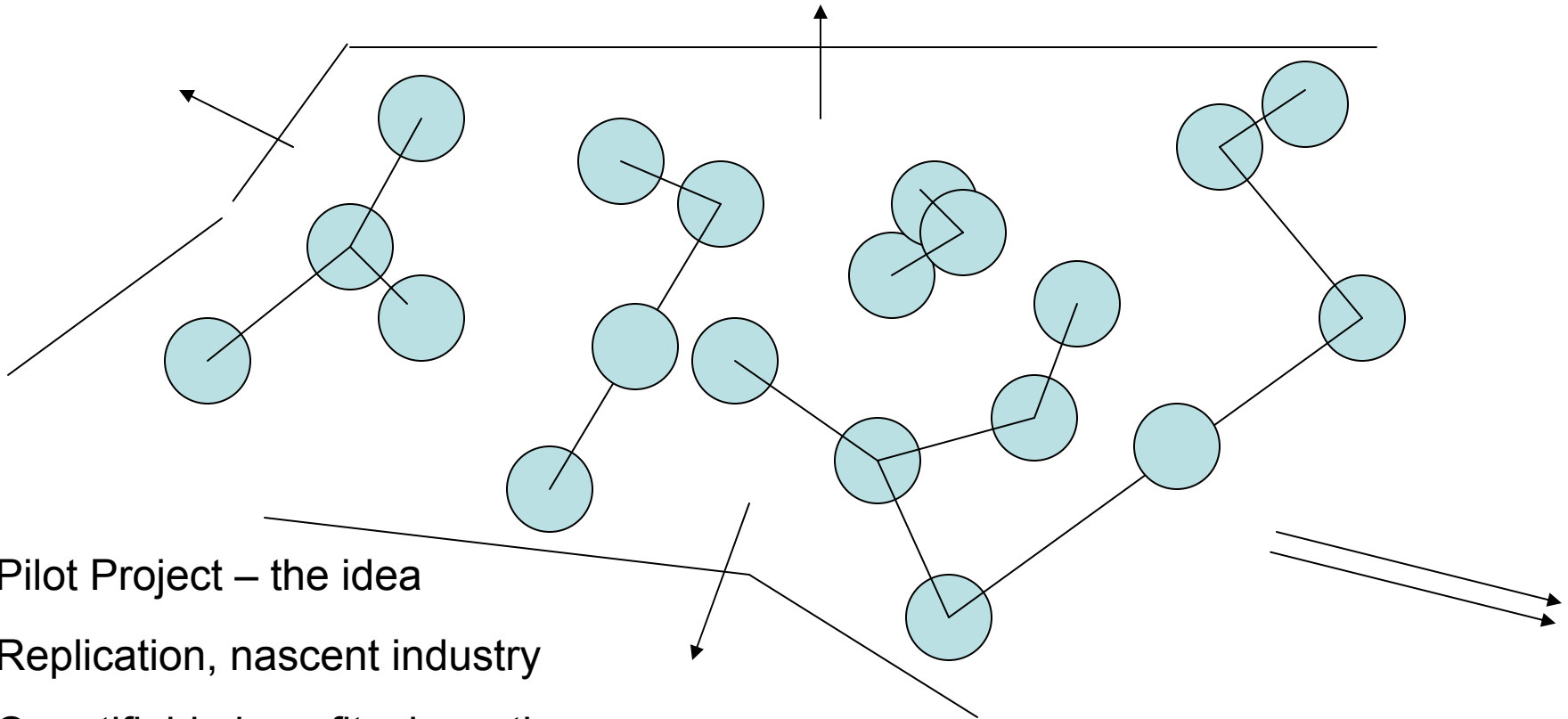
NCSEA

NC "La Capra" Cost Comparison

BAU to 10% REPS Utility Portfolio



Realizing Sustainable Energy – small to large scale



- Pilot Project – the idea
- Replication, nascent industry
- Quantifiable benefits, incentives
- Growth, interconnectivity
- Robust industry, export markets



Regulatory Issues of Interest

Small Renewable Generators

- Interconnection
- Green power pricing program (various)
- Access: ordinances, codes, etc (FL, GA, KY, NC)
- Renewable Portfolio Standard (NC, FL-JEA)
- Net Metering (AR, FL, GA, KY, LA, NC)
- Tax credits and/or industry support (NC, GA)
- Public Benefits Fund (none)



Questions for State Legislatures

1. How will your current state policies and regulations enable your energy market to find opportunity in the new global energy economy?
2. Do you need to revise your energy policy to realize benefits of the new energy economy?
3. Do you have a long-term energy plan?
4. Is it legislated? In the form of a report?