

Introduction

- First complete inventory of greenhouse gas emissions in the Town of Blacksburg
- Includes Virginia Tech and Town of Blacksburg's municipal operations
- Research conducted by VT students under direction of Professor John Randolph
 - Spring, 2007: UAP 4394 – Community Renewable Energy Systems
 - Fall, 2007: UAP 4354/5794 – Environmental Planning Studio

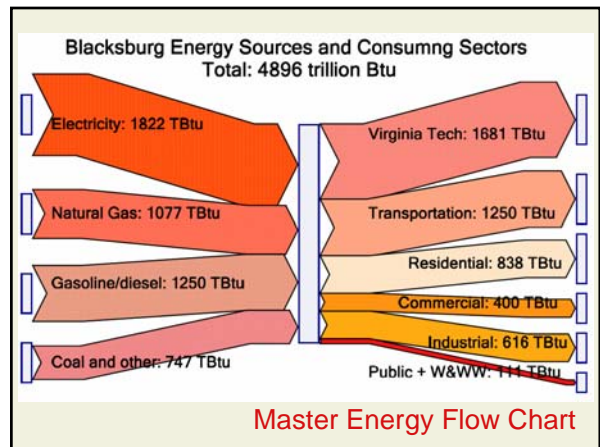
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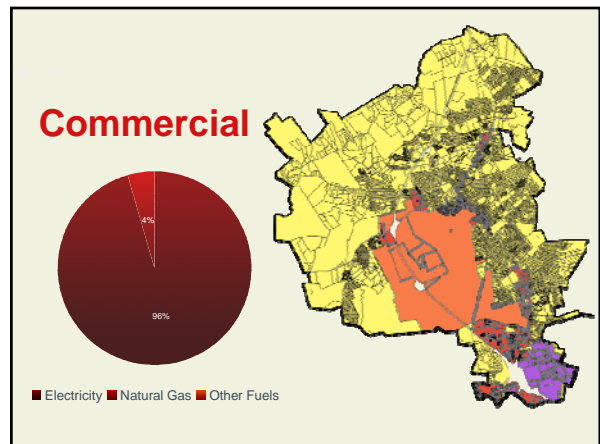
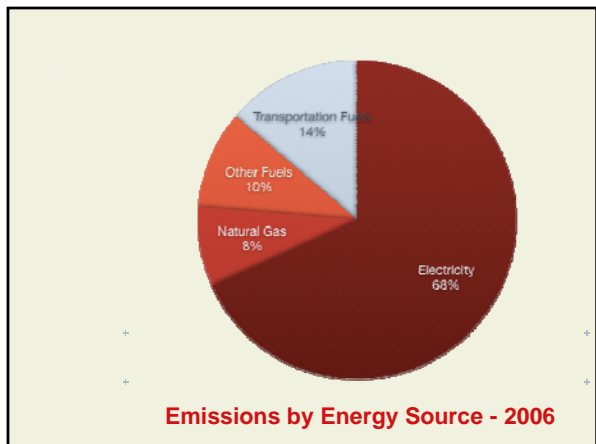
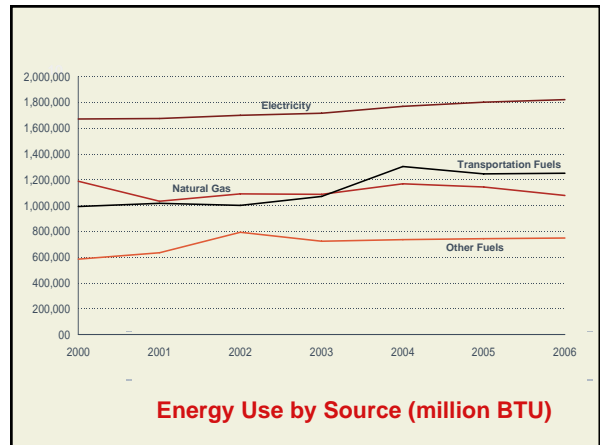
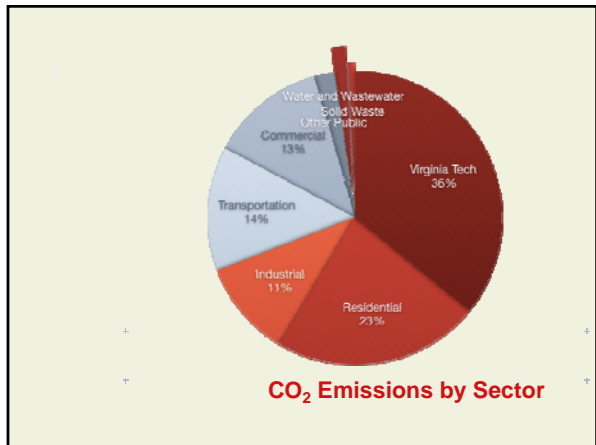
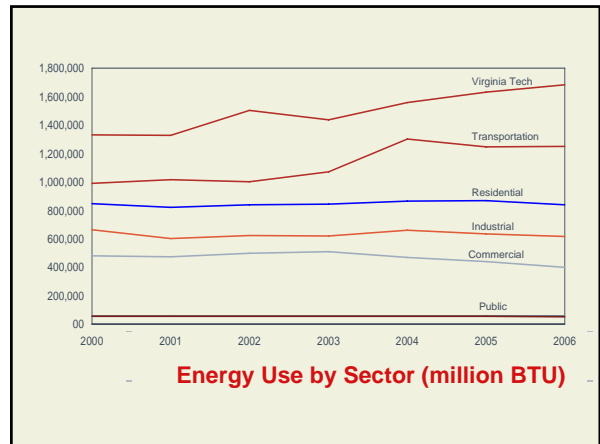
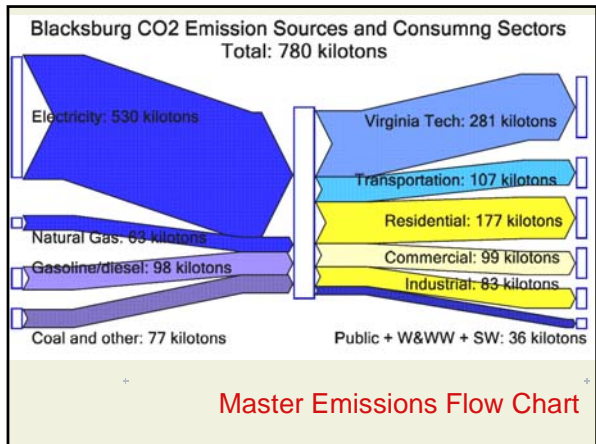
- Blacksburg is part of growing movement to mitigate climate change through local government planning
- Cool Cities (over 750 members) and ICLEI Cities for Climate Protection (over 300 in U.S.)
- Mayor Ron Rordam signed US Mayors' Climate Protection Agreement in November, 2006
- Pledge to inventory current GHG emissions, project future emissions, and plan to reduce future emissions to 7% below 1990 levels

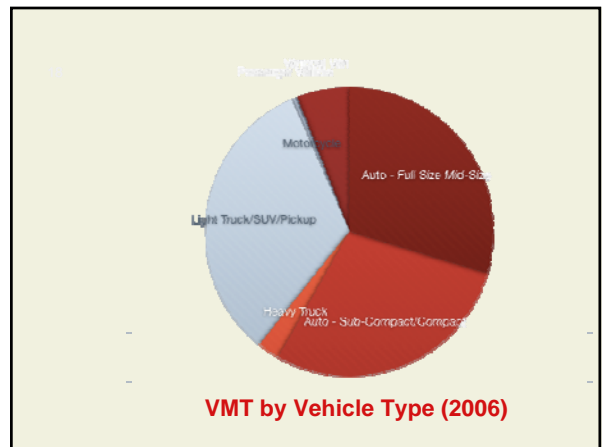
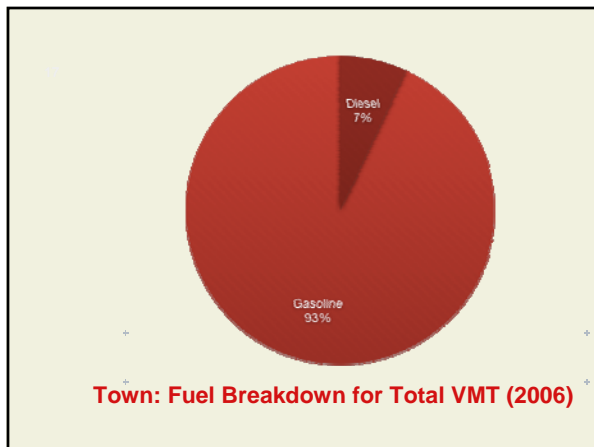
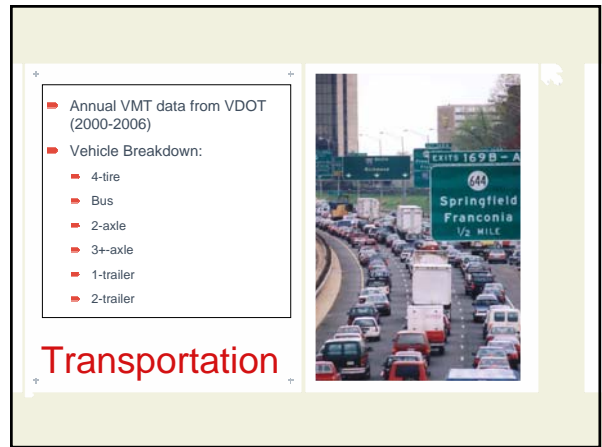
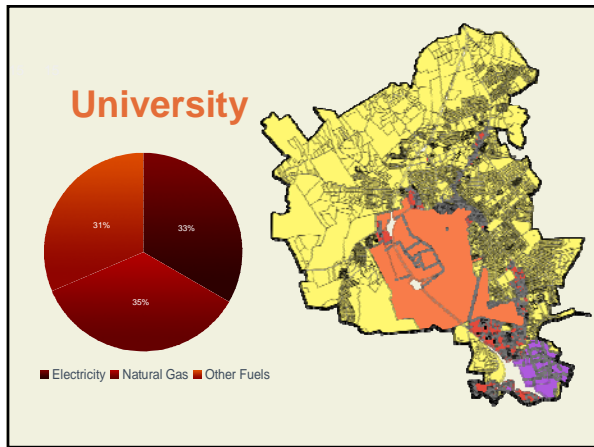
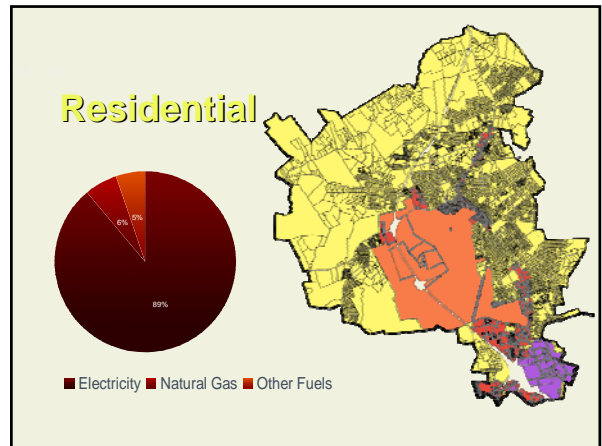
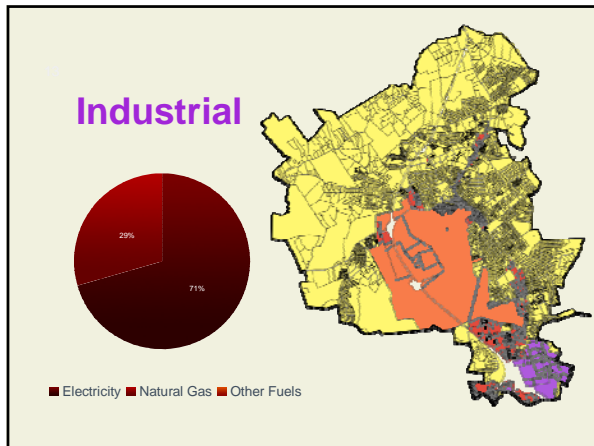
- Gathered energy use data from local utilities, state agencies, Town, and University for years 2000-2006
- Data for some years based on estimates, projections
- Converted data to British Thermal Units and CO₂-equivalent GHG emissions
- Used GHG inventorying software provided by the International Council on Local Environmental Initiatives (ICLEI)

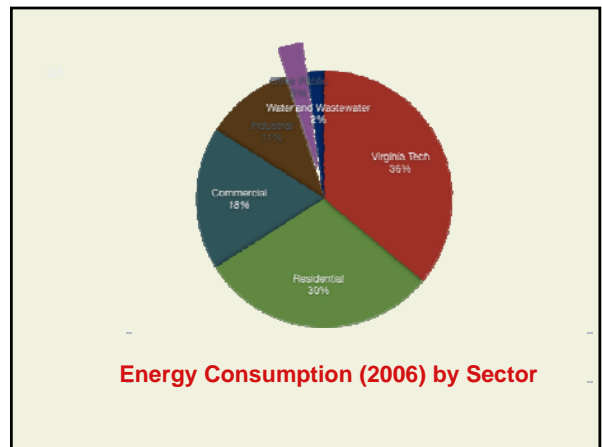
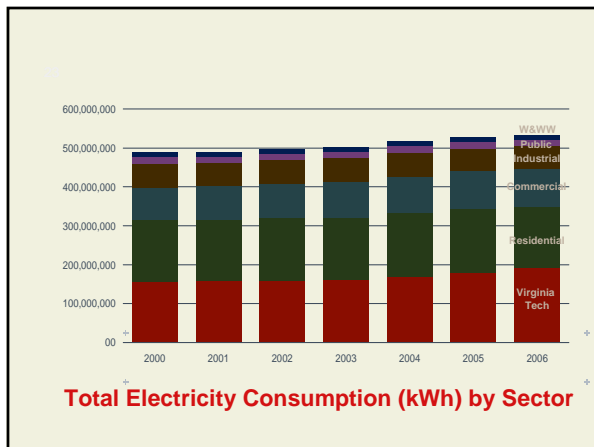
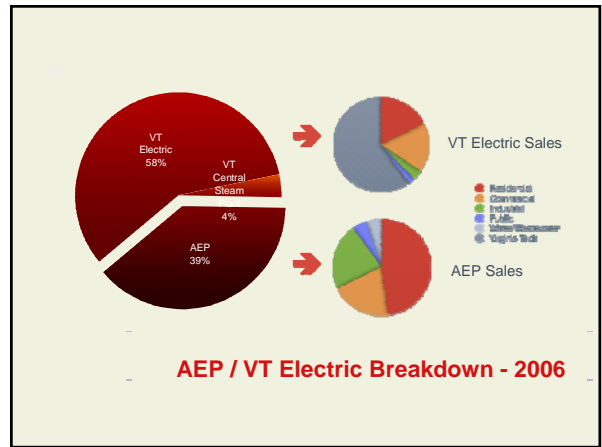
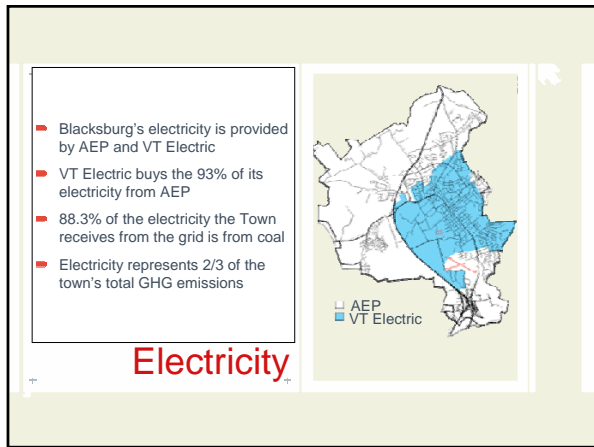
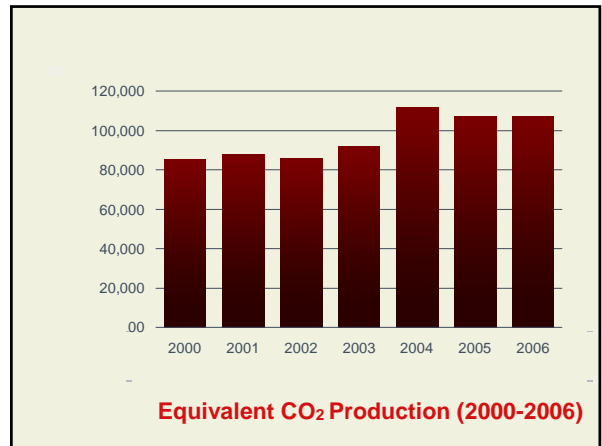
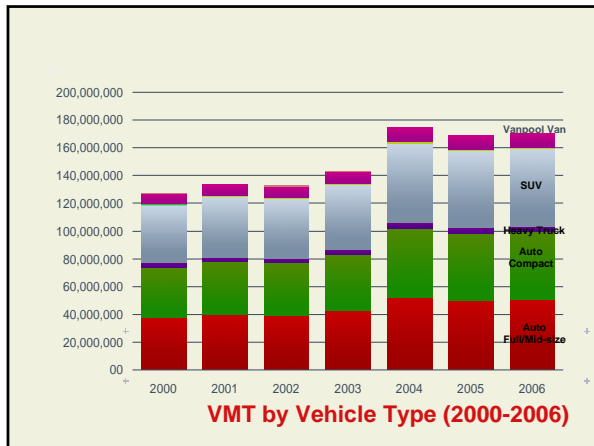
Organization of the Report

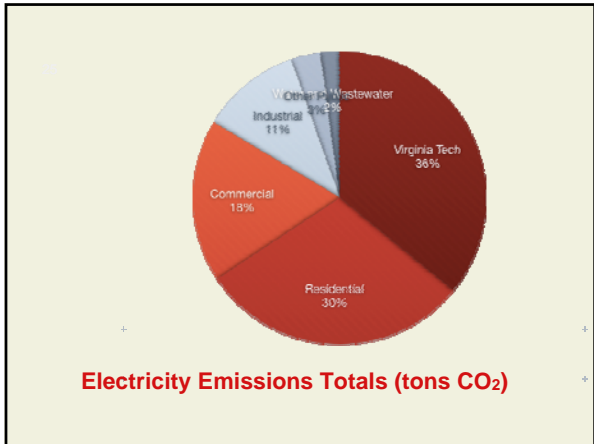
- Overview of Energy Use and Emissions
 - Totals by Sector: Residential, Commercial, etc.
- Electricity and Natural Gas
- Transportation
- Water and Wastewater
- Solid Waste
- Virginia Tech
- Town Operations
- Conclusions and Next Steps





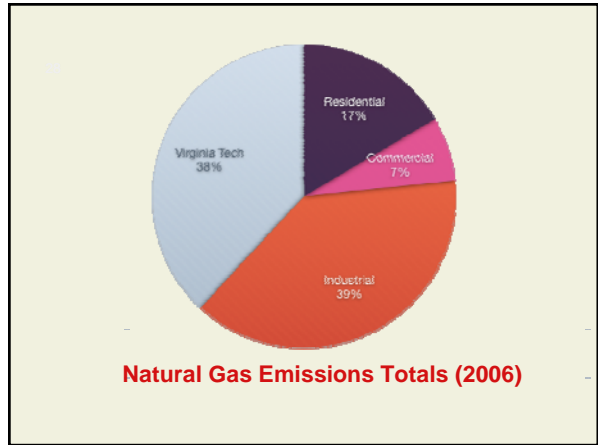
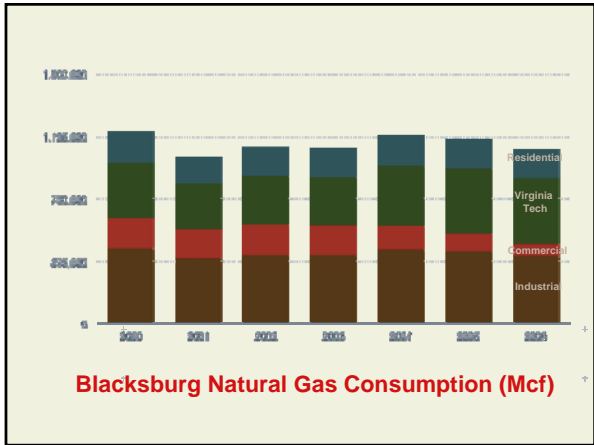






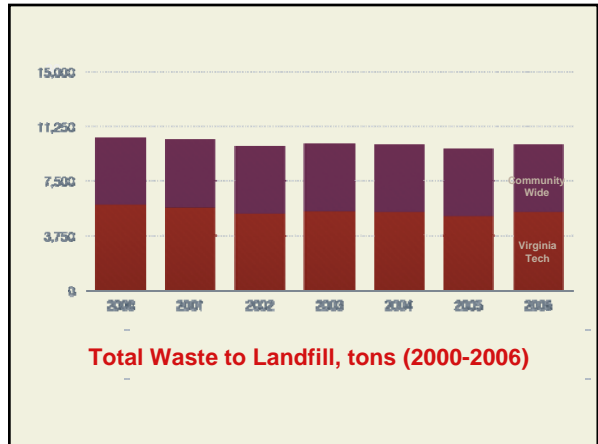
- The Town's natural gas is provided by Atmos Energy
- Atmos provided combined data for Blacksburg and Christiansburg for the years 2000-2006
- Sector-specific totals for Blacksburg were provided for 2005-2006
- Natural gas represents 9% of Blacksburg's total GHG emissions

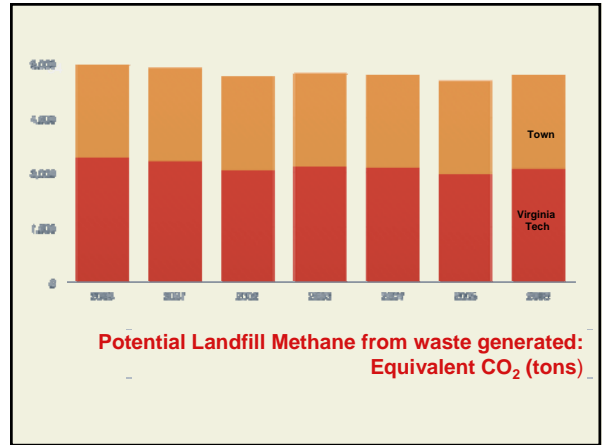
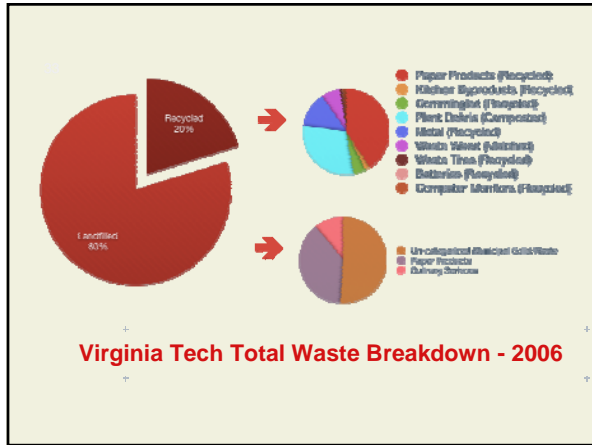
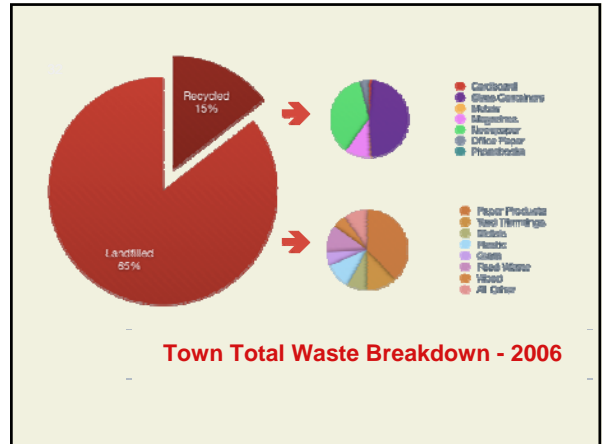
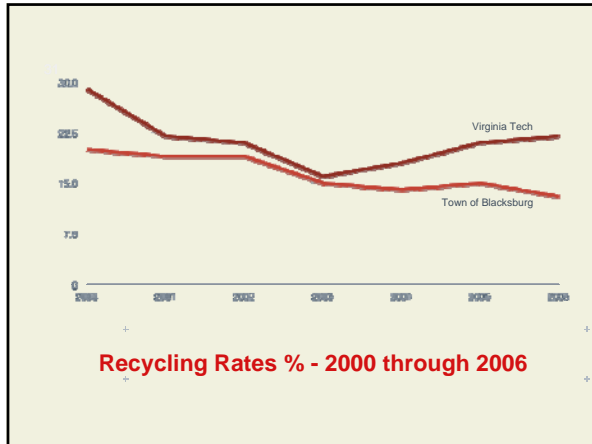
Natural Gas



- Landfilled biodegradable materials contribute to methane emissions
- Methane as a greenhouse gas is ~20x as powerful than CO₂
- National averages were employed to determine Town and University waste and recycling breakdowns

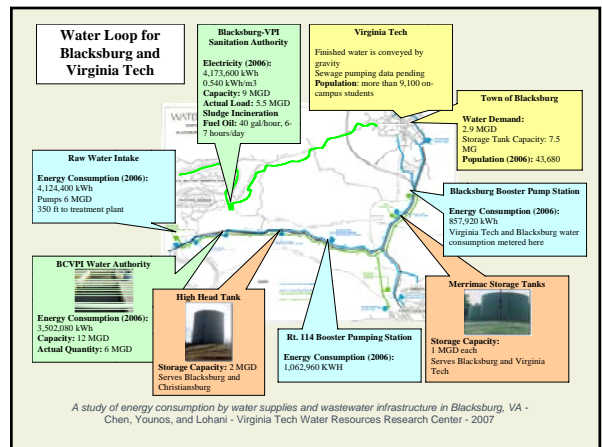
Waste

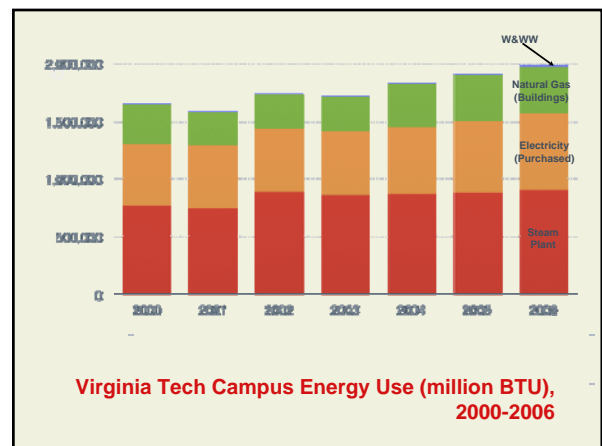
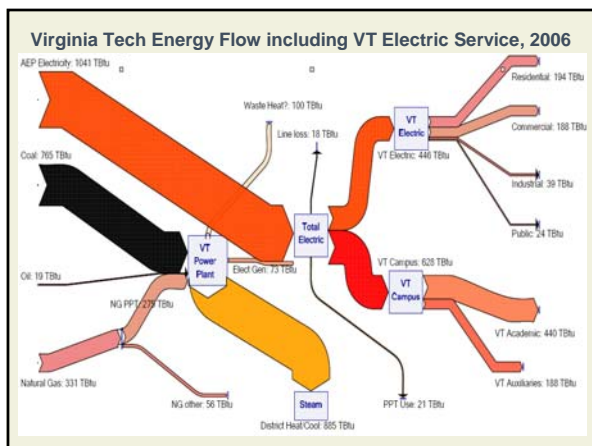
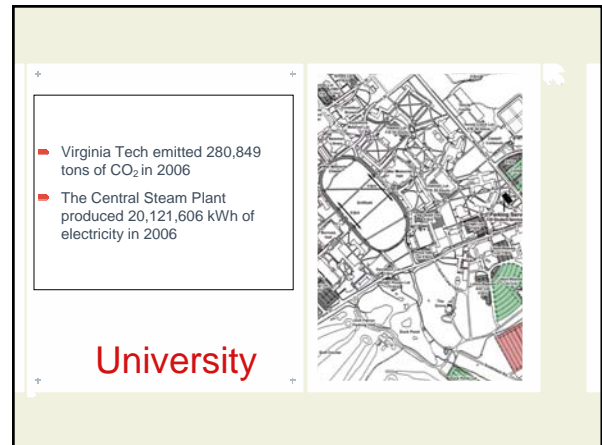
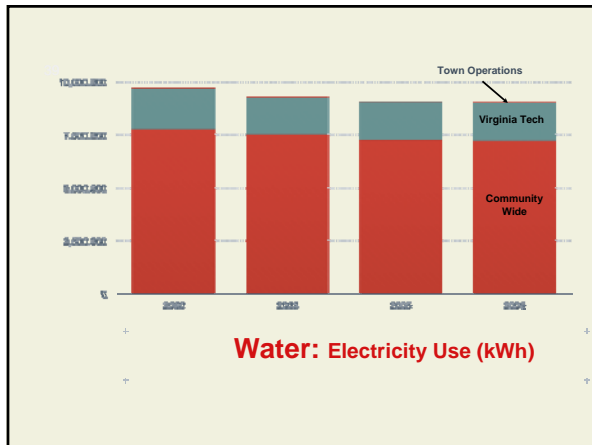
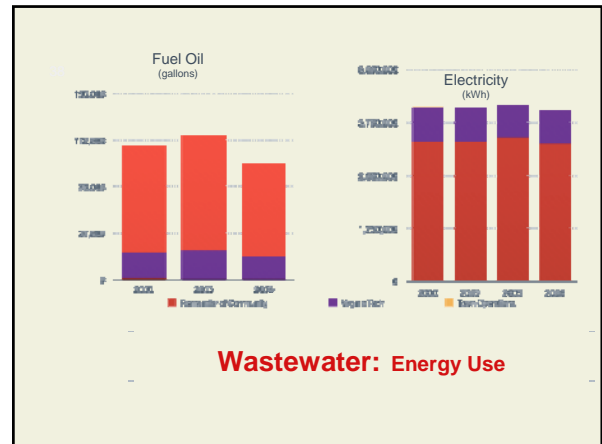
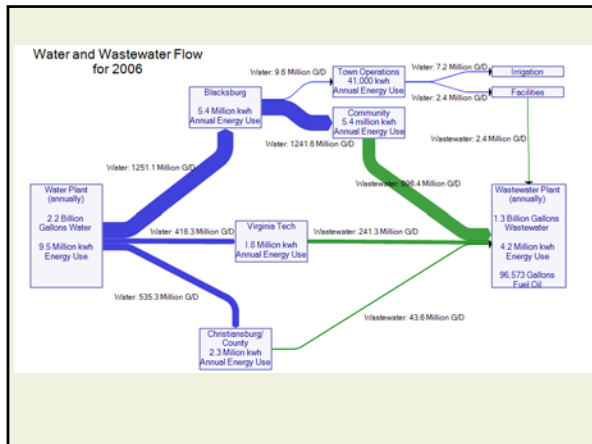


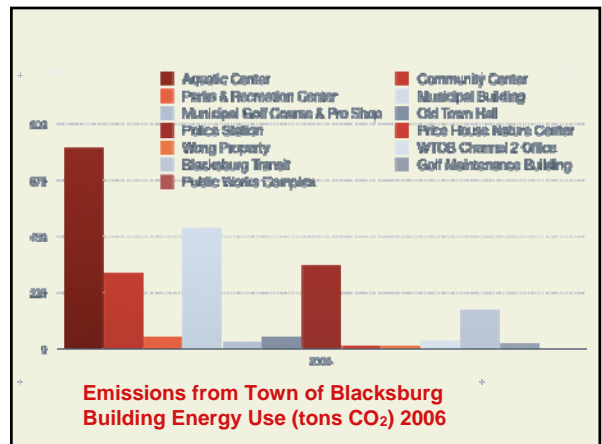
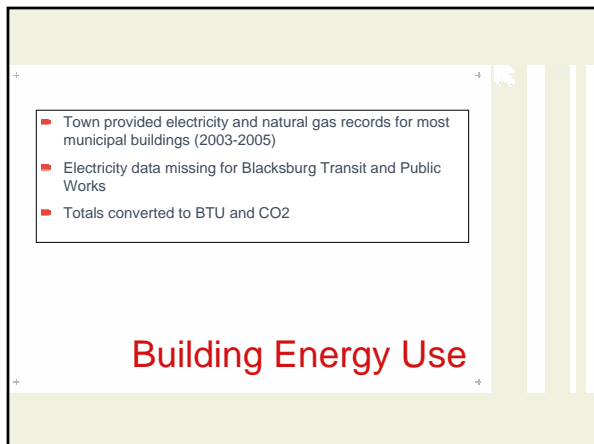
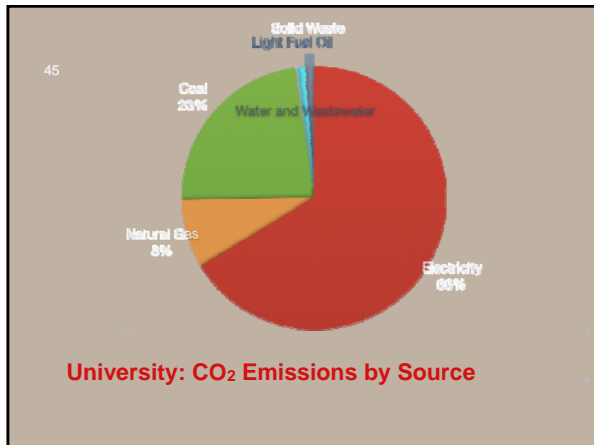
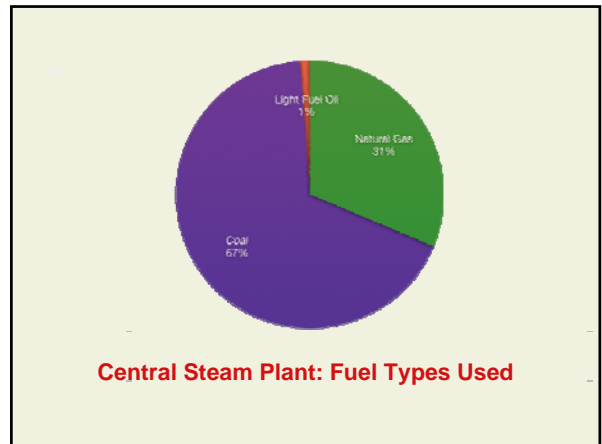
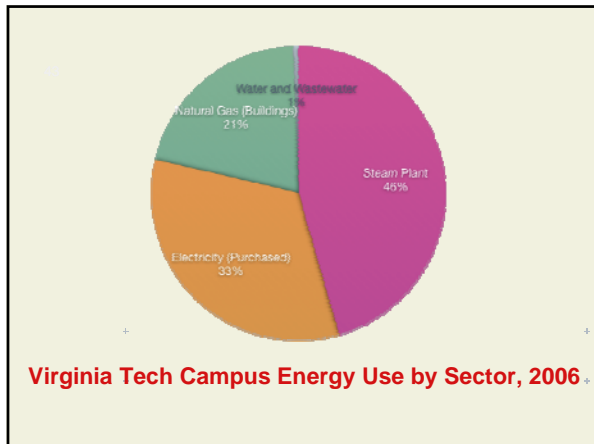


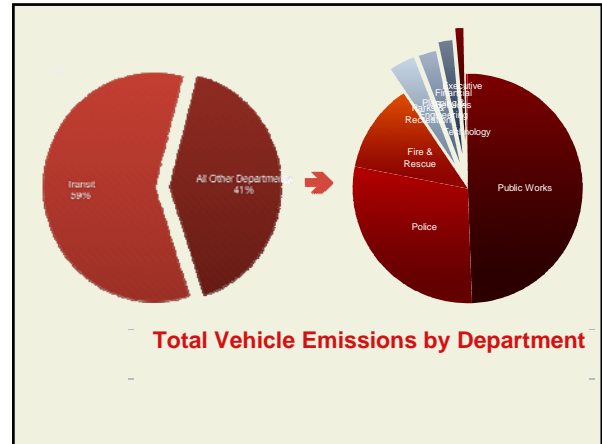
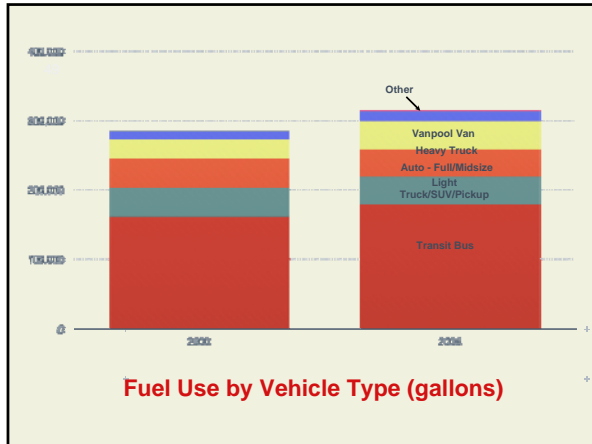
Water +

- Blacksburg Community Water and Wastewater Energy Use
- The water filtration process gives off no direct emissions
- The wastewater treatment plant emits small amounts of air pollutants during the fuel oil consumption that is used during sludge burning.

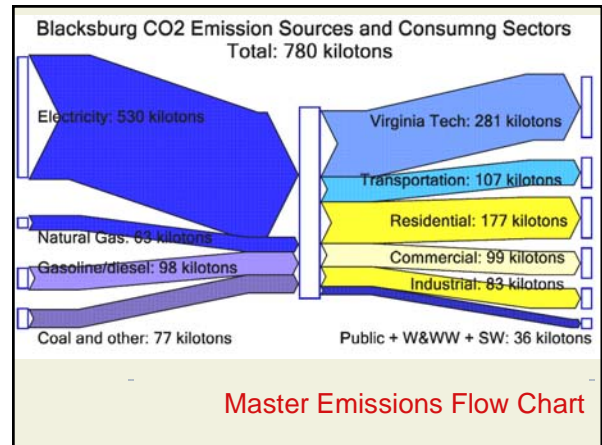








- Other Emissions from Town Operations**
- Streetlights
 - Town owns @ 1500 streetlights. Electricity provided by AEP and Tech Electric (67% of lights are Tech Electric)
 - Approx. 1,322,000 kWh and 1,300 tons CO2 per year
 - Water and wastewater treatment
 - Around 200 million BTU and 50 tons CO2 per year
 - Waste from Town facilities
 - Average of 420 tons of waste in 2005-2006, @ 1/3 recycled. Landfill waste generates around 175 tons CO2-equiv per year



- We are on the Right Track!**
- Community-Wide and Town Operations GHG Emissions Inventories are nearly complete
 - Very few U.S. communities have come this far: only @ 20 completed inventories as of early 2007
 - Other Virginia jurisdictions are working on climate plans
 - Arlington County, Albemarle County, Charlottesville, Harrisonburg, Roanoke, Roanoke County, Winchester

- Remaining Inventory Tasks**
- Obtain remaining town operations data: building energy use, streetlights, waste/recycling
 - Estimate employee commute energy use for Town of Blacksburg
 - Include transportation energy use data for Virginia Tech
 - Refine natural gas estimates

- Project emissions back to 1990 and forward to 2020
- Determine an emission reduction target
 - 7% below 1990 levels by 2012?
- Create a plan for reducing emissions to achieve the target
 - Identify barriers to achieving targets
 - Analyze options for emissions reduction and cost-effectiveness
 - Select action projects, schedule, and financial plan

Next Steps

- Professor John Randolph
- Presenters: Damian Pitt, Dave Prichard, Chinmay Dhamne, Angella De Soto, Mandy Bernard, Thomas Burke
- Fall, 2007 Research Team shown on adjacent table

Town Operations	Campus and Community
Buildings	Res/Comm/Ind
Devinne Aaron	Chinmay Dhamne
Jay Berenzweig	Whitney Marley
Vehicle Fleet	John Goldish
Thomas Burke	Ryan Johnson
Amanda Micklow	Asa Spiller
Streetslights	Transportation
Valerie Cowden	Shrusi Rathore
Waste/Recycling	Mary Ashburn Darby
Jordan Mitchell	Dave Prichard
Water/Wastewater	Jen Kivlin
Sarah Davis	Alison Mitchell
	Waste/Recycling
	Angie DeSoto
	Water/Wastewater/Other
	Erika Adams
	Mandy Bernard
	Agriculture Operations
	Carrie Hileman

Town Operations		Residential, Commercial, Industrial	
Name	Research Area	Name	Research Area
Lauren Cogen-Cheaney	Town fleet and buses	Garrett Bradley	Electricity
Gregory Glenn	Town fleet and buses	Alison Mitchell	Natural gas
Nikolas Macko	Town fleet and buses	Kalin Camrady	Other heating fuels
Todd Brower	Electricity and gas	Kongkun Charoensitvat	Other heating fuels
Gregory Franklin	Electricity and gas	Juliana Portnoy	Other heating fuels
Shun Chonabayashi	Water/wastewater	Virginia Tech	
Megan Story	Water/wastewater	Name	Research Area
Sherril Cook	Waste/recycling	Angella De Soto	Electricity and gas
Corianne Tatarw	Waste/recycling	Chinmay Dhamne	Electricity and gas
Transportation		Gaurav Bansal	Fleet and parking
Name	Research Area	Eric Nielsen	Fleet and parking
Ryan Johnson	Bio-fuels	Thomas Mazuch	Power plant
Austin Phoenix	Census data	Eric Devine	Power plant
Daniel Metzger	Fuel distribution	Christina Lick	Steam system
Bill Long	Fuel distribution	Karishma Malu	Steam system
Eric Howard	Traffic counts	Rebecca Murray	Water/wastewater
Stephanie O'Connell	Traffic counts	Netanya Huska	Waste/recycling
Brian Freeman	Vehicle registration	Shane Kidler	Waste/recycling

Questions? Comments?

What do we need?

- Leadership
- Commitment
- Expertise
- Investment
- Early action and success:
 - VT initiatives
 - Town initiatives
 - Community initiatives

What should be our next steps?