SuffolkCounty
CitiesForClimateProtectionCampaign

GreenhouseGasEmissions&EnergyUsageInventory

With Recommendations for an Emissions Reduction Local Action Plan

Prepared by Kelly Mason
Suffolk County Department of Health Services, Division of Environmental Quality and
The International Council for Local Environmental Initiatives

Summer, 2001

Alternatives

Efficiency

Sustainable Lifestyles

If this is to be about economics and not global warming, *Fine!* *Let's talk about economics.*

Let's talk about the County's $25.7 *million* energy bill *in 2000*.

Energy efficiency will *save* ***money***. Initial investments for energy efficient technologies will *pay for themselves* many times over. And do Suffolk County residents ***really*** **worry about saving money,** anyway, while d*riving* SUV's (thus paying more for gas) and w*a*sting energy on *electric toothbrushes*?

"Suffolk County residents are the highest emitters of greenhouse gases accounting for 47% of Suffolk's total emissions. This percentage is alarmingly high and cause for concern. As well, per capita emissions in Suffolk County are relatively high when compared to other communities in the United States. The New York State per capita emissions average is 11.8 tons of eCO2 annually. Suffolk ranks in at 25 tons eCO2 per capita."

Newsday.com

(color and italics added for emphasis)
http://www.newsday.com/news/printedition/longisland/ny-liheat092291831aug09.story

LI Power Warning

Amid heat wave, LIPA urges all to cut electricity use

By Joie Tyrrell
STAFF WRITER

August 9, 2001

And the heat goes on.

For the third day in a row, temperatures sizzled across Nassau and Suffolk counties, setting the Long Island Power Authority on *critical alert* as the mercury hit a record-breaking 98.5 degrees.

LIPA officials - imploring customers to cut back on power use - are expecting more of the same today.

"We are in the middle of a heat storm. This is not just hot weather, this is a heat storm that is stressing the electric grid to its absolute maximum," said Richard Kessel, LIPA chairman. "There is no room for error, *and we absolutely need the public to forgo the use of [unessential] electricity until we get some relief."*

Yesterday's high climbed to its peak at 4 p.m. at Brookhaven National Lab in Upton, making it the hottest day of the year so far and eight degrees higher than the record for this date set in 1983, said lab meteorologist Victor Cassella. The heat index made it feel like up to 105 degrees in Islip, said Kevin Lipton, a meteorologist with the National Weather Service in Upton.

The soaring temperatures stretched resources islandwide. *With about 4,645 megawatts of power available yesterday, LIPA officials watched as demand grew to a staggering peak of 4,560 megawatts between 4 and 5 p.m., making yesterday the second highest use day since July 6, 1999, when record peak load for LIPA hit 4,590 megawatts.*

One megawatt is enough to power 1,000 homes. Early yesterday, LIPA declared a Stage One Power Alert, asking customers to immediately reduce their use of power. Stage One is the first of four levels of alerts, with the most serious being Stage Four when the utility could implement rolling blackouts. Kessel said that today, with highs again expected in the 90s, will be another challenge.

"We want all of our customers to know how critical this is that they avoid using any [unessential] electricity until this is over," Kessel said. "This means not doing laundry, not using the dishwasher, avoiding the electrical appliances in the house."

About *21,000 outages have been reported since Tuesday morning. But most were scattered* over the Island at staggered times and restored within a few hours. LIPA has enacted its peak load reduction program, requesting businesses to cut back on usage each day. That program saved about 80 to 85 megawatts yesterday.

Statewide, the New York Independent System Operator, which coordinates the state's energy grid and energy markets, set a peak-load record of 30,665 megawatts yesterday and declared an emergency when its operating reserves slipped below 1,800 megawatts, spokesman Steven Sullivan said.

Staff writers Denise M. Bonilla, Samuel Bruchey, Kelly Bowser and Tom McGinty contributed to this story. *Copyright © 2001*, Newsday, Inc.

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Greenhouse Gas Emissions and
Energy Usage Inventory

Cities for Climate Protection Campaign
Summer, 2001

Suffolk County, NY

• *Executive Summary* •

Introduction

Local governments have the power and potential to make critical policies that affect lives; they are closest to the people, to the everyday citizen. Local governments can and do make decisions that instigate positive change.

-Long Islanders use twice as much energy as the NYS average and three times as much the national average. –Richard Kessel, CEO, LIPA

Per Capita tons CO2:
USA: 5.6
NYS: 11.8
Suffolk: 25.0

In May of 2001, such a decision was made when Suffolk County, larger in population than 13 other states, decided to take action against global warming at the local level. By the end of July, 2001, a Resolution was passed by the County Legislature stating that Suffolk had signed on to join the Cities for Climate Change Campaign (CCP). A week later, New York City passed their CCP Resolution. Suffolk County successfully joined over 75 local governments within the U.S. and over 400 other localities around the world who are committed to reducing their contribution to the global warming problem. Local actions taken all over the world are creating real and substantive solutions to CO2 emissions, and the subsequent global warming, while simultaneously improving air quality, saving money, and increasing the livability of communities.

Now that Suffolk County is a CCP participant, the local government has indicated a commitment to undertake and complete five performance milestones:

1. Conduct an energy and emissions inventory and forecast
2. Establish an emissions target
3. Develop and obtain approval for the Local Action Plan
4. Implement policies and measures
5. Monitor and verify results

The five milestones are intended to be a flexible framework that can accommodate varying levels of analysis, effort, and availability of data. This report is a drafted completion of the first milestone. The following inventory results will give Suffolk a clearer picture of the quantities and sources of greenhouse gas emissions, which will help the County to save money, choose an adequate emissions reduction target, prioritize emissions concerns, and develop effective initiatives.

Suffolk County's inventory was taken for 1. Government buildings, facilities and operations and 2. Suffolk's larger community (including the residential, commercial, and industrial sectors). The greenhouse gas emissions inventory was conducted for the year 2000 and forecasted to 2010 to provide for the most up-to-date information on the sources of energy use and emissions from modes of transportation, waste, electricity, natural gas, heating oil, and diesel in Suffolk County.

Suffolk County and Global Warming

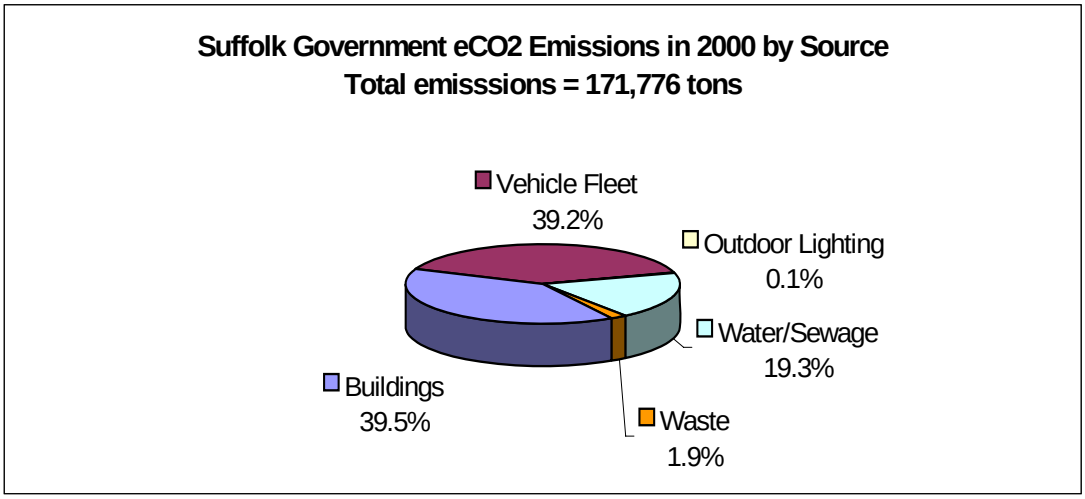
Suffolk County **will be** affected by global warming. As polar caps and glaciers melt, sea levels will rise, drowning Suffolk's shoreline property while insurance prices rise. Increased temperatures will induce droughts and affect agriculture; as well, higher temperatures will keep pushing electricity bills up through the use of air conditioners, pool pumps, dehumidifiers, and fans. An increasingly developed Suffolk County, an urbanized county, with dark rooftops and pavements, intensifies heat waves by increasing already high temperatures. Increased temperatures raise the incidences of disease and provoke smog formation related to air pollution, addressing Suffolk's potential public health issues. Over the last several years, it has been demonstrated that global warming is also yielding more frequent and extreme weather events causing millions of dollars in damage to infrastructure and threatening lives.

Suffolk County government, residences, industry, and commercial businesses are all contributing to excessive and inefficient: energy usage, transportation practices, waste production, and land usage.

Inventory Results

Suffolk County Government Buildings, Facilities, and Operations

The greenhouse gas (GHG) emissions inventory calculated that Suffolk County's buildings, facilities and operations emit a total of 171,776 tons of equivalent carbon dioxide (eCO2). The inventory accounted for the county's vehicle fleet, buildings, outdoor lights, sewage treatment and disposal, and solid waste.



The costs affiliated with these Suffolk County energy absorbers and GHG emissions producers exceed $25.7 million dollars.

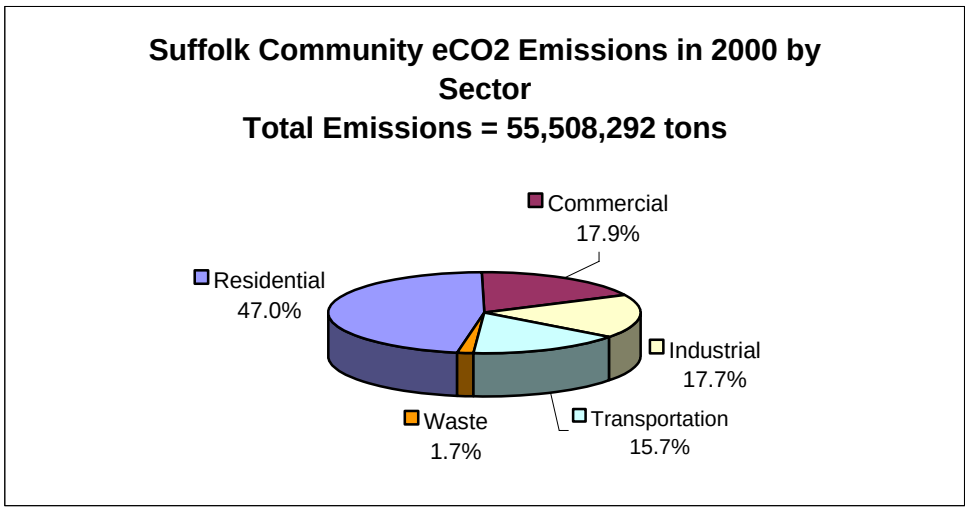
Sources and Costs of Suffolk's Government eCO2Emissions in 2000

	eCO2 (tons)	eCO2 (%)	Cost
Buildings	67,882	39.5	$15,080,479
Vehicle Fleet	67,387	39.2	$3,196,719
Outdoor Lighting	103	.1	$30,470
Water/Sewage/Sanitation	33,119	19.3	$3,545,975
Waste	3,285	1.9	$3,846,864
TOTAL			**$25,700,506**

The Larger Suffolk Community

Suffolk County residents are the highest emitters of greenhouse gases accounting for 47% of Suffolk's total emissions. This percentage is alarmingly high and cause for concern. As well, per capita emissions in Suffolk County are relatively high, compared to other communities in the United States. The New York State per capita emissions average is 11.8 tons of eCO2 annually. Suffolk ranks in at 25 tons eCO2 per capita.

The commercial, industrial, and transportation sectors all emit between 15 and 18 percent of the total community emissions. Waste emissions are misleadingly small because most of Suffolk's waste is incinerated. The ash deposited in landfills is depleted of its carbon during combustion.



Where to go from here

Now that Suffolk County knows how much energy is being used, how much greenhouse gas emissions are being produced, and where exactly the emissions are coming from, the County can take measures to become more energy efficient. To strive for energy efficiency does not single out any one entity within Suffolk County. Efficiency must be a collaborative effort.

Government operations, in the name of saving money, can take measures to operate more cost effectively. County vehicle fleets can be "greened," purchases can be deemed necessary and appropriate, 'Energy Star' office equipment can be made mandatory, ink jet printers can be used more often than the energy intensive laser printers, desk lights can replace overhead lights, buildings can be retrofitted, recycling can be enforced de facto, revolving doors can replace

‘sticky’ open/shut doors, financial car pool/public transit incentives for government employees can be offered.

Residentially, there needs to be more emphasis placed on conservation and appropriate purchases. Electric can openers, electric toothbrushes, and heated waterbeds all the way up to energy gluttonous air conditioners and pool pumps are indicative of why Suffolk County’s per capita emissions are so high. Suffolk County is relatively wealthy which directly correlates to high levels of consumption and waste. Individually plastic wrapped cheese slices and one-time-use disposable baby bibs and non-rechargeable batteries: the higher the consumption and waste, the higher the energy demand. It must be engrained in the residents of Suffolk County that their lifestyles need to become more sustainable. They also need to understand that this *does not*, in any way, mean they have to give up their quality of life. However, if global warming intensifies at the pace it has been, we will all lose some quality of life through nature’s repercussions.

List of Abbreviations and Clarifications

AADT	Average Annual Daily Traffic
Base Year	Year the inventory was conducted for—2000
CCF	Cubic foot, natural gas unit
CCP	Cities for Climate Protection
CO2	Carbon dioxide
Community Inventory	The inventory of Suffolk County including the residential, commercial, and industrial sectors
Corporate Inventory	The inventory of Suffolk County government buildings, facilities, and operations
DPW	Department of Public Works
eCO2	Carbon dioxide equivalent. Reflects the equivalent warming effect of other greenhouse gasses (such as methane) as related to carbon dioxide
EPA	Environmental Protection Agency
GHG	Greenhouse gas(es)
ICLEI	International Council for Local Environmental Initiatives
LIPA	Long Island Power Authority
mpg	Miles per gallon
MTA	Metropolitan Transportation Authority
MWh	Megawatt hours
NYS	New York State
NYS DEC	New York State Department of Environmental Conservation
NYS DOT	New York State Department of Transportation
NYSERDA	New York State Energy Research and Development Authority
SCCC	Suffolk County Community College
VMT	Vehicle Miles Traveled

Greenhouse Gas Emissions and Energy Usage Inventory
Draft Report

Introduction

On July 12, 2001, I attended the Long Island Energy Summit held in the Town of Brookhaven. During the daylong summit, there was talk of energy efficiency, alternative technologies, conservation and education, economics, consumption, meeting future demands, blackouts, and the status of energy on this very long island we live on. I heard three things that day that were a tell-all summation of the current energy conditions that exist here in Suffolk County.

The first comment was made by Mr. Richard Kessel, President of the Long Island Power Authority (LIPA). He stated that Long Islanders use too much electricity, that we use double the state average and triple the national average because: 1. rates are too low 2. a strong economy and 3. growth in construction. Pools pumps and heaters, air conditioning, and cable boxes were specifically accused as culprits, epitomizing a high standard of living.

The second comment made was by Robert Catell, Chairman and CEO of KeySpan. His comment was in response to a question regarding KeySpan's participation in global warming. He assured that global warming goes beyond the capacity of KeySpan and is an issue for the national, federal level.

The third comment was made by the gentleman sitting next to me. The speaker at the time was suggesting an everyday conservation measure that an everyday person can take is to turn the air conditioning down when we are at work. The gentleman, turning to his friend on his other side, joked, "I just don't think my dog would understand!"

The fact is Suffolk County houses many wealthy residents and companies that are used to a high quality of life equated with high consumption. Realistically, it is going to be difficult to convince Suffolk's residents and employees that they must curb their consumption, must not drive as much, must not waste as much. However, through improved technologies—economically sound technologies—energy efficiency improvements *can* be made, as is evidenced throughout the United States right now. In order to remain competitive, Suffolk County must change with the energy times. It must be instilled that the future quality of life in Suffolk mandatorily depends on change and improvements from all sectors throughout the Suffolk community.

This report is meant to show the energy usage and subsequent contribution of emissions to global warming that Suffolk County made during the year 2000. The report is neither meant to glorify nor condemn, simply to state where Suffolk's energy usage lies, what the emissions are, the price Suffolk is paying, and to make practical, economical suggestions on how to shape the future of Suffolk's energy and greenhouse gas emissions.

How Does Suffolk Compare?

Often, after the initial energy inventory has been conducted, the first thing policy makers and governments want to know is how they compare to everybody else. Comparing two localities is like comparing apples and octopuses, not even two fruits. Cities and counties vary immensely based on land use planning, accessibility and affordability of public transportation, waste disposal, political party influences, weather influences, etc. Too much stock should not be given to comparisons; with that said and knowing that Suffolk County had per capita emissions of 25 tons in 2000…

The global picture…

Top Ten Global Emitters of Carbon From Fossil Fuels

	1990-1999		1999	
Country/Region	Total emissions (in millions of tons)	Percent of Total	Total Emissions (in millions of tons)	Emissions per capita (tons)
United States	77,320	30.3%	1,520	5.6
European Union	56,280	22.1%	915	2.4
Russia	22,721	8.9%	400	2.7
Germany	18,644	7.3%	230	2.8
China	17,786	7.0%	669	.5
United Kingdom	14,366	5.6%	152	2.6
Japan	9,360	3.7%	307	2.4
France	7,241	2.8%	109	1.8
Ukraine	5,981	2.3%	104	2.1
Canada	5,831	2.3%	151	4.9

Source: World Resources Institute, "Contributions to global warming." Online. 23 July 2001. http://www.wri.org/climate/contributions_map.html. Accessed on 8 August 2001.

Globally, the United States is the worst culprit when it comes to emitting greenhouse gases with per capita emissions over two times as high as the next highest contributing region, the European Union.

Average per capita emissions in the United States is about 5.6 tons per year. In 1999, average per capita emissions in New York State were 11.8 per year. In the year 2000, average per capita emissions in Suffolk County were 25.0 tons.

So, how does Suffolk compare? Not well.

Within the United States…

CITIES FOR CLIMATE PROTECTION CAMPAIGN (CCP)					
COMMUNITY PER-CAPITA BASELINE INVENTORY EMISSIONS COMPARISIONS					
City or Town	**Population**	**GHG Emissions (tons eCO2)**	**Per Capita (tons/person)**	**Baseline Year for Inventory**	**Year Inventory was Conducted**
Santa Fe, NM	55,859	1,418,819	25.4	1990	1990
Newton, MA	82,585	1,973,540	23.9	1990	1990
Watertown, MA	33,284	695,675	20.9	1999	2001
Fort Collins, CO	87,758	1,673,861	19.1	1990	2001
Augusta, ME	18,553	349,552	18.8	2000	2001
Saratoga Springs, NY	26,186	470,135	18.0	2000	2001
Fairfield, CT	53,000	921,584	17.4	1994	2001
Cambridge, MA	95,802	1,695,117	17.7	1990	1999
New Haven, CT	123,626	2,026,201	16.4	1999	2001
Nashua, NH	86,605	1,301,817	15.0	2000	2001
Santa Cruz, CA	54,575	747,679	13.7	1990	1990
Northampton, MA	28,978	395,335	13.6	2000	2001
New Rochelle, NY	72,182	985,112	13.6	2000	2001
Buffalo, NY	309,035	3,966,716	12.8	1999	2001
Medford, MA	57,400	696,112	12.1	1995	1999
Gloucester, MA	29,456	351,908	11.9	1998	2001
Brookline, MA	54,718	626,512	11.4	1995	2000
Burlington, VT	39,127	438,931	11.2	1990	1990
Amherst, MA	34,874	380,904	10.9	1997	2001
Somerville, MA	77,098	751,729	9.8	1997	2001
Arlington, MA	43,835	335,063	7.6	1997	1997
County					
Suffolk County, NY	**1,419,420**	**35,500,392**	**25.0**	**2000**	**2001**
Tompkins County, NY	96,500	1,384,209	14.3	1998	2001
Westchester County, NY	905,572	11,943,626	13.1	1999	2001
State					
New York State	18,976,457	223,660,800	11.8	1999	

The above chart is certainly not an exhaustive list of CCP communities that have completed an inventory such as this. A complete listing of CCP member towns, cities, and counties can be found at www.iclei.org. The chart shows that when compared, Suffolk County has a much higher population than most of the other CCP localities mentioned, and therefore, Suffolk's eCO2 emissions are proportionately higher. However, the striking difference is how much higher the per capita eCO2 emissions are. Santa Fe, New Mexico and Newton, Ma (a suburb of Boston) may have similar urban characteristics to Suffolk, describing their high per capita emissions. However, many of the localities are large urban areas or suburbs of. This is why communities need to be investigated individually and why locality comparisons can skew objectivity.

Suffolk County Government Buildings, Facilities and Operations

As was mentioned in the Executive Summary, Suffolk County Government spent over $25.7 million dollars on energy in 2000. That amount almost covers the combined 2000 budgets of the Executives Office, the Department of Economic Development, the Parks Department, and the County's Fire, Rescue, and Emergency Services.

Attempting to rank the County departments by the cost of their utility bills in 2000 is an inaccurate science in that many departments share buildings or are housed in the Riverhead and H. Lee Denissen complexes (listed in the following tables as Executive Buildings). However, in categorizing departments, the following table gives a rough breakdown in dollars paid out, reflecting the usage of electricity, natural gas, propane, heating oil, and diesel. *Not included* in the dollar figures are individual departments' vehicle fleet costs, sewage/sanitation costs, solid waste costs, or outdoor lighting costs. The "Other" entry includes: a toll house, a lock house, a tourist information center, a civil defense storage area, and Bomarc Power Plant.

Utility Expenditure by Government Department in 2000

Community College	$4,206,642.00		Civil Services	$279,390.08
Sheriff	$2,432,993.17		Probation	$154,450.53
Courts/Judicial	$1,535,814.47		Economic Development	$112,410.94
Health	$1,376,370.77		Elections	$89,713.18
Police	$1,223,612.45		Other	$76,601.33
Social Services	$860,856.81		Fire, Rescue, Emergency	$60,623.59
Executive Buildings	$772,831.41		Legislative	$56,046.94
District Attorney	$686,404.88		Cornell Co-op	$44,786.39
Parks	$597,669.00		Labor	$31,175.30
Public Works	$359,306.31		Consumer Affairs	$17,052.11

A detailed breakdown of utility usage and expenditures by individual building and account was not entered into the CCP inventory software due to the scale of Suffolk County and time restraints; but the information is available from the Suffolk County Department of Health Services.

The following shows a breakdown by Government Department of eCO2 emissions.

County Gov't eCO2 emissions (in tons) from Natural Gas, Electric, Propane, and Fuel Oil

Community College	24,909		Probation	649
Sheriff	10,519		Economic Development	511
Courts/Judicial	6,207		Elections	420
Police	5,620		Executive Buildings	361
Health	5,194		Other	343
Social Services	3,856		Fire, Rescue, Emergency	237
District Attorney	2,926		Cornell Co-op	186
Public Works	2,077		Legislative	182
Parks	1,882		Labor	122
Civil Service	1,447		Consumer Affairs	67

In comparing these two tables, utility expenditure corresponds very closely with eCO2 emissions. The only discrepancy is in Executive Buildings, which can be explained by its fuel mix, using a lot of natural gas.

In mitigating eCO2 emissions and lowering costs, Suffolk County can take the information provided in this inventory to target high emitting departments and specific energy sink buildings in need of retrofitting.

The following list is a suggested start in pinpointing unusually high expenditures from buildings or departments. Of course, county government officials will know better than I do if these costs are exorbitant relative to the function and size of the building, operation, or facility. However, the following stood out as being relatively high-costing government utility users. The labels/titles were taken directly from the county's 2000 invoice records.

☹	County Center, Riverhead	$1,675,068.69
☹	Cohalan Court Complex, Central Islip	$1,131,468.59
☹	H. Lee Dennison Building, Hauppauge	$772,196.98
☹	Forensic Science Building, District Attorney's Office, N. Complex, Hauppauge	$680,233.82
☹	Skilled Nursing Facility, Yaphank	$568,596.73
☹	Police Headquarters, Yaphank	$495,877.43
☹	Public Works and G.S., Yaphank	$211,137.26
☹	Sheriff Honor Farm	$192,923.30
☹	Health, Hauppauge	$116,850.06
☹	Probation, Yaphank	$114,639.60
☹	Gabreski Airport	$112,410.94
☹	Board of Election, Yaphank	$89,713.18
☹	S. Brookhaven Health Center, Mastic	$89,338.79
☹	3rd Police Precinct, Bay Shore	$88,983.52
☹	5th Police Precinct, Patchogue	$85,453.41
☹	Court House, Community Juror, DA, Riverhead	$83,607.89
☹	Civil Defense Storage, Westhampton	$44,508.45
☹	West Hampton Bridge Lights	$8,101.14

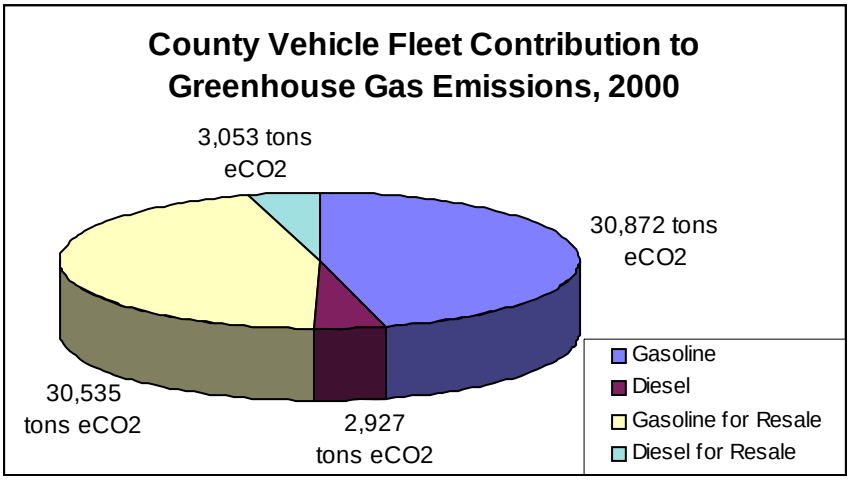
Suffolk County Government's Vehicle Fleet

Suffolk County's data collection for their vehicle fleet is slightly flawed. Or else, Suffolk County is covertly experimenting with amazingly-unheard-of fuel efficient vehicles. For example, there is a county owned sedan that supposedly went 44,371 miles in 2000, on only 41 gallons of gas giving the vehicle a fuel efficiency of 1,074 miles to the gallon. This was the most extreme case but certainly not the only unbelievable entry in the vehicle inventory.

While the vehicle fleet data cannot be used to make accurate vehicle analyses based on data errors in gasoline or diesel consumption, it can be used to draw general conclusions.

Assuming that the gasoline data collected for Suffolk County's vehicle fleet was a conservative account, an understated estimate is that the County's vehicles emitted a total of 67,387 tons of eCO2 into the atmosphere; that represents 39.2% of Suffolk County government's total greenhouse gas emissions. The vehicle fleet's cost of gas, diesel, and oil was $3,196,719. This accounts for 13.8% of the government's total energy costs. And, this dollar figure does *not* include maintenance and new purchase costs.

The following chart shows that there were nearly as many gallons of diesel and gasoline purchased for use as there was for resale (to entities such as the County Library system and the Community College); and, the fuel purchased for the county's vehicle fleet contributed a total of 67,387 tons of eCO2 emissions into the atmosphere in 2000.



The following table lists the 2000 vehicle fleet information by county department including: number of vehicles per department, the range in miles per gallon (mpg) within a department's fleet, the median and mode year of the vehicles, fuel usage, miles per gallon, and average mpg.

County Fleet Breakdown by Department and Fuel Efficiency of Vehicles, 2000

Department	# of Vehicles	Range in mpg	Median Vehicle Year	Mode Vehicle Year	Amount of Fuel Used (gal)	Mileage	Average mpg
Audit/Control	9	15-65	1999	1994	3,744.8	88,961	26
Board of Elections	8	9-34	1999	1999	3,187.2	63,718	20
Consumer Affairs	8	20-29	1999	1999	3,680.2	89,664	25
County Clerk	6	14-31	1999	1999	2,964.2	63,143	22
County Executive	18	6-43	1999	1999	12,028.1	216,620	23
Cons.	26	3-27	1992	1999	11,155.2	175,919	16
Civil Service	19	8-32	1999	1999	13,306.4	200,485	18
District Attorney	132	8-237	1999	1999	82,832.1	1,559,133	21
Dept. Public Works	462	0-84	1996	1999	509,264.2	4,848,198	13
Econ. Development	8	2-49	1994	1999	4,433.7	54,772	16
Fire, Rescue, Emer.	15	4-25	1996	1996	13,365.1	174,211	13
Health	144	3-259	1999	1999	107,230.3	1,828,456	20
Labor	85	7-30	1999	1998	42,619.2	577,864	13
Legislative	25	14-61	1996	1994	12,050.8	227,216	21
Public Administ.	2	25-98	1999	1999	740.3	37,294	123
Parks	134	4-161	1996	1996	121,067.1	1,454,530	14
Police	1261	0-723	1999	1999	1,662,893.9	18,885,365	17
Police-PAL	10	13-38	1998	1998	9,907	184,273	19
Planning	11	5-28	1999	1999	5,950.2	114,861	19
Probation	26	9-38	1998	1999	21,909.8	486,299	23
Real Prop. Tax	2	24-29	1999	1999	752.2	20,455	26

Department	# of Vehicles	Range in mpg	Median Vehicle Year	Mode Vehicle Year	Amount of Fuel Used (gal)	Mileage	Average mpg
Sheriff	271	4-54	1997	1995	267,648.3	4,082,524	16
Soil	1	17	1999	1999	930.2	15,768	17
Social Services	53	6-55	99	99	48,664.3	8,792,000	19
Treasury	5	18-25	1999	1999	2,717.1	60,112	26
Other (no dept.)	149	0-1074	1995	1995	70,051.8	818,999	23

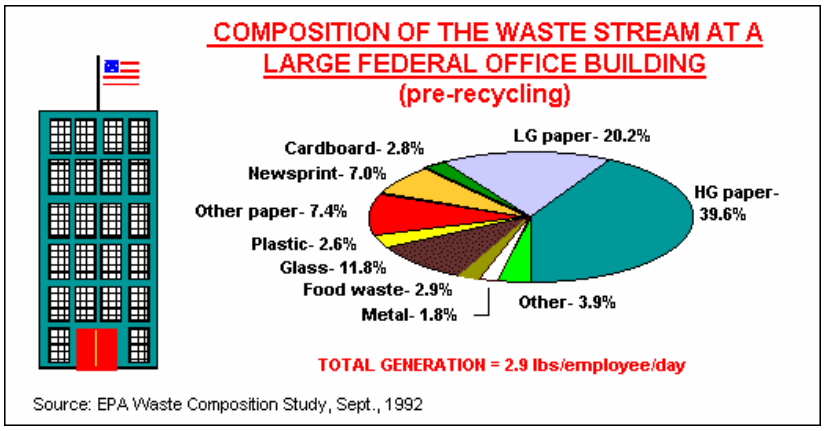
The information in the table is reflective of a flawed data collection system in that either the incorrect mileage of the vehicles or the incorrect fuel consumption is being recorded, as is proven by some of the fuel efficiencies. For example, the Department of Public Administration is reported to have a fleet with an average fuel efficiency of 123 mpg.

A summation of this table is that in 2000, the county:

- owned, operated and maintained a total of 2890 vehicles
- used 3,035,840.7 gallons combined of diesel and gasoline
- drove 37,223,890 miles
- has an average fuel efficiency of 17 mpg for county vehicles

Suffolk County Government's Waste

Suffolk's government does not keep track of the waste it produces. Nor do they recycle in their offices, for the most part. For the purposes of this inventory, waste numbers came from the Environmental Protection Agency's Municipal Solid Waste Factbook.



It was calculated that approximately 80% of Suffolk's 13,000 county employees worked in an office setting 248 days of 2000, producing 2.9 lbs/employee/day for a total of 7,479,680 tons of waste per year. This equates into 3,825 tons of eCO2 emitted from Suffolk County employees in 2000.

Suffolk County paid $3,846,864 in hauling costs last year, $3,145,404 of which was for the hauling of sludge alone.

Suffolk Government's Water/Sewage/Sanitation, 2000

	eCO2 emissions (tons)	Expenditures
Suffolk County	31,542	$3,240,164
S.C. Community College	33,119	$3,545,975

What Can Suffolk County Government Do to Reduce Their Costs and Emissions?

Buildings

Retrofit buildings—Identify the buildings that are the largest energy sinks for the county and replace lightbulbs with energy efficient ones, replace old florescents with new ballasts and tubes. Replace "sticky" open/close doors with revolving doors that help to maintain the indoor temperature near doorways, prevent heat/air conditioning loss, and prevents draft. Replace old leaky windows with new glass technology. Replace non-opening windows with windows that open to reduce dependence on ventilation systems while improving indoor air quality. For more information: http://194.178.172.86/reports/ar_08.htm#assessing

Testimonial: The City of Toledo retrofitted 20 facilities with new heating, ventilation and cooling systems; energy efficient lighting; and better insulation. The retrofit has cut Toledo's energy bills by over $700,000 a year.

Switch to LEDs—LED lights, used for exit signs and traffic lights, use 80-90% less energy than conventional lights. For more information: www.ledexit.com

Testimonial: Overland Park, Kansas replaced 2023 red traffic signals with DED fiixtures. With annual savings of over $160,000, the LED investment will be paid back in less than eighteen months.

Energy Efficiency and Conservation—Post stickers by the light switches to remind employees to turn the lights out at the end of the day. Provide desk top lamps that use less energy than overhead lighting. Place motion-sensored lighting in conference rooms, kitchenettes, and bathrooms. Turn off laser printers at the end of the day; use ink jet printers instead of laser printers whenever possible, as ink jets are less energy intensive. Encourage reductions in wasteful printing jobs.

Energy Star Products and Purchases—Mandate the purchase of Energy Star, efficient office appliances such as printers, copier machines, computers, coffee makers, pencil sharpeners, and refrigerators. Buy recycled paper and implement necessity only purchases. For more info: www.energystar.gov/

Testimonial: State and local governments spend over $25 billion a year purchasing energy using products and over $10 billion to power those products. Specifying energy efficiency in purchasing policies can cut energy costs by 25 to 50%. The State of Massachusetts purchases PCs, fax machines, copiers and appliances that meet the E.P.A's Energy Star efficiency standards. Portland, Oregon also requires the Energy Star purchasin, with energy savings at over $35,000 per year.

Planning—During the planning stages, new buildings can use technology, landscape design, orientation to the sun, construction materials, and plain common sense planning to help design buildings that are energy efficient, utilize natural sunlight, and are functional pieces of infrastructure. Design solar panels into the structure of the buildings for a self-sustaining building. For more information: Energy and Environmental Building Association, www.eeba.org

Transportation

Green the County Fleet—A fleet of vehicles represents a significant source of air pollution; every gallon of fuel burned emits about 22 pounds of CO2 which more or less equate into a 20 pound bag of coal you would buy for your barbecue.

- "Right-size" vehicle fleets by downsizing and eliminating vehicles
- Optimize vehicle travel, operation, and maintenance
- Substitute other travel modes or reduce the need to travel (conference calls instead of meetings)
- Purchase fuel efficient, alternatively fueled, electric and hybrid vehicles

For more information: www.greenfleets.org

> *Testimonial: In Denver, the Mayor enacted a "Green Fleets Executive Order" to improve the energy efficiency of the City's 3,500 vehicles. Denver's policy has eliminated 47 vehicles, and saved over $150,000 in fuel and vehicle costs. Hybrid vehicles and other technologies are making new vehicles even more fuel efficient.*

Accurate Data Collection—Upgrade and improve the data collection process so that county inventories and records on energy usage and expenditures are accurate.

Target the Commuter—Provide transit and vanpool subsidies, encourage carpools, use parking as a lever, promote telecommuting and flexible scheduling, guarantee a ride home to county employees when needed if they take public transit or carpool.

> *Testimonial: Hillsborough County, FL offers a $20 monthly subsidy to each vanpool rider and a 50% subsidy on bus passes to employees, resulting in 67,200 fewer miles being traveled by commuters.*

Waste

Reduce, Reuse, Recycle—Plain and Simple. Paper, plastics, glass, metal. For more information: www.ci.fort-collins.co.us/recycling/officeguide.php

Research and Development—Because such a large cost of Suffolk's waste costs, over $3 million, are attributed to hauling sludge, research should be done to find an alternative, profitable use for the sludge. Technologies exist to turn sludge into biosolids fertilizer, cement, and pellets.
For more information: www.mwra.state.ma.us/sewer/html/sewssc.htm
www.state.nj.us/transportation/maritime/Endesco.htm

Other

Energy Audits—Require each Suffolk County government department to conduct an annual departmental energy audit during budget requests, incorporating measures that the department can take to reduce their energy consumption and waste production, thus cutting costs.

Suffolk Community Inventory

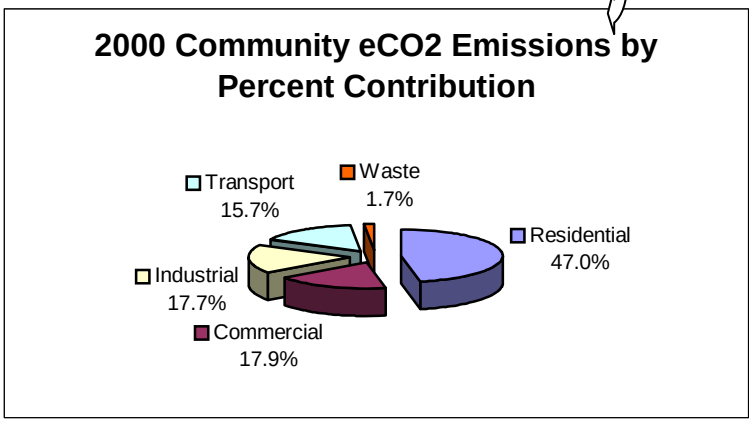
As was mentioned in the Executive Summary, Suffolk County's 2000 community inventory is dominated by the fact that the residential sector contributes 47% of the total eCO2 emissions. Suffolk County residents and employees alike, comprising the larger Suffolk community, are responsible for emitting 25.0 tons of eCO2 per person per year. This is over twice the New York State average, which is 11.8 tons eCO2 per capita, and over four times as much as the national average at 5.6 tons of eCO2 per capita.

Anyone who has driven in Suffolk County knows that we like to drive. A lot. Traffic and congestion, such as on the LIE to the left, prove this. The transportation sector of the community inventory accounted for 15.7% of the total eCO2 emissions. Employees of CCP and ICLEI saw this number and were surprised by how low the percentage was based on the tons of eCO2 being so relatively high compared to other communities at 5,576,463 tons of eCO2 released in 2000. However, because the residential emissions are so high, they pushed the transportation percentage down. Unfortunately, 15.7% is not a shocking number, although based on tons of emissions, it should be.

The industrial sector contributed 17.7% of the total emissions with 6,286,916 tons of eCO2 emissions. The commercial sector was just slightly higher with a 17.9% claim on the emissions at 6,357,910 tons of eCO2. Waste emissions are low due to high incineration in Suffolk

Community Greenhouse Gas Emissions and Energy Used in 2000 by Sector

	eCO2 (tons)	eCO2 (%)	Energy (million Btu)
Residential	16,694,707	47.0	233,949,437
Commercial	6,357,910	17.9	89,565,670
Industrial	6,286,916	17.7	86,734,102
Transportation	5,576,463	15.7	64,293,661
Waste	592,535	1.7	
Total	**35,508,531**	**100**	**474,542,870**



Unused Data

There was some data I collected that either did not fit into the CCP software or was not able to be used in the inventory, but is nevertheless relevant to this energy and emissions inventory.

For the transportation sector, I was able to collect bus transit information from Garry Lenberger in the DPW. Unfortunately, because my transportation information came in AADT, and because traffic counts on state and county roads do not distinguish between vehicle classification, there was no way for me to try and factor out the county's busses from the overall totals. However, the CCP software automatically has emissions coefficients and NYS standards for percent vehicle classification breakdown on the average road for local/collectors, major arterials, and limited access highways. This would take busses into account. The following is the county bus information that was collected but not incorporated.

BUSES

Fixed Bus Route Fleet	
Number of Buses	161
Number of Gallons Used	1,374,734
Total Vehicle Miles	7,221,846
Miles Per Gallon (efficiency)	5.25
Fuel type	diesel
Demand-Response Bus Fleet	
Number of Buses	47
Number of Gallons Used	198,227
Total Vehicle Miles	1,828,183
Miles Per Gallon (efficiency)	9.22
Fuel Type	diesel

(source: garry lenberger, DPW, Transport, 7/10/01, 852-4872)

Another piece of information collected but not used is regarding recycling. According to the NYS DEC's publication, "The New York State Recycling Bulletin 1999," the 1998 average for recycling was 42% of total waste stream recycled. Suffolk County recycled an average of 37%. Notice that Riverhead (16%), Babylon (28%) and Smithtown (29%) are very low while Southampton (51%), East Hampton (49%), and Shelter Island (48%) bring the collective average back up. Either way, *Suffolk does not reach the state average for recycling*.

Amount and Percent of Waste Produced and Recycled by Towns in 1998

Town	Solid Waste Generated (tons)	Disposed (tons)	Recycled (tons)	% Recycled
Babylon	247,739	178,688	69,051	28
Brookhaven	289,461	191,957	97,504	34
East Hampton	32,468	16,500	15,968	49
Huntington	173,639	113,804	59,835	34
Islip	330,969	204,443	126,526	38
Riverhead (year 2000)	17,775	14,879	2,896	16
Shelter Island	4,871	2,512	2,359	48
Smithtown	146,112	103,522	42,590	29
Southampton	14,438	7,139	7,299	51
Southold (year 2000)	36,391	19,530	16,861	46
Totals	**1,293,863**	**852,974**	**440,889**	**(Avg.) 37%**

Also relating to waste, let it be known that waste to energy, resource recovery facilities (to recover methane) exist in Islip, Huntington, Babylon, and Southampton and run at an average 75% recovery efficiency, according to Anit Patel in the NYS DEC.

Bill Sanok from the Cornell Cooperative Extension was able to provide rough estimates on numbers of various anthropocentric livestock in Suffolk County, which do in fact contribute methane that would have been translated into eCO2. In 1997, Suffolk County had roughly:

- 176 cattle
- 30,000 horses
- 600 hogs
- 3,200 chickens
- 6,700 turkeys
- 300 sheep
- 2,000,000 ducks
- 123 geese (not wild)
- 300 goats

What Can the Larger Suffolk Community Do to Reduce Their Emissions?

Residential, Transportation, Industrial, Commercial: One Suffolk Community

Curb the car—Residents need to be urged to use public transportation more. Also, they need to drive less. While the federal government works on passing legislation demanding better fuel efficiency for cars and SUVs (urban assault vehicles), individuals can make educated purchasing decisions on the cars they drive based on economy and efficiency. Measures can be taken to make alternatives to driving more appealing such as: more and wider sidewalks, pedestrian walkways across heavily used local roads, bike lanes, more affordable mass transportation. For more information: www.greenfleets.org

Alternatively fueled vehicles: Provide tax breaks and subsidies for electric and hybrid vehicles such as the Toyota Prius, as seen on the left, or the Honda Insight. Such vehicles are not only economical but will contribute greatly to reducing greenhouse gas emissions.

Mass Transportation—Changes can be taken to make mass transportation more realistic. Placing bike lockers at the train stations, providing showers in the work place, and providing parking spaces at offices, malls, and large arenas for carpools. Make bus passes and transit map information more readily available to Suffolk's residents. Incorporate HOV lanes on some of the more heavily traveled local roads or incorporate tolls for single occupancy cars on the highly traveled parkways and expressways

Buy and Encourage Green Power—Prepared municipalities can use electric utility deregulation to advance less polluting renewable power—such as solar, geothermal, wind, and hydroelectric power. The south shore of Suffolk County has been named one of the prime spots in the United States for wind energy. Large and small-scale solar projects can be implemented and researched. Encourage participation in Long Island Shines and the Long Island Solar Roofs Initiative. For more information: www.eren.doe.gov/greenpower and www.energymatters.org/lishines and www.awea.org

Testimonial: Moorhead, Minnesota's municipal utility runs "Capture the Wind," allowing Moorhead customers to choose wind power. The wind power option sold out in less than 2 weeks and financed the construction of a 750-kilowatt wind turbine.

Small-scale renewables—There are currently many realistic, cost-effective, small-scale renewable energy technologies out there, such as photovoltaic outdoor lighting and road signs, solar water and pool heaters, and solar powered home systems. Only, the information needs to be put into the hands of the purchaser, the resident, the business, the opportunist.

Zoning and Planning—Create urban growth boundaries, or Greenlines. New development supposedly brings new revenues. But, uncontrolled sprawl requires costly outlays-miles of road, police and fire services, and other facilities-typically costing far more than the revenues generated. Instead of subsidizing sprawl, create a growth boundary limiting urban development. Traffic is also minimized with condensed urban planning. For more information: www.smartgrowth.org

> *Testimonial: San Jose, California adopted its Greenline to protect the city from undue investments in new infrastructure, preserve open space, and direct resources to existing neighborhoods. By curbing sprawl, the Greenline has slowed traffic growth, reducing smog and greenhouse gas emissions.*

Energy Smart Building Codes—With an almost shameful 47% of Suffolk's eCO2 emissions coming from the residential sector, building codes can require measures such as improved insulation and efficient lighting and appliances to improve efficiency. Low-flow shower heats, compact fluorescent bulbs and energy efficient appliances, weather-stripping of doors and windows, attic insulation, wrapping of hot water tanks with blankets: these are some measures that can be regulated. For more information: www.solstice.crest.org/efficiency/bcap

> Testimonial: The City of Berkeley, California's Residential and Commercial Energy Conservation Ordinances are codes that improve the energy efficiency of existing building stock. The measures mandate basic conservation improvements at the point a property changes ownership. With lower energy bills, the upgrades typically pay for themselves rapidly.

Education—Residents cannot change what they do not know is wrong or how to change. Tools, resources and information needs to be readily available to residents about global warming, about energy efficiency, about sustainable lifestyles and choices, and about actions they can take. Support and advertise easily accessible home use tools such as the EPA's new Personal Greenhouse Gas Calculator at http://www.epa.gov/globalwarming/tools/ghg_calc.html and http://www.energyideas.org/energy_solutions/ for energy efficiency solutions for various sectors of the community including industrial and commercial.

Commercial and Industrial—Technologies exist to create more efficiently running business operations. Energy efficiency in the commercial and industrial sectors creates competitive edge and savings. Resources exist for the technical upgrades for almost every specific market such as utilities, agriculture, high-tech industries, manufacturing, etc. For more information: www.energyideas.org/energy_solutions

Work With NYSERDA—NYS Energy and Research Development Authority has established various programs aimed at helping the residential, industrial and commercial sectors become more energy efficient. "Energy Programs for the Future: Entering the 21st Century—1999-2002" states that NYSERDA's Energy Efficiency Deployment Programs target five areas: small businesses, government institutions, residential, low-income, and vehicle fleets. The programs are designed to address the specific energy needs of customers to reduce energy costs, improve affordability and comply with environmental regulations. Use research already being done, use resources, tools, organizations, and publications to help Suffolk reach its energy goals. For more information: www.nyserda.org

Energy Impact Statements—Require new developments, be they residential, commercial or industrial, to submit energy impact statements in the planning stage to be approved *before* building permits are given out. Require alternative energy submissions for energy efficiency from developers.

2010 Forecast

The CCP software has the capabilities to forecast community and corporate emissions into the future.

Community Forecast

Using growth trends and projections to 2010 from Peter Lambert in the Planning Department, NYSERDA, and the Long Island Regional Planning Board, indicator inputs showed that between 2000 and 2010, Suffolk's:

- Number of households would grow 1% annually.
- Number of commercial establishments and employees would grow by 1% annually.
- Commercial floor space would grow by 1.5% annually.
- Number of industrial establishments and employees would grow by .3% annually.
- Industrial floor space would grow by .5% annually.
- Overall population would grow by roughly 4.5%.

And New York's:

- Electric demand/send out would increase by a high estimate of 1.5%, a low estimate of .6% and an average growth estimate of 1.1%.
- Natural gas demand/send out would increase by a high estimate of 3.2%, a low estimate of 1.3% and an average growth estimate of 1.5%.

(Because Long Island's energy demand is so high, I used the high estimates of demand growth for both electric and natural gas for the forecast indicator input.)

For waste forecasting, I assumed a 1% growth per year based on NYS DEC reported growth trends.

For transportation forecasting, I assumed the 1.2% annual AADT growth agreed upon by the DPW and NYS DOT. No new roads were assumed to be built between 2000 and 2010.

Understanding that forecasting is an extreme and inexact conservative estimate, the following chart shows the forecasted growth in eCO2 emissions from 2000 to 2010 should growth measures be realized with the development path of today perpetuating.

Comparison of 2000 and 2010 eCO2 Emissions and % of Contribution by Sector

	2000 eCO2 (tons)	2010 eCO2 (tons)		2000 eCO2 (%)	2010 eCO2 (%)
Residential	16,694,707	18,985,436		47.0	47.3
Commercial	6,357,910	7,175,594		17.9	17.9
Industrial	6,286,916	7,043,854		17.7	17.6
Transportation	5,576,463	6,194,480		15.7	15.4
Waste	592,535	711,041		1.7	1.8
Total	**35,508,531**	**40,110,406**		**100**	**100**

Corporate Forecast

The Corporate Forecast was the only part of the inventory that I did not finish due to time constraints and because of the size and scope of conducting an energy audit for Suffolk County. Completing the Suffolk County Corporate (government) Forecast should take no more than a few hours entailing making some phone calls and entering the data into the CCP inventory software.

I have started collecting the information regarding the county's projected development projects expected. According to Tedd Godek, DPW, County Architect, the following development plans should be carried out between 2000 and 2010. Tom LaGuardia, also in the DPW, provided the approximate square footage and utility costs associated with each development plan.

Planned Development	Square Footage
Addition to Griffing Street Supreme Court House	60,000
New 6th precinct police station in Coram	30,000
Renovation of Riverhead County Center	no growth
Courts to Cohalen	30,000
Renovation of Old Home and Infirmary in Yaphank	75,000
280 bed replacement correctional facility in Yaphank	50,000
New juvenile detention center, Yaphank	28,000
Replacement DWI facility, Yaphank	30,000

According to Mr. LaGuardia, in 1999, utility records show that 20.5 KWh of electricity was used per ft^2 at an average price of $2.16/ft^2. Gas prices were $950,000 for 2,040,000 x 100 ft^2. Heating oil accounted for $562,000 at 1,022,00 ft^2. Not all buildings use gas and heating oil. He said the mix was probably about 65%gas and 35% fuel oil.

Paul Cooper from the SCCC provided the development plans for the college:

- New Instructional Building, Selden Campus
  -Average annual heat in BTU hours per ft^2 is 140.5 MBH, area of building will be 60,000 ft^2, fuel oil at $1.80/gallon. Estimated annual heating cost: $128,593.
  -Average annual electric consumption per ft^2 is 12.93 KWh, area of building will be 60,000 ft^2, electric at $.14/KWh. Estimated annual electricity cost: $201,552.
- New Instructional Building, West Campus
  -Average annual heat in BTU hours per ft^2 is 82.4 MBH, area of building will be 17,119 ft^2, fuel oil at $1.80/gallon. Estimated annual heating cost: $21,133.
  -Average annual electric consumption per ft^2 is 20.0 KWh, area of building will be 17,119 ft^2, electric at $.14/KWh. Estimated annual electricity cost: $55,252.
- New Cibrary, East Campus
  -Average annual heat in BTU hours per ft^2 is 77.7 MBH, area of building will be 39,192 ft^2, fuel oil at $1.80/gallon. Estimated annual heating cost: $46,452.
  -Average annual electric consumption per ft^2 is 21.1 KWh, area of building will be 39,192 ft^2, electric at $.14/KWh. Estimated annual electricity cost: $113,557.

For the county vehicle fleet forecast, Lorraine Hickey in the DPW says that the vehicle fleet will not expand unless the employee base expands. The vehicle fleet has a replacement policy, a vehicle for a vehicle. Where I was in my data search for the corporate forecast ended with trying to find out—from the Budget Office, the County Executive's office, from Civil Service, and anyone else who would talk to me—roughly how many employees are expected to be hired in the next 10 years.

Methodology

The inventory required data and technical information to be collected from a wide range of sources including:

- Town Offices: Towns of Southold and Riverhead Solid Waste Management Offices
- County Departments: Department of Public Works, Planning Department, Executives Office, Parks Department, Suffolk County Community College, Auditing and Control
- State Agencies and Offices: Metropolitan Transportation Authority, NYS Energy and Research Development Authority, NYS Department of Transportation, NYS Department of Environmental Conservation
- Local Utilities: Long Island Power Authority, KeySpan
- Other: Long Island Oil Heat Institute, Vitale Propane

The files, data, disks, papers, and faxes containing the collected information for this inventory now reside with the Department of Health Services, Division of Environmental Quality.

How the CCP software works is I collected and entered the numbers in untis of tons, gallons, therms, megawatts, etc. The software then uses coefficients, conversion calculators and state specific standards to convert the information into a streamlined unit of energy (Btu) and tons of eCO2 emissions.

Corporate Inventory

Buildings, Facilities, and Operations: The electric and natural gas utility costs for all county buildings, facilities and operations, except the Parks Department and Suffolk County Community College, were gathered through Kathy Moller of the Department of Public Works. The information was sent to me in Microsoft Excel files of which I went through and compiled the needed data into workable spreadsheets. I separated the utilities into outdoor lighting, sewage treatment facilities, and buildings for electric, natural gas, and fuel oil.

Paul Cooper from Suffolk County Community College (SCCC) faxed over the utility bills for the three different SCCC campuses, for electric, natural gas, and fuel oil.

I spent two days in the Parks Department working with Barbara Russo who provided me with the Parks' utility ledgers for 2000.

The data on the quantities purchased and the expenditures for Suffolk County's buildings, operations, and facilities on natural gas, electricity and fuel oil are accurate down to the dollar; for, the numbers were taken straight from the utility bills. Any errors are from oversight or a margin of human error.

Data on propane usage was collected from Bonnie Cakouros at Vitale Bottled Gas, Inc who holds the county's propane contract. The numbers that Bonnie provided me were close estimates given with confidence, although not precisely exact. The cost per gallon of propane was averaged at $1.26, not reflecting the exact cost paid by the county.

Data was collected in MWh (megawatt hours), CCF (cubic feet), therms, and gallons. The CCP software converted these into a universally applied unit of a British thermal unit (Btu) to quantify energy.

The indicator inputs on county government buildings, facilities and operations were gathered from a couple different people. Floor area was estimated and given by Peter Lambert in the Planning Department. The number of county employees was provided by Janice Boman, Auditing and Control Office.

County Vehicle Fleet: Lorraine Hickey in the Department of Public Works was amazingly helpful and cooperative about providing information on the county's vehicle fleet. She sent me a spreadsheet titled "2000 Fleet and Fuel Record Report," which categorized the county's fleet into department, car type, diesel or regular gas, person assigned to, miles driven, amount of gas used, and miles per gallon (mpg), among others. She and Barbara Russo (Parks) provided amounts and costs for gasoline purchased for resale, which was placed in a separate category in the inventory.

The costs for the vehicle fleet were given in two separate lump numbers: cost for resale gasoline and cost of county fleet gasoline and oil combined.

Water/Sewage Treatment and Disposal: From the utility bills provided by Kathy Moller (DPW) and Paul Cooper (SCCC) I was able to tease out the accounts for sanitation and sewage treatment.

Waste: Suffolk County government does not collect data on their waste produced. Therefore, Janice Boman (Auditing and Control) said there were 13,000 Suffolk County employees working 248 days in 2000. Peter Lambert (Planning) estimated that about 80% of those employees worked in an office setting. According to a study by the Environmental Protection Agency (EPA), the standard for waste production at a large federal office building is 2.9 lbs/person/day (source: 'EPA Composition of the Waste Stream at a Large Federal Office Building,' www.epa.gov/epaoswer/non-hw/muncpl/factbook/internet/mswf/gen.htm#10). Therefore, the waste amounts produced by Suffolk County are an estimated calculation.

The CCP software takes the total tonnage of waste and automatically breaks it down, using state specific standards and coefficients, into distinct categories of paper, food waste, and all other.

The costs entered into the inventory were provided by Kathy Moller (DPW) and include an accurate total amount paid to haulers for county waste and sludge.

Community Inventory

Residential: The households indicator input data was collected from the 2000 U.S. Census and Peter Lambert in the Planning Department. The electricity number was collected from Joanne Doolin at the Long Island Power Authority (LIPA).

The natural gas number is from Mike Augustine at KeySpan. The natural gas number entered in the software is for July 2000 to July of 2001. Mr. Augustine said these numbers were the best he could provide me with and assured me that the 6 month discrepancy would not affect the accuracy of my data; as, he claims that the difference in demand would have been minute.

The natural gas number came from Kevin Rooney of the Long Island Oil Heat Institute.

All three numbers, for electric, natural gas, and fuel oil are accurate to the point that they were collected straight from the utility sources and not roughly calculated based on square footage, heating days, and state averages. However, all three sources say they had usage figures for

Suffolk and Nassau Counties combined. They calculated the Suffolk usage by multiplying the total usage by their best-estimated percentage of customers residing in Suffolk County.

Commercial and Industrial: Indicator inputs for number of commercial and industrial employees, establishments, and square footage were given by Peter Lambert in the Planning Department for the years 1998 and 1999. These figures, Suffolk County population growth, and calculated growth trends were used to provide a conservative approximation for the 2000 numbers that were entered into the inventory. Mathematical calculations and detailed, explicative rationale can be found as an appendix to this report.

Joanne Doolin in LIPA provided separate numbers for electric usage for the commercial and industrial sectors for Suffolk County. Again, as with the residential numbers, LIPA based the numbers on percentage of commercial and industrial customer in Suffolk County from a total Suffolk/Nassau usage number.

The natural gas numbers were provided by Mike Augustine at KeySpan and reflect the usage for July 2000 to July 2001. The rationale and justification is explained in the previous residential section. Natural gas for commercial and industrial were given as a single figure; as, KeySpan does not distinguish between the two. Based on square footage of each sector in Suffolk and based on electric distribution, I calculated that commercial constituted for 47% of the conglomerate number and industrial for 53%. Mathematical calculations and detailed, explicative rationale can be found as an appendix to this report.

Multifamily houses were given to me as a separate figure and are considered commercial by KeySpan and for the purposes of this inventory. As distinguished and defined by Peter Lambert in the Planning Department, the U.S. Census, and Jim Pim in the Division of Environmental Quality the following assumptions were made for this inventory:

Industrial enterprises in Suffolk include: mining, utilities, construction and manufacturing. Commercial enterprises include all others.

Heating/fuel oil information from Kevin Rooney at the Long Island Oil Heat Institute came in a single combined commercial/industrial number. I applied the same 47/53% delineation to separate the two numbers for the software. Again the mathematical explanation can be found as an appendix.

Transportation: Rail transportation information was collected from Bob Cividanes at the Metropolitan Transport Authority (MTA). He was able to give me the total number of vehicle miles traveled (vmt) on the Long Island Rail Road (LIRR) for both diesel and electric trains. For all of LIRR, diesel vmt equaled 1,829,800 in 2000 and electric vmt in 2000 equaled 6,385,000. I took a map of the LIRR and measured with a ruler to the nearest 1/8 of an inch to figure out what percent of the track lays in Suffolk County (47.6). From those best estimates, I calculated out the vmt on Suffolk's portion of the LIRR. Therefore, the numbers entered into the software for the inventory are not exact.

For road transport, my state roads, NYS Department of Transportation (NYS DOT) contact was Bill Thornewell and county road contact was the amazingly helpful and efficient Laura Palmer in the DPW. Both provided average annual daily traffic (AADT) counts for their respective jurisdictions. Both agreed that annual increase in AADT was 1.2%. NYS DOT gave me 2000 AADT counts by specific sections of road. I multiplied the AADT counts by the miles per

section of road which gave me vmt. For the county roads, the same process was applied; only, for some roads the AADT counts were conducted in different years, mostly 1999 but ranged from 1995 to 2001. I either scaled up or scaled down these AADTs for the individual sections of road based on the 1.2% annual increase.

Because the individual towns comprising Suffolk County do not conduct traffic counts on their local roads, both Laura Palmer (DPW) and the NYS DOT agreed that local roads would account for at least 15% of the total vmt for state and county roads combined.

Waste: Community waste information was gathered by Anit Patel in the NY Department of Environmental Conservation (DEC). The individual towns control waste management and the DEC regulates the towns. Mr. Patel was able to give me 2000 municipal waste stream information for most of the towns. However, I had to go to the John Reeve in the Town of Riverhead Sanitation Department to collect their 2000 information and to Jim Bumchuck in the Town of Southold's Solid Waste Management to collect their 1998 waste numbers. Data was also collected out of the NYS DEC's publication, "The New York State Recycling Bulletin 1999 Edition." The CCP software automatically breaks down tonnage of solid waste into New York standards for paper products, food waste, plant debris, and wood/textiles, each of which have their own CO2 coefficient.