ASC Energy Plan

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Prepared by ASC's Department of Community and Environmental Responsibility

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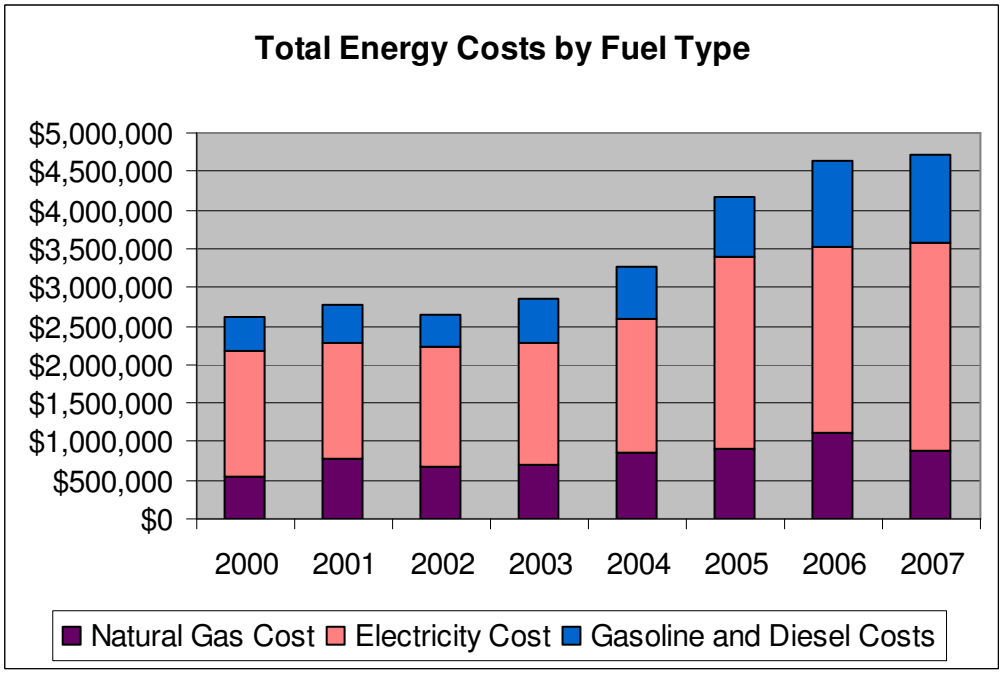
Introduction

It's time to ramp up energy savings at Aspen Skiing Company. Even though Aspen Skiing Company implemented many successful energy efficiency programs since 2000, our total energy use, and cost of energy relative to operational budget, has risen dramatically. Gas and diesel costs have climbed by 164% since 2000. Total energy costs have grown 74%. While this is mostly due to *energy price increases*, we have seen overall energy use rise as well. This is a drag on our profitability, but it's also in conflict with our guiding principles and our desire to reduce our carbon footprint, which is declining slightly (due to a cleaner power mix) but not as fast as we'd like. In January of 2008 Aspen Skiing Company developed a plan to reduce the energy intensity of its operations.



Given this backdrop, ASC has developed an Energy Plan to help the company start moving aggressively to reduce energy use, cut greenhouse gas emissions, and save money. The absolute CO2 emissions reduction goals are as follows: **10% below 2000 levels by 2012 even while growing; 25% below 2000 emissions levels by 2020**. In addition to reducing our onsite emissions, ASC will use legitimate offsetting approaches in order to ensure that all electricity, natural gas and fuel consumed will be **carbon neutral by 2020.**

This Plan is about business durability. In the late 90s, Interface Carpet, one of the largest manufacturers of floorcoverings in the U.S., and a leader in sustainable practices, implemented some $300 million in energy and materials cost reductions. According to founder and chairman Ray Anderson, these programs literally saved the company during the recession of the early 2000s. "We wouldn't have made it" without those cost reductions, Anderson said.

Overall Philosophy

The one operating principal of this report is that no one group has all the answers. Nor will large, high-profile projects get us to the reductions necessary. Instead, our savings will be realized through brainstorming and implementation at the departmental level. While ASC will continue to implement capital projects that save or produce large amounts of energy (like green building design, lighting retrofits, the hydro plant or the Nell's energy management system), in the end energy savings will occur slowly and incrementally through operations-level improvements. **A great example of this ops-level, no-cost approach came from the Little Nell this fall. Engineer Mark Fitzgerald, with support from John Speers and Paul Cherrett, reduced the outdoor pool temperature, and turned down the heat in the underground parking garage. Neither move negatively impacted guest comfort, but savings were dramatic, cost nothing, and represent just the tip of the iceberg.**

The effort we're describing requires a paradigm shift: as a company, we make money by selling lift tickets and real estate, but *also by saving energy*.

Aggressive energy savings ties to ASC's role in the community as a place where people find meaningful, stable work: when faced with an economic downturn and the need for cost cutting, a responsible and ethical community business like Aspen Skiing Company should lay off unproductive kilowatts, barrels of oil, and therms of gas, not productive and valued employees.

The end goal: get everyone rowing in the same direction, and create a culture of energy savings at ASC. The plan itself is below, broken down into timeline-based action steps.

Energy Hierarchy:
Priorities for Savings
Buildings
Snowmaking
Lifts
Vehicles

Immediately

<u>Data</u>

Environment/Community will work with Finance Department to **provide energy data** (monthly, yearly and previous month/year) to as many departments as feasible.

Tasks to be completed include:

- Working with the Finance to secure data in a timely fashion and then develop easy reporting formats that allow for efficient development and distribution of natural gas and electricity usage data.
- Developing normalization standards.

- Implementing management systems to report on fuel usage at all fueling stations.
- Engage Holy Cross Energy to look at metering information they can provide and then talk to other sub-metering firms based on this conversation.

Senior Management
Discussion of operations and energy use. Early season events and increased guest expectations for groomed terrain require significant energy use. While events and grooming are required to market our resort are there operational efficiencies that can be achieved to lessen the energy intensity of these activities?

Incentives
Environment/Community will work with Finance to explore incentives for energy savings. This will include ensuring that energy bills are actually in the appropriate budgets. An incentive program might only work in select departments, and might be rolled out as a pilot in a handful of areas.

Property Services
Implement an annual or bi-annual maintenance program for all building mechanical systems to change filters, tune boilers, inspect pumps, all with a focus on energy. Part of the maintenance can be an inspection and analysis role: has technology changed? We have 3 100,000 BTU boilers at Buttermilk…is there one that can do the job? Are the controls modern?

Buildings
Several buildings (Highlands, Treehouse, SM Gondola Ticket) have sliding glass doors without airlocks that are extremely inefficient and also freeze occupants. Property Services, Planning and Environment/Community will explore solutions, including air curtains and changes in how the doors sense movement.

The escalator at Highlands, for example, needs a sensor. We may need to change building codes to make that happen.

New Construction
Continue to focus on radical energy efficiency as main design priority. The Planning Dept. has a very solid grasp of this on projects we control; each new building ASC constructs or remodels has become a better model of efficiency. At this point ASC's business as usual is state of the art. One goal: design roofs so they don't need heat tape.

Vehicle Maintenance
To what extent is regular maintenance occurring on fleet vehicles? Tune ups, tire pressure maintenance, oil changes? Is this institutionalized, do we have the staff to do it? Purchasing will continue to explore how we might end up with an efficient fleet.

Energy Teams/Brainstorming
Environmental Affairs will **convene brainstorming meetings** with several large departments, eventually extending the meetings to every ASC department to discuss energy savings opportunities. Establish Green Teams/Energy Rangers in Lifts, Property Services, Hotels, Snowmaking. These representatives will meet monthly at Mountain Ops meeting to report on

progress. **Mike Kaplan will regularly attend this portion of the meeting.** Create list of projects in GREENTRACK *Goals* and pursue project funding as appropriate.

Lifts/Heaters

Every resort that has been successful in reducing energy use points out that lift shack heaters and lift terminal heater timers are key. ASC was a leader in this area five years ago, particularly thanks to Dave Draves' work at Snowmass, but we have not standardized the practice and new lifts have since been built. **Every mountain will inventory lift shacks and lift terminals to determine if heaters are on timers. Lift shacks without timers will be retrofitted out of operational expenses, and lift terminal heaters will be put on timers. Appropriate temperature setpoints will be established though a conversation with Poma, that will also include a discussion of other energy efficiency opportunities. Progress reporting on this effort will occur at the Mountain Ops meeting.**

Hotels

Property Services/hotel engineers will verify that all heat tape and snowmelt is connected to controls that eliminate loads when tape/snowmelt is not needed. Hotel engineers will explore alternatives to heat tape and better control systems for snowmelt.

Education

Launch an educational campaign to change behavior—encouraging employees to turn off equipment, close doors, turn down heat, etc. Through posters, meetings, outreach, internet, mail. Enviro/Community will spearhead this.

Lighting

Sylvania will undertake a **comprehensive lighting analysis** of the company. ASC will implement retrofits with outside financing if necessary.

Misc.

Install **waste oil heater** at top of Aspen Mountain to replace broken one if possible within budget. *(Done...as of 1/7…thanks Finance!)*

Install energy monitoring software at Bumps, the ABC, and Two Creeks with the goal of doing this company wide over 5 years at major facilities, and targeting the Snowmass Club as the first priority in the next fiscal year. *We are not alone on this. Vail is exploring the same monitoring equipment using the same company. This is huge.*

Install 4kW solar electric at SM golf clubhouse.

Solicit bids for solar electric system at the Nell.

Implement no cost or low cost operations savings: setback thermostats; mechanisms to reduce phantom plug loads (TVs, computer monitors, other equipment); motion sensors on lighting; timers on heat tape, engine heating blocks, etc.; reduction in heating temps where appropriate. Turn off exterior radiant heaters at lifts if possible and at hotels if weather permits.

By March 1

Conduct energy audits of the Snowmass Club, Two Creeks, Bumps, ABC, and Treehouse. (Is the latter working as expected?) and other buildings specified by Peter Hoffman.

- Identify locations where boiler replacement should be considered.

Snowmaking

Initiate a snowmaking energy working group (possibly in collaboration with lifts) including staff from all four mountains. Benchmark against other resorts by identifying an industry standard for cost/energy per cubic foot of snow made, and try to beat that target. Develop a rewards programs for snowmakers that allows departments to share in cost savings. Bring in experts in snowmaking efficiency to add to discussion. How much snow is enough? How do we determine that?

Energy Procurement/Strategy

Pursue multi-pronged approach to renewable energy production and procurement. Renewable energy, some of it onsite, is going to have to play a major role in ASC's energy future. The Forest Service is very interested in installing turbines like this one on the Cirque. Meanwhile, Ops and the Environment/Community Dept. are exploring other hydroelectric opportunities; a direct purchase of wind energy from Nebraska, at a fixed price, over 15-20 years; new renewables developments with Holy Cross Energy; and a range of solar options. Meetings on these topics are already scheduled. All of these opportunities represent a hedge for ASC but also a real world carbon reduction.

Politics/Activism

Continue to support progressive climate legislation, tiered electricity rates, improved mass transportation solutions in Aspen, the preferred alterative. Host a forum on tiered rates in Aspen, and work with NRDC on statewide forums related to the next election.

Beginning June 1, 2008

Implementation

Implement, or verify implementation of, actions determined by departmental brainstorming sessions. (This may require earlier action due to the recurring capital budget cycle.) Environment/Community will continue to identify the highest leverage large capital projects for funding.

Continue Energy Audits

Conduct **energy audits** of 5 existing buildings each year, starting with the largest energy consumers, with capital allocated to implement findings. Add to recurring capital budget as an annual expense.

Install energy monitoring software in the dozen facilities at ASC that use most energy, with public interface for guests. Make this part of a plan to install 25 over the next two years. A preliminary list follows, with annual electricity usage.

Facility	Electricity Bill (kWh)
Little Nell	$245,445
Snowmass Club	$83,740
Sundeck	$44,625
Bumps (BM Base Complex)	$37,268
Snowmass Club Pool, Spa and Wet Bar	$26,480
Golf Club House	$20,345
Indoor Tennis Building	$16,103
Two Creeks	$15,086
Merry Go Round	$13,024
Elk Camp VMF	$10,489
ABC Offices	$10,314
Cliff House	$8,982
Up 4 Pizza	$7,985
Building 7 Parking Area	$7,754

Install building automation equipment

At Bumps and Snowmass Club and make remaining repairs to Bumps as per the retrocomissioning report. (Capital project.) Install automated room controls at the Nell and at the Snowmass Club. George Kelly is currently researching this project for the Nell and it will be submitted as a recurring capital project.

Hire an energy manager

Hire a facilities energy manager (a new position we propose and which has been simultaneously considered by Ops and HR) as a revenue generating position. The energy manager will have HVAC and controls expertise and work in Property Services. Pitkin County recently decided to hire an energy manager in 2008, and the position makes sense as energy costs rise. **One of the most successful ski resort energy programs exists at Mammoth Mountain, which created the position of energy manager about five years ago.** Mammoth has reduced energy costs while growing, and one of the reasons they've been able to do this cost effectively is that they have the ability to perform energy audits and install building controls in-house.

Case Study: What Might an Energy Manager Do?

Why might we need an energy manager? Why can't we have existing staff do the work? The answer is that energy efficiency is techy and complicated, and every single thing we do at ASC has an energy savings opportunity associated with it that may not be readily apparent. The **swimming pool at the Snowmass Club** provides a good example. We are redoing the heating system. The system will become more efficient. Digging deeper… what about the pumps? Can we replace them to even further improve efficiency? By reducing pump size and run time, pools in Florida achieved 75% energy use reductions…. Can we do the same at the Snowmass Club? Bob Bradbury at Mammoth Mountain replaced a 60 HP domestic water pump with a 17 hp pump. The payback was 4 months…and he got a grant for the retrofit. That's double free money. In short, the opportunities are endless, but not obvious. What is the best pool temperature and best way to use covers? Who's thinking about this on every project at ASC, and drilling down multiple layers?

Create an Energy Trust Fund

Carve out $250k to $500k (or more?) from annual capital expenditure explicitly for energy efficiency projects. Like a roof replacement or a new restaurant, these projects should not have to meet high ROI thresholds.

Misc.

Explore **grant funding** for efficiency work.
Make it company policy that we **will buy only four-stroke snowmobiles**.

Install waste oil heaters at Divide Shop, Golf course maintenance building, and top of Aspen Mountain.

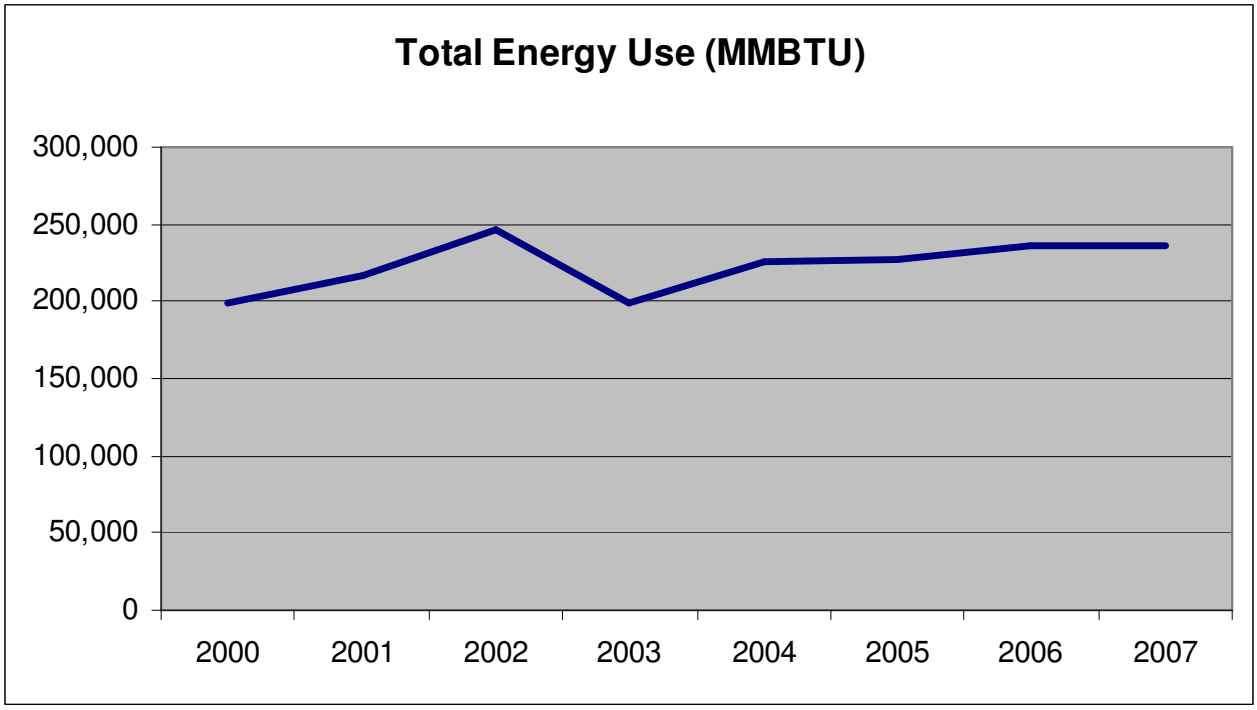
June 1, 2009

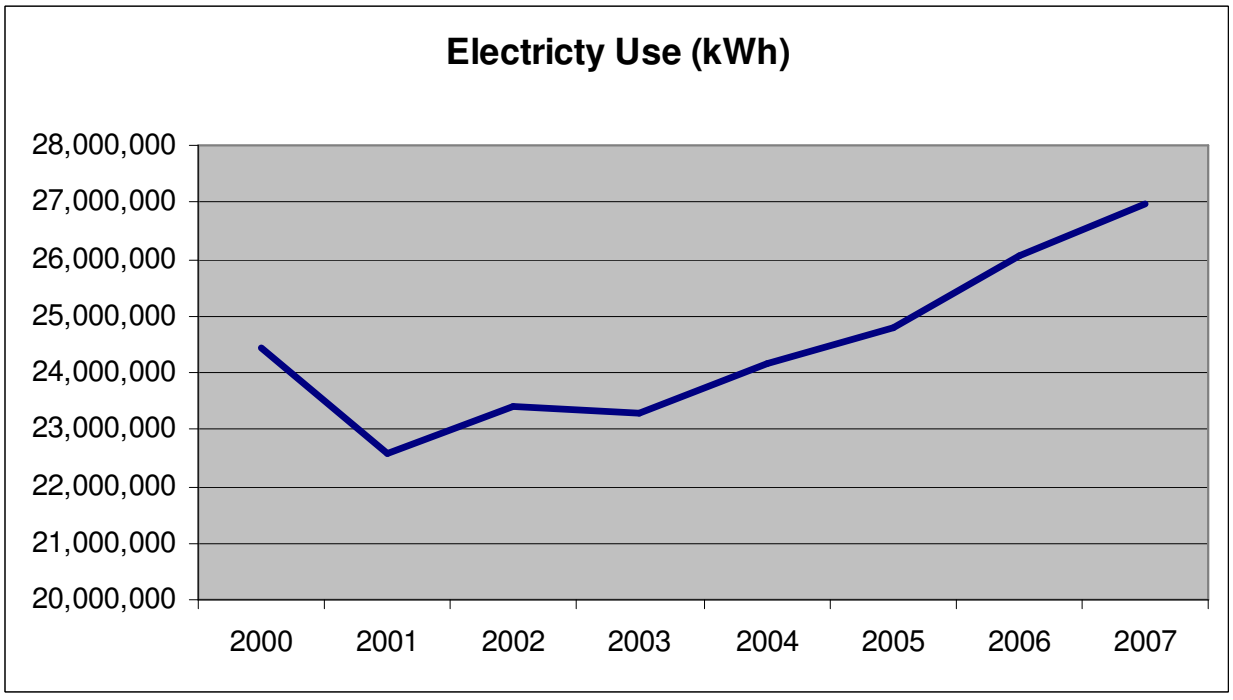
Replace boiler at AABC and fix heating system, possibly by eliminating ancient rooftop evaporative cooling unit and replacing with AC unit. (Recurring capital project.)

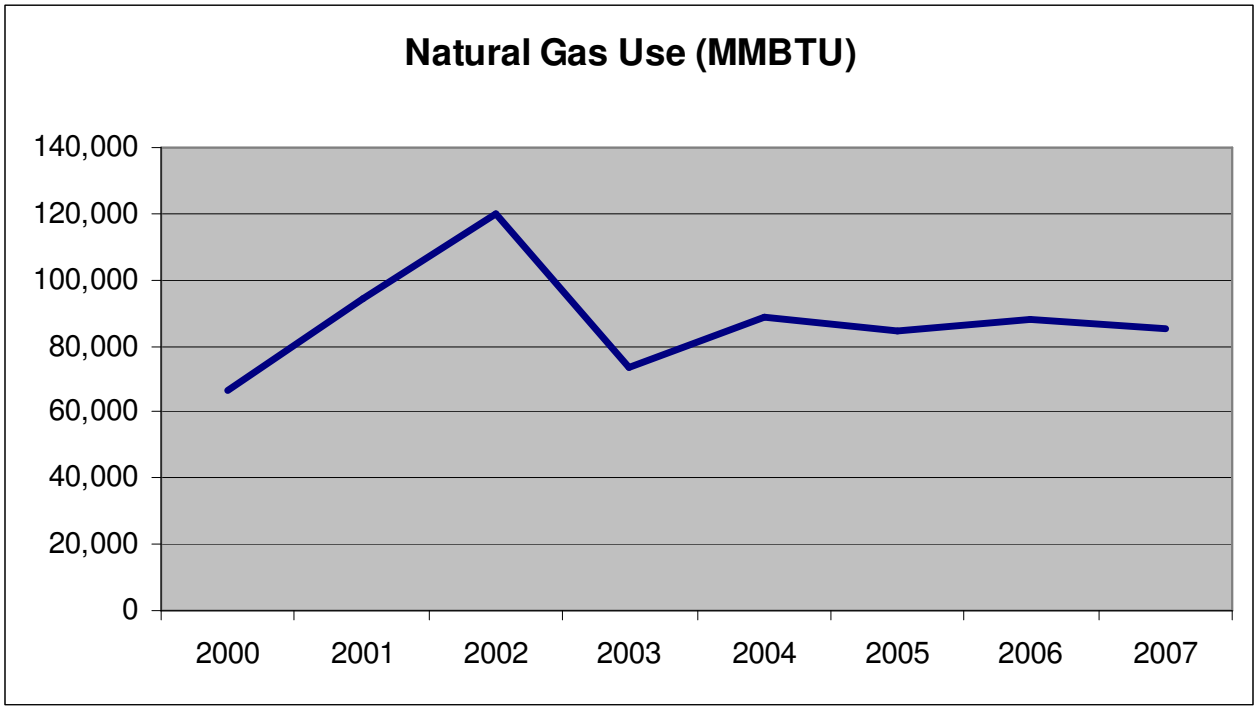
Actively explore vehicle fleet efficiency. What can we do to increase efficiency? Discuss use of company trucks as commuter vehicles. Consider replacing vehicles at IT, etc.
.
Revise list of pending and completed projects resulting from energy working groups.

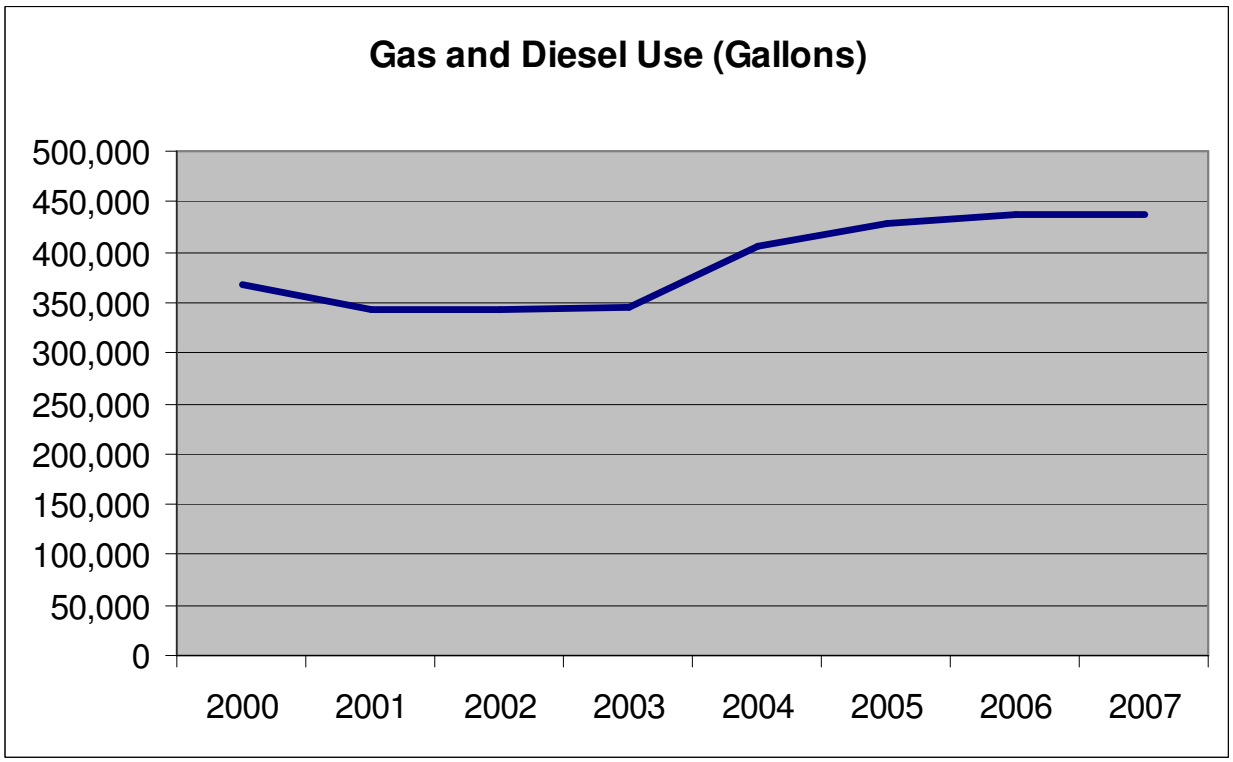
Prepare report on progress towards energy reduction goal and establish new goals to meet or exceed 2015 target.

ASC Energy Use by Category






Natural Gas Use (MMBTU)
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
2000
2001
2002
2003
2004
2005
2006
2007


Gas and Diesel Use (Gallons)
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2000
2001
2002
2003
2004
2005
2006
2007