

# Secretary of State **AUDIT REPORT**

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## Department of Administrative Services: State Agency Energy Conservation 2001



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### Summary

#### PURPOSE

The purpose of this audit was to determine the extent to which state government reduced its use of energy in state-owned facilities in response to the governor's State Energy Conservation Plan that began in January 2001. Under the plan, state agencies were expected to immediately reduce their energy consumption by 10 percent. Our audit reviewed agencies' use of electricity and natural gas in state-owned facilities during the period January 2001 through June 2001.

#### RESULTS IN BRIEF

All agencies reviewed responded to the governor's plan by implementing energy conservation measures. From January 2001 through June 2001, these agencies reduced their use of electricity by approximately 7.7 percent (17,509,757 kilowatt-hours) and their use of natural gas by approximately 2.1 percent (284,331 therms). Many achieved reductions greater than 10 percent, including several of the state's largest agencies. For example, the Department of Administrative Services reduced its use of electricity by approximately 14 percent during the audit period. The Department of Corrections reduced its use of natural gas by approximately 17.9 percent. While almost all agencies cut

their use of electricity, several agencies increased their use of natural gas.

Under the State Sustainability Policy, agency managers are required to monitor building systems for efficiency and review energy consumption patterns. A few of the agencies reviewed had not maintained adequate monthly or daily records of their energy use. This information is of critical importance as agencies work to conserve energy.

We sent a memorandum to each agency that provided more detailed agency results than are included in this audit report.

#### RECOMMENDATION

We recommend that all state agencies comply with state policy and maintain complete energy use records for monitoring the effectiveness of existing conservation practices, as well as providing information to direct future conservation efforts.

#### AGENCY RESPONSE

The agencies included in this audit generally agree with the findings and recommendation. A complete file of agencies' responses to this report is available at the Audits Division.

### Introduction

In January 2001, through the Department of Administrative Services, Governor John Kitzhaber enacted an energy conservation plan for electricity and natural gas. The goal of the plan was to immediately reduce state government's energy use by 10 percent, and promote lasting energy conservation measures throughout the state. The plan was to be in effect through the winter months of 2001, but was extended beyond June 2001. The Department of Administrative Services has followed on with central oversight of state energy use.

### Background

In the closing months of 2000, energy forecasters raised serious concerns about insufficient electricity supplies for Oregon and the West Coast. Low water levels in northwest rivers threatened the region's capacity to generate enough electricity to meet normal demands. There were also concerns within Oregon that the state of California would need power from the Pacific Northwest to prevent its shortages, and natural gas prices could increase dramatically and impact agency budgets.

Governor Kitzhaber responded to these concerns by implementing the State Energy Conservation Plan to help prevent shortages and avoid

sharp increases in state spending for energy. The goal of the January 2001 plan was for state agencies to immediately reduce their electricity and natural gas use by 10 percent. The governor also called on businesses and citizens to conserve energy.

The Department of Administrative Services announced the plan to all state agencies by memorandum. The announcement listed conservation measures that agencies could adopt to reduce their energy use. The measures were aimed at changing longstanding energy use patterns while requiring only small investments in effort and capital. The Department of Administrative Services also encouraged agencies to

implement effective conservation measures not on the list.

State agencies use electricity primarily for lighting and cooling. Natural gas is used almost exclusively for space and water heating.

## Audit Results

All of the agencies in our review responded to the State Energy Conservation Plan by expanding pre-existing conservation measures or enacting new measures. On the whole, state government reduced its use of electricity and natural gas in state-owned facilities in the period January 2001 through June 2001. While the overall reduction was less than 10 percent, many agencies individually achieved reductions of 10 percent or more.

State agencies reduced their use of electricity by approximately 7.7 percent and their use of natural gas by approximately 2.1 percent. Table 1 and Table 3 show these changes. The reductions represent a savings of approximately \$1.1 million for the six-month period.

### Electricity Consumption

State agencies reduced their use of electricity by approximately 7.7 percent, or 17,509,757 kilowatt hours, in the audit period January 2001 through June 2001. (See Table 1.) This reduction represents a savings of approximately \$850,000, or the equivalent amount of electricity used by approximately 2,700 residential customers for the same six-month period. Table 3 summarizes changes in each agency's use of electricity during the audit period.

The state's biggest users of electricity, the Oregon University System (OUS) and the Department of Corrections, achieved substantial reductions that on a percentage basis were less than the state average.

Both agencies operate multiple institutional campuses with full-time services.

University managers said that several factors limited their ability to make large immediate percentage reductions in energy use. Examples given include rising student enrollments and increased operations in older buildings that are not energy efficient. They said that significant reductions in energy use would require capital investments to upgrade buildings and replace

approximately \$230,000, or the equivalent amount of natural gas used by approximately 700 residential customers during the same period. Table 4 summarizes changes in each agency's use of natural gas during the audit period.

Several agencies reduced their use of natural gas by more than 10 percent. Examples include the Oregon Department of Fish and Wildlife (34.9 percent), Department of Administrative Services (35.4 percent), and the Department

**Table 1: Change in Electricity Use by All State Agencies  
January 2001 through June 2001  
Actual Use vs. Expected and Prior Year's Use**

<i>2001</i>	<i>Expected Use<sup>1</sup> (Kilowatt-Hours)</i>	<i>Actual Use (Kilowatt-Hours)</i>	<i>% Actual Use Above or Under Expected Use</i>	<i>% Actual Use Above or Under Use in 2000</i>
January	38,386,887	37,414,532	-2.5%	-2.1%
February	38,029,752	36,572,590	-3.8%	-4.9%
March	37,447,708	34,643,076	-7.5%	-8.0%
April	37,018,175	32,858,685	-11.2%	-8.3%
May	37,691,096	33,977,648	-9.9%	-8.8%
June	37,559,655	33,156,983	-11.7%	-12.4%
<b>Total</b>	<b>226,133,271</b>	<b>208,623,514</b>	<b>-7.7%</b>	<b>-7.4%</b>

<sup>1</sup> Expected Use is a trend estimate, based on both monthly local outdoor temperature and actual use in the period January 1999 through December 2000.

equipment.

Oregon Parks and Recreation Department officials reported that the nature of the services provided limited the agency's ability to reduce electricity use. Officials said that the department's use is directly related to the number of overnight visitors using recreational vehicle hook-ups. We were told that efforts were underway to educate recreational vehicle users about conservation, and to upgrade park facilities with energy-efficient equipment.

### Natural Gas Consumption

State agencies reduced their use of natural gas by approximately 2.1 percent, or 284,331 therms, in the audit period January 2001 through June 2001. (See Table 2.) This reduction represents a saving of

of Corrections (17.9 percent).

Some agencies' use of natural gas increased during the audit period. Examples among the larger agencies include the Department of Human Services (13.9 percent), Oregon Department of Transportation (5.7 percent), and Oregon University System (5.4 percent).

OUS staff members stated that their increased use of natural gas was due to a short-term arrangement between the University of Oregon and the Eugene Water and Electricity Board (EWEB). We were told that, during the period of our review, EWEB asked the University of Oregon to help the utility ensure that there would be no shortage of electricity. The university responded by increasing its use of natural gas to generate electricity with its co-generation

capacity. This reduced the university's demand for electricity from EWEB to help avoid an electricity shortage. There was a substantial but short-term increase in the university's use of natural gas. Compared to previous years, between March 2001 and June 2001 the university used approximately 43 percent more natural gas than normal. The increase was large enough to materially increase the consumption total for all state agencies for the audit period.

**Actions to Conserve Energy**

Most of the agencies reported using a variety of conservation measures long before the State Energy Conservation Plan was begun. For example, most agencies reported that they had previously installed energy efficient lighting ballasts and electrical equipment, and employed energy efficient materials in building remodeling. In addition, several agencies already had switched their space and water heating from electricity to natural gas.

After the plan was begun, many agencies reported that they began or stepped up the following measures:

- Lowered lighting levels by removing indoor and outdoor lamps;
- Turned off unneeded lights;
- Provided employees with information to explain responsibilities in conserving energy;
- Lowered heating settings and raised cooling settings;

- Lowered hot water settings;
- Made better use of window

conservation measures, a few had not maintained complete records of their energy use for the audit period.

**Table 2: Change in Natural Gas Use by All State Agencies  
January 2001 through June 2001  
Actual Use vs. Expected and Prior Year's Use**

<i>2001</i>	<i>Expected Use<sup>1</sup> (Therms)</i>	<i>Actual Use (Therms)</i>	<i>% Actual Use Above or Under Expected Use</i>	<i>% Actual Use Above or Under Use in 2000</i>
January	3,051,610	3,049,704	-0.1%	-6.5%
February	2,912,261	2,575,083	-11.6%	-3.8%
March	2,369,552	2,414,885	1.9%	-26.3%
April	2,242,288	2,202,465	-1.8%	11.8%
May	1,519,911	1,666,322	9.6%	3.2%
June	1,379,175	1,282,006	-7.0%	18.9%
<b>Total</b>	<b>13,474,797</b>	<b>13,190,466</b>	<b>-2.1%</b>	<b>-5.0%</b>

<sup>1</sup> Expected Use is a trend estimate, based on both monthly local outdoor temperature and actual use in the period January 1999 through December 2000.

blinds to increase or reduce solar heating; and

- Limited or stopped the use of individual electrical appliances.

It is apparent that these measures, among others, were effective in helping agencies achieve immediate reductions in their use of electricity and natural gas.

Several agencies reported establishing energy conservation committees and energy management programs that address future capital improvements. Examples of planned improvements include installing more efficient motors and continuing with improvements in building insulation and efficiency.

**Information Needed for Monitoring Performance**

Although all of the agencies reviewed had implemented energy

Typically, these agencies had not kept or organized monthly or daily data from their electricity and natural gas meters. Under the State Sustainability Policy, agency managers are required to monitor building systems for efficiency and review energy consumption patterns. The policy also mandates a number of other measures impacting energy use in state facilities. Tracking energy use is of critical importance in effectively monitoring and controlling energy consumption.

**Recommendation**

**We recommend** that all state agencies comply with state policy and maintain complete energy use records for directing conservation efforts and monitoring the results.

<b>Table 3: Change in Electricity Use by Individual Agencies January 2001 through June 2001 Actual Use vs. Expected Use and Portion of State Total</b>				
<i>Agency</i>	<i>Expected Use<sup>1</sup> (Kilowatt-Hours)</i>	<i>Actual Use (Kilowatt-Hours)</i>	<i>% Actual Use Above or Under Expected Use</i>	<i>Actual Use as % of Total Used by State Agencies</i>
Oregon University System	106,366,719	100,198,956	-5.8%	48.0%
Department of Corrections	25,766,061	23,897,909	-7.3%	11.5%
Dept. of Administrative Services	23,421,539	20,148,036	-14.0%	9.7%
Department of Transportation	19,969,875	18,000,049	-9.9%	8.6%
Department of Fish and Wildlife	9,110,943	8,134,818	-10.7%	3.9%
Military -Air National Guard	7,657,639	7,648,302	-0.1%	3.7%
Military -Army National Guard	8,964,450	7,313,561	-18.4%	3.5%
Oregon Youth Authority	4,857,028	4,664,702	-4.0%	2.2%
Parks and Recreation Department	4,320,426	4,461,256	3.3%	2.1%
Department of Human Services	4,064,929	3,788,503	-6.8%	1.8%
Legislative Administration	2,077,989	1,848,648	-11.0%	0.9%
Department of Veterans' Affairs	1,536,925	1,371,580	-10.8%	0.7%
Department of Forestry	1,472,394	1,366,653	-7.2%	0.7%
Fair and Exposition Center	1,406,462	1,191,866	-15.3%	0.6%
Education Department	1,192,869	1,157,710	-2.9%	0.6%
Oregon State Lottery	1,139,928	934,600	-18.0%	0.4%
Employment Department	769,704	658,994	-14.4%	0.3%
Liquor Control Commission	669,652	610,711	-8.8%	0.3%
Division of State Lands	578,755	518,427	-11.6%	0.2%
Public Employees Retirement Sys.	494,210	478,800	-3.1%	0.2%
Judicial Department	294,774	229,434	-22.2%	0.1%
<b>Totals</b>	<b>226,133,271</b>	<b>208,623,514</b>	<b>-7.7%</b>	<b>100.0%</b>

<sup>1</sup> Expected Use is a trend estimate, based on both monthly local outdoor temperature and actual use in the period January 1999 through December 2000.

<b>Table 4: Change in Natural Gas Use by Individual Agencies January 2001 through June 2001 Actual Use vs. Expected Use and Portion of State Total</b>				
<i>Agency</i>	<i>Expected Use<sup>1</sup> (Therms)</i>	<i>Actual Use (Therms)</i>	<i>% Actual Use Above or Under Expected Use</i>	<i>Actual Use as % of Total Used by State Agencies</i>
Oregon University System	7,399,087	7,795,110	5.4%	59.1%
Department of Corrections	3,019,015	2,478,463	-17.9%	18.8%
Department of Human Services	586,551	668,147	13.9%	5.1%
Military —Army National Guard	577,852	478,520	-17.2%	3.6%
Military —Air National Guard	405,877	456,323	12.4%	3.5%
Oregon Youth Authority	407,403	376,153	-7.7%	2.9%
Department of Transportation	306,597	324,136	5.7%	2.5%
Education Department	215,364	195,758	-9.1%	1.5%
Dept. of Administrative Services	270,555	174,772	-35.4%	1.3%
Department of Veterans' Affairs	86,640	76,155	-12.1%	0.6%
Liquor Control Commission	53,180	47,039	-11.5%	0.4%
Fair and Exposition Center	35,302	36,135	2.4%	0.3%
Department of Fish and Wildlife	37,052	24,103	-34.9%	0.2%
Oregon State Lottery	25,888	19,718	-23.8%	0.1%
Employment Department	17,197	16,802	-2.3%	0.1%
Department of Forestry	17,070	15,270	-10.5%	0.1%
Division of State Lands	13,739	7,304	-46.8%	0.1%
Public Employees Retirement Sys.	428	560	30.9%	0.004%
Legislative Administration	-	-	-	-
Judicial Department	-	-	-	-
Parks and Recreation Department	-	-	-	-
<b>Total</b>	<b>13,474,797</b>	<b>13,190,466</b>	<b>-2.1%</b>	<b>100.0%</b>

<sup>1</sup> Expected Use is a trend estimate, based on both monthly local outdoor temperature and actual use in the period January 1999 through December 2000.

## Objectives, Scope and Methodology

The objective of this audit was to determine the extent to which state government reduced its use of electricity and natural gas in response to the governor's State Energy Conservation Plan that began in January 2001. Our audit reviewed state agencies' use of electricity and natural gas in state-owned facilities for the period January 2001 through June 2001. We included electricity and natural gas in our review because the state plan was aimed at reducing consumption of both energy sources.

We included only agencies with authority to own their facilities. All leased facilities were excluded from this review (including those at agencies with authority to own facilities). We did so to focus the audit on facilities that were under the control of state agency staff, and for which complete energy consumption data should be readily available.

For each agency, we compared actual monthly use in the period January through June 2001 to actual monthly use for January through June 2000. Because this method did not take into account the impact of local outdoor air temperature on energy use, we also compared use

during January through June 2001 with a monthly estimate of expected use. We derived the expected values statistically, using average local monthly temperatures and actual monthly use for the period January 1999 through June 2001. The percentage results reported in this audit are based on our comparison of actual use to the expected use figure.

At several agencies we directly gathered data from utility company invoices for each electricity and natural gas utility meter. However, for the state's largest agencies, it was not practical for us to do so. Large agencies, such as the Department of Transportation, are responsible for hundreds of utility meters, and

original utility records are located in offices throughout the state. We relied on these agencies to supply us with paper and electronic copies of, or access to, their monthly energy use data. To verify the information, we obtained copies of original utility bills for randomly selected months.

For most utility meters tested, the information was sufficiently complete and reliable for the purposes of our audit. For some

meters, the usage data was substantially incomplete (i.e., several months were missing). We excluded these meters from our review. In some cases, the usage data for a utility meter was nearly complete, but an occasional month was missing. We chose to include these meters in our review. To do so, we estimated the expected values (kilowatt-hours or therms) for the missing months. Estimates were

derived statistically using average local monthly temperatures and actual monthly usage for the meter in the period January 1999 through June 2001.

We conducted this audit according to generally accepted government auditing standards.

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*The courtesies and cooperation extended by the officials and staff of each agency and institution included in this report were commendable and much appreciated.*

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