

NC Legislative Commission

- Review Climate Science
- Assess Risks to NC
- Recommend State GHG Goal
- Review Mitigation Options
 - Benefits
 - Costs

Science

- IPCC, NAS, Other Academics
- Science leaves no doubt that climate change is real, is happening now, requires action to mitigate worst risks
- LCGCC received mitigation recommendations from DENR Climate Action Plan Advisory Group

DENR CAPAG: www.ncclimatechange.com

- Originally comprised of 43 Stakeholders (Domain Experts)
- Divided into five Technical Working Groups (TWGs)
- Made 56 distinct recommendations to LCGCC

Potential Impact of Full Adoption

- Reduce gross GHG Emissions by 47% from 256 MMTCO₂e to 137 MMTCO₂e.
- Cumulative GHG reductions between 2007-2020 estimated at 838 MMTCO₂e

Key Opportunities:

- Energy Supply
 - Renewable Energy Incentives
 - REPS
 - CO₂ Tax or Cap & Trade
 - Public Benefits Charge

Key Opportunities:

- Residential, Commercial, Industrial
 - Demand Side Management Programs
 - Expand Energy Efficiency Funds
 - EE Requirements for Government Buildings
 - Green Power Purchasing

Key Opportunities:

– Transportation & Land Use

- Land Development Planning
- Green Building Incentives
- Truck Stop Electrification

Key Opportunities:

- Agriculture, Forestry, Waste Management
 - Manure Digestors, Energy Utilization
 - Biodiesel Production
 - Soil Carbon Management
 - Landfill Methane
 - Greater Recycling Infrastructure

Key Opportunities:

- Cross-Cutting Measures
 - Public Education & Outreach
 - Adaptation
 - GHG Inventory
 - Registry
 - Reporting

Economic Analysis -- Implementation

- Considering both costs and benefits, analysis indicates significant cost savings for both the state and local economy.
- Cost of inaction could be 5X or greater.

**CAPCA 2008: Renewables &
Green Building to Reduce
GHG Emissions**



Greenbridge

www.greenbridgedevelopments.com

Benefits of Renewables



- Wind and Solar Emit No Air Pollution
 - No greenhouse gases
 - No public health threats from pollution, particulates or nuclear waste/accidents
 - No air or water toxics, such as mercury
 - No strip mining or mountain top removal
- Locally available clean and abundant resource
- Significant local economic development benefits

Wind Opportunity



- 14000 MW installed in US
 - Powers 3.4 million average homes served
 - Equivalent to 0.5% of the total US energy mix

One 100MW Wind Farm



- Supplies the electricity needs of 40,000 homes.
- Displaces 157,200 tons of CO₂, 920 tons of SO₂, and 570 tons of NO_x per year.
- Provides \$5 million in payments to farm landowners, and \$12.5 million in wages over its 25-year lifetime.

Cost of Wind Energy Trend

1980: 40 cents/kWh

**2000:
5 - 6 cents/kWh**



NSP 107 MW Lake Benton wind farm
4 cents/kWh (unsubsidized)

**2007:
4 – 4.5 cents/kWh**

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Wind Revenues



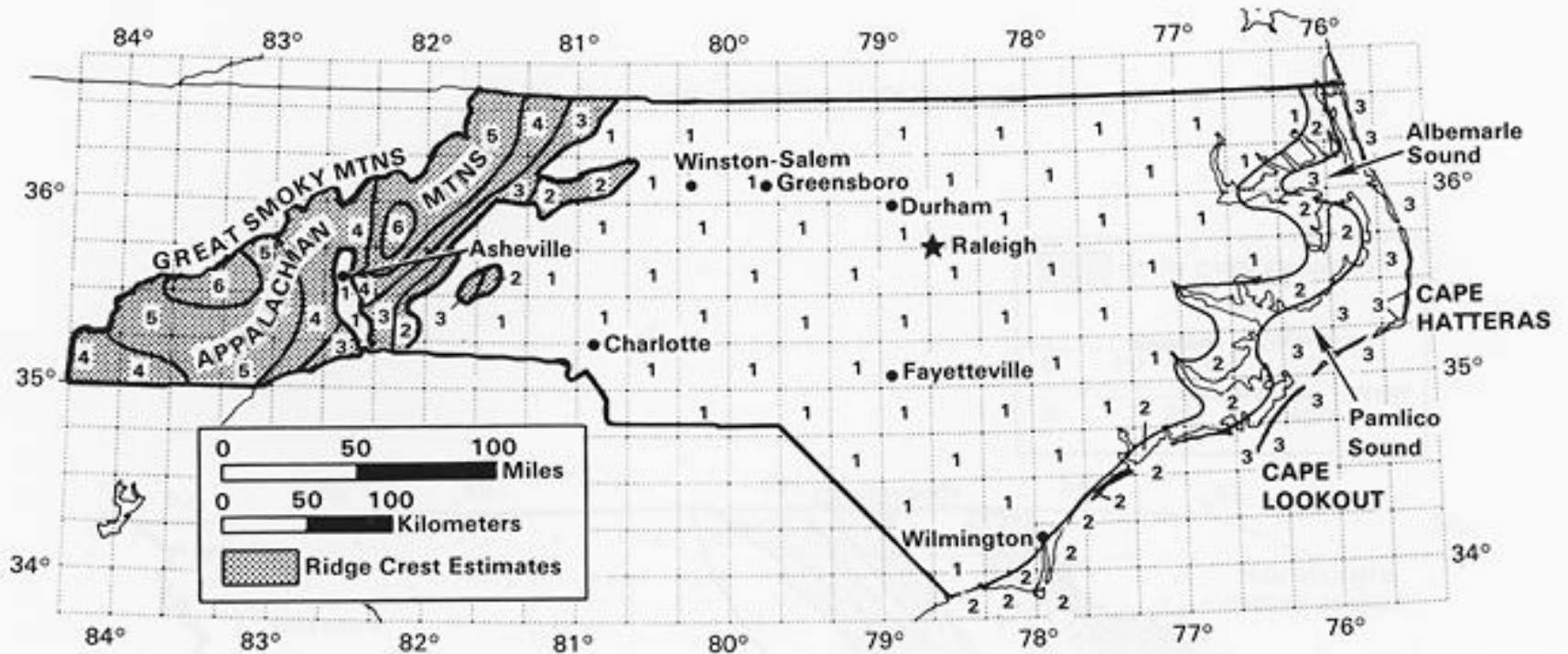
- The magic number $\cong 2.8\text{¢}$
- The avoided cost of generation for NC utilities and the price the utility would likely pay for wind
- Add in Federal Production Tax Credit $1.7\text{¢} = 4.5\text{¢}$
- Can renewable energy match this price?

Mountain vs Coastal Wind



- NC mountains have some of the windiest sites in the Eastern US. Many class 5, 6 and even 7 sites.
- Current cost of wind in NC mountains could be as low as 4¢ per kwh.
- NC coast has wind resources of class 3 and higher. Opportunities offshore. Current cost is about 6¢ per kwh.
- Could build-out 2500MW in NC by 2018.

Locating Wind Farms



Policy Issues



- Renewable & Efficiency Portfolio Standard: NC 2007 Senate Bill 3
- Public Benefits Fund
- Federal Production Tax Credit
- Ridge Law
- Creation of greenhouse gas trading markets to offset some cost of renewable generation

Benefits and Economics of Renewable Energy



- Less dependence on foreign and fossil fuels
- Steady new source of income to farmers
- Public Health Benefits
- Increase in property taxes to rural counties



Greenbridge

Project Summary



216,540 S.F. High-density
Mixed-use building on
54,724 S.F. Lot

- 99 Residential units including 15 on-site subsidized residences
- 35,000 S.F. Retail/Office Space
- 5,100 S.F. Plaza
- 216 Underground Parking Spaces
- 128 Bike Spaces w/ Showers
- Cutting-edge Green Technology
- LEED Gold Certification*
- Minimum 20% Energy Efficiency

*Pending USGBC approval

Greenbridge Benefits



- Buildings consume 65% of all electricity
- Green building efficiency can save 50%
- Reduces Pressure on Rural Buffer
- Creates Jobs
- Contributes \$1MM Tax Revenue/yr
- Requires No Public Financing
- Reduces Carbon Footprint

Suburban Sprawl v. Urban Density



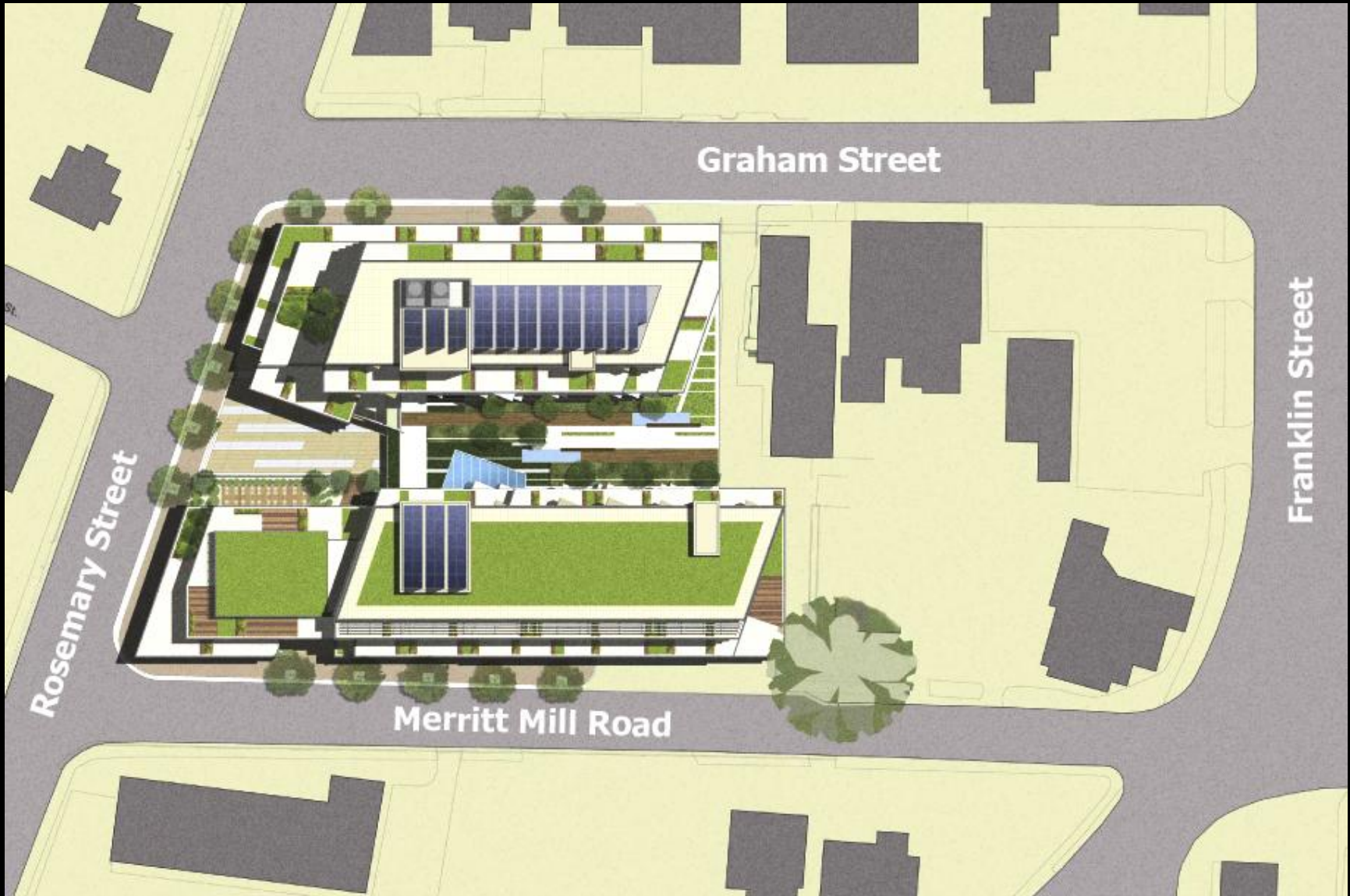
	Suburban	Urban (Lg)	Urban (Sm)
Households (HH) per Acre	3	100	100
Acres per 1000 HH	333	10	10
Water: Gals per HH/Day	1,032	192	192
Vehicles per HH	2.2	0.48	1.2
VMT per HH/Year	23,552	4,011	12,788
Gas: Gal/HH/Year	1,570	267	852
Pounds Nitrogen oxide	207	35	112
Pounds Particulates	274	91	182
Tons Greenhouse Gas	22.0	3.7	11.9

Source: www.sierraclub.org/sprawl/density

Rendering from Rosemary St



Aerial View Rendering



Greenbridge Mechanical Detail



Greenbridge Mechanical Detail



Cooling Tower

Solar Panels

Exhaust Fans

Stairwell

Elevator Shaft

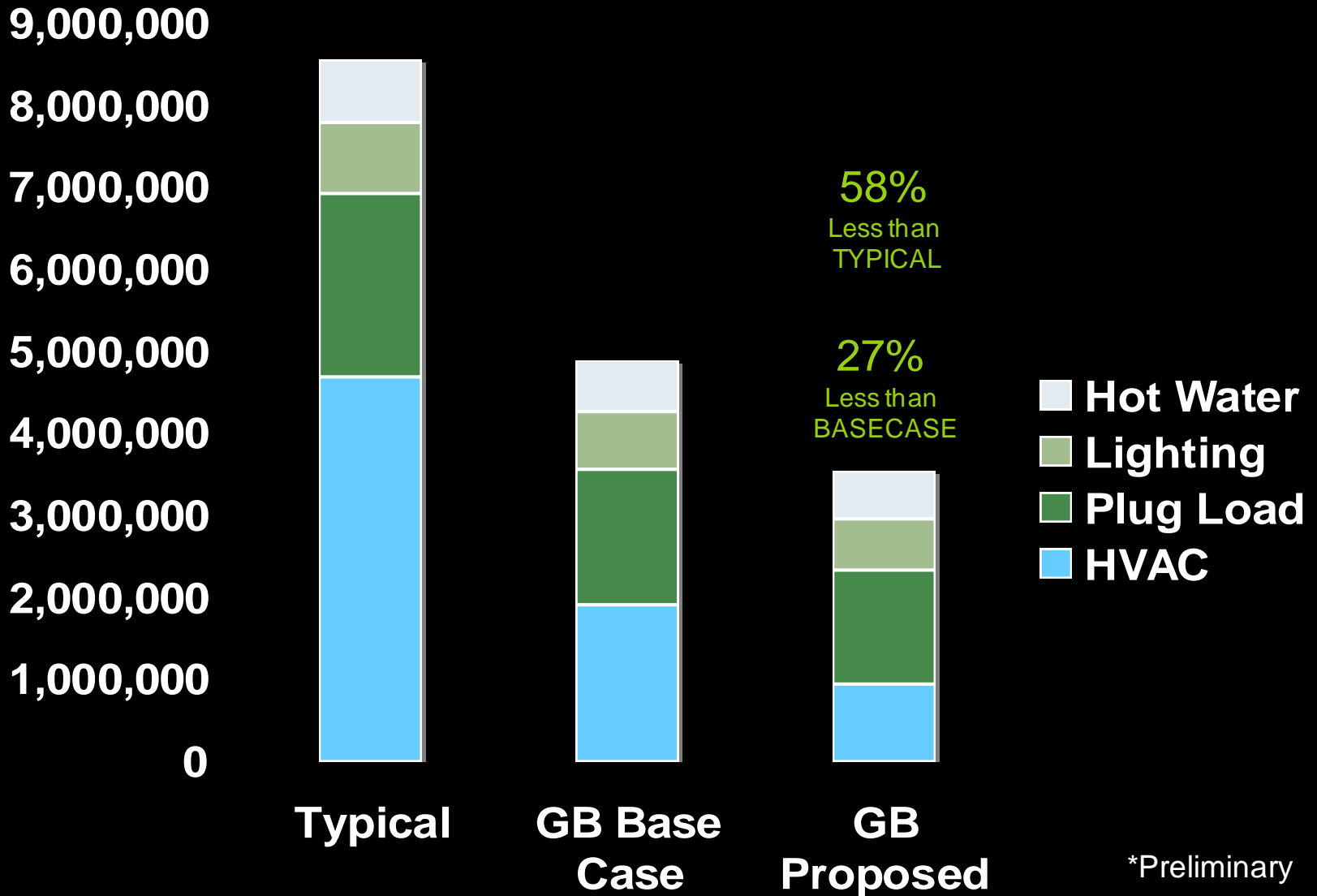
Green Screens

Green Attribute Commitments



- Green Roofs
- Solar Thermal / Photovoltaics
- Green Materials
- Low Energy Lighting/controls
- Energy Star Appliances
- Low E Glass
- Natural Day lighting
- Construction Waste Recycling
- Underground Parking
- Covered Bicycle Storage/Showers
- Water Conserving Fixtures
- Building Commissioning
- Integrated Green Design

Energy Model* (kwh/yr)



*Preliminary

– Senator Ellie Kinnard



“I understand there is concern over the changing streetscape of Chapel Hill as proposed by Greenbridge. As a newcomer in 1964, I was amazed to see the unified colonial style of commercial buildings. I was amused to see colonial gas stations, bus stations, and grocery stores in the 20th century. Eventually the style became the semi-official vocabulary of the town. **But just as historic, is the expression of each generation's aspirations reflected in their architecture. We are fortunate to have an expression today that reflects our great love for and stewardship of our environment. Our goal of preservation now is our planet's preservation. What could better epitomize this than a completely green building, and one of magnificent architectural design? Greenbridge is a rare opportunity to show the world we are serious about our leadership in carbon reduction through building and living our ideals.**”



Greenbridge

Event Center



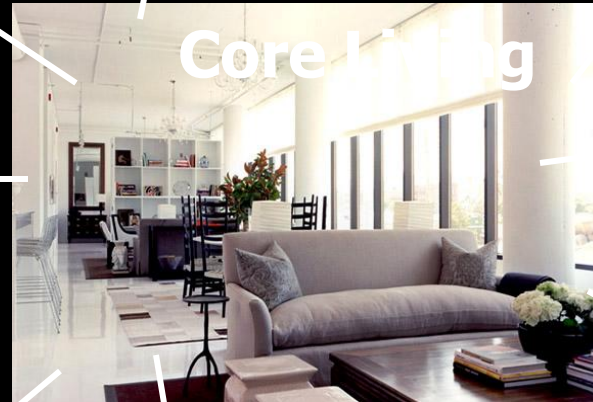
Courtyard



Private Fitness Center
Greenberg



Franklin Street



Core Living



Theatre



Market/Restaurants

Kitchen, Living Room, Dining Room,
Bathroom(s), Bedroom(s), Computer Room



**24 Hour
Concierge/Security**



Community Garden