

## Winter Energy Saving Action Plan 2017 of the University of Tsukuba

Since 2015, our university has worked out summer / winter energy saving actions, implemented energy saving initiatives and strived to reduce the use of electricity. The “Action Plan for Reducing Global Warming Gases in the University of Tsukuba” was determined on March 24, 2016 by the Board of Directors, as to reduce the emission of global warming gases. From this fiscal year, according to the “Regulation for Management of Energy in the University of Tsukuba” set on March 23, 2017 as Regulation No. 16, we are setting the framework for the whole university to reduce the use of electricity and emission of global warming gases and move forward in this area.

There is a recent request for cooperation from the attached “Energy Saving Initiative in Winter (Request)” (MEXT Act for Enforcement No. 239 of 2017) of October 30, 2017 from the Ministry of Education, Culture, Sports, Science and Technology and there is a need to take the lead and handle this common challenge for the community in the University of Tsukuba.

For the control of the quantity of energy used and quantity of electricity used, which is an energy saving initiative in winter in our university from here onwards, the plan concerning the control measures of the quantity of energy used and quantity of electricity used in winter (winter energy saving and electricity saving action plan) for AY 2017 is set as stated below.

### I Basic Principles

The basic principles of this winter energy saving plan are set to be implemented without causing negative impacts on education, research, medical activities and others. This plan aims to ensure a healthy and safe environment for the students and staff in the University of Tsukuba.

### II Time Period

From December 1, 2017 until March 31, 2018

### III Target Facilities

This plan targets all university facilities excluding staff residence.

### IV Goal

The goal is to reduce the use of electricity and gas (used for air conditioning) by 1.6 % than the precedent fiscal year. Attachment 1 shows a breakdown of goals for each campuses.

<sup>1</sup> The electricity bill includes basic fee and usage fee.

1. Goal for reduction of use of electricity:

By following the Energy Saving Action Plan, cut down by 1.6% than the precedent fiscal year. (Total electricity use: down 598,000 kWh / 4 months. Total electricity bill<sup>1</sup>: down 9,496,000 yen / 4 months)

2. Goal for reduction of use of gas for air conditioning:

By following the Energy Saving Action Plan, cut down by 1.6% than the precedent fiscal year. (Total gas use: down 65,000 m<sup>3</sup> / 4 months. Total utility fee: 3,641,000 yen / 4 months)

## V Action Plan in Detail

Here is the list of actions:

### 1. Action Plan for the University Headquarters

- (1) Update the real time data on TEMS (Univ. of Tsukuba Electricity Monitoring System, <http://tems.tsukuba.ac.jp>) to provide information of electricity usage on Tsukuba Campus.
- (2) Promote awareness of energy saving measures by university website, email and posters (see Attachment 2).
- (3) Inspect the electricity reduction actions of each departments and provide feedback. Also, inform the users about turning lights off when not in use and the appropriate temperature for air conditioning. Try to make students gather at certain rooms instead of them staying at many different rooms of the university.
- (4) Expand energy saving awareness by implementing initiatives for energy saving promotion activities by students, increasing energy saving awareness of students, and renewing energy saving awareness of faculty members and employees.
- (5) Reduce utility charges by trying to turn off air conditioners from 12:00 to 14:00 in the afternoon according to the room air temperature when using air conditioners.
- (6) Inform the departments each month on the amount of electricity used.
- (7) When renovating the facilities, switch to LED lights and effective air conditioners.
- (8) Open a webpage for gathering proposals on energy reduction from students and staffs. Hold a meeting to discuss on those proposals, and adopt good ones for the next Action Plan.
- (9) Consider the campuses' energy and electricity reduction actions as a research field for the university's research and education.
- (10) Conduct research on new and alternative energy; contribute to reduction of emission of global warming gases and energy and electricity use. Make feedback to the society with these new energy techniques.

### 2. Action Plan for the Departments

- (1) Each department will act according to the action plan indicated on Attachment 3 for the reduction of electricity and gas use. Confirm TEMS each day and gas bill each month, to know the department's progress with the action plan.
- (2) In addition, each department needs to report each month to their Faculty Meeting on the total amount of emitted global warming gases and energy usage.
- (3) Faculty should encourage students to reduce electricity use.
- (4) Turn off lights during lunchtime and after hours; turn off unnecessary office equipment.
- (5) The following is the examples of actions for the reduction of energy.

#### (Air conditioning)

- Use air conditioners only where the room is being used.
- Try to turn off air conditioners from 12:00 to 14:00 in the afternoon according to the room air temperature when using air conditioners.
- In laboratories where air conditioners need to operate for the whole day, turn down the thermostat, where possible.

#### (Lighting)

- Turn off or dim lights near the windows and during lunch break. After hours use lighting only where necessary for work and safety reasons, and turn off any other unnecessary lights.

#### (Educational and research equipment)

- Adjust the operating schedule of large experimental equipment with the division in charge

of the energy, for usage of energy.

- When there is a school-wide event, try to stop the use of facilities or equipment unrelated to the event, where possible.

(Others)

- Turn down the thermostat of the toilet seat heater and hot water and enforce to keep toilet lids closed after use.
- Stop using air towels.
- Lock the doors of rooms that won't be in use for a long time.
- Ask the vendors to make the automatic vending machines operate in eco-mode.

### 3. Action Plan for Each Students and Staffs

- (1) Confirm the real-time TEMS information on internal website, if you are on Tsukuba Campus.
- (2) The following is the examples of actions for the reduction of energy.

(Lighting)

- Turn off lights in unused lecture rooms, etc.
- Turn off any unnecessary lighting. Before hours and during lunch break use lighting only where necessary for work, and use desk lights if necessary.

(Air conditioning)

- Set the room heater at 19°C. Use fans and circulators to send cool air evenly. · Use blinds and curtains and ensure measures including not leaving doors open for the room heater to become effective when the air conditioner is on.

(Office equipment)

- Set PC, printers, copying machines etc. on energy saving mode and reduce the number of equipment in use. Turn off the main switch on TV etc. as to reduce standby electricity.
- Set the refrigerators and electric pots on energy saving mode and reduce the number of equipment in use.

(Educational and research equipment)

- Reduce the number of equipment that use electricity for the whole day (deep freezers, thermostatic chambers, chemical kept refrigerators).
- Consider renewing outdated equipment that use much energy.
- Avoid the use of large experimental equipment on weekday evenings.
- Try to use the equipment that need to operate for certain period, over the weekend, if possible.

(Work outfit)

- Wear "Warm-Biz" (polo shirts, short-sleeve shirts with "no tie and no Jacket").

(Others)

- Refrain from using elevators. Use Staircases for "two-up three-down".

### VI Verification

- In Tsukuba campus, real-time energy usage is widely confirmable on TEMS webpage. The university headquarters notify students and staffs to look at TEMS daily and promote electricity-saving awareness. Analyze the TEMS data to verify the progress of actions.
- Interview students and staffs on energy and electricity saving.

- Hold committee on collecting ideas on energy and electricity saving, and reflect the ideas on the next Action Plan.

## **VII When the electricity use reach near the contract limit**

When the peak electricity use reach near the contract limit, follow the actions listed below, in addition to all of the actions above listed.

- Electric pots: No use.
- Lights in the hallway: Turn off (where safety is confirmed)
- Rooms not in use: Lights off (where it doesn't cause work stress)
- Electric airconditioners in lecture rooms and offices: pause
- Self-generating electricity machines in Tsukuba Campus: peak-cut operation

These actions will take place after the Division of Facilities Maintenance has informed the whole university.

## **VIII Enforcement and Follow-up**

- The Environment and Energy Saving Committee will review the plan and will make amendments, if required. The results are reported through on-campus meetings for informing students and staffs.

Campus Energy and Electricity Saving Goals

Names of the facility		Energy Usage (Dec-Mar)		Reduction in Winter (Dec-Mar)		Contracted Power for FY 2017
		Goal in Winter for FY 2017	Record in Summer for FY 2016	Energy Usage	Charge <sup>2</sup>	
Tsukuba Campus (Central)	Electricity	20,848,000	21,187,000	▲339,000 kWh	▲5,322,000 yen	12,700kW
	Gas	1,464,000 m <sup>3</sup>	1,488,000 m <sup>3</sup>	▲24,000 m <sup>3</sup>	▲1,308,000 yen	—
Tsukuba Campus (Medical)	Electricity	11,201,000	11,383,000	▲182,000 kWh	▲2,837,000 yen	7,260kW
	Gas	2,447,000 m <sup>3</sup>	2,487,000 m <sup>3</sup>	▲40,000 m <sup>3</sup>	▲2,189,000 yen	—
Tsukuba Campus (Kasuga)	Electricity	642,700 kWh	653,100 kWh	▲10,400 kWh	▲182,000 yen	449kW
	Gas	59,700 m <sup>3</sup>	60,600 m <sup>3</sup>	▲900 m <sup>3</sup>	▲75,000 yen	—
Tsukuba Campus (Ichinoya)	Electricity	812,200 kWh	825,400 kWh	▲13,200 kWh	▲217,000 yen	526kW
	Gas	—	—	—	—	—
Tsukuba Campus (Hirasuna & Oikoshi)	Electricity	1,286,700	1,307,600	▲20,900 kWh	▲348,000 yen	790kW
	Gas	—	—	—	—	—
Tokyo Campus (Bunkyo Building)	Electricity	649,500 kWh	660,000 kWh	▲10,500 kWh	▲184,000 yen	610kW
	Gas	—	—	—	—	—
Elementary School, Univ. of Tsukuba	Electricity	107,100 Wh	108,900 kWh	▲1,800 kWh	▲37,000 yen	178kW
	Gas	9,010 m <sup>3</sup>	9,150 m <sup>3</sup>	▲140 m <sup>3</sup>	▲11,000 yen	—
Junior & Senior High School at Otsuka	Electricity	145,600 kWh	148,000 kWh	▲2,400 kWh	▲52,000 yen	299kW
	Gas	—	—	—	—	—
Junior & Senior High School at Komaba	Electricity	112,000 kWh	113,800 kWh	▲1,800 kWh	▲35,000 yen	161kW
	Gas	6,170 m <sup>3</sup>	6,270 m <sup>3</sup>	▲100 m <sup>3</sup>	▲10,000 yen	—
Senior High School at Sakado	Electricity	103,100 kWh	104,800 kWh	▲1,700 kWh	▲32,000 yen	117kW
	Gas	10,550 m <sup>3</sup>	10,710 m <sup>3</sup>	▲160 m <sup>3</sup>	▲16,000 yen	—
Special Needs Education School for the Visually Impaired	Electricity	202,600 kWh	205,900 kWh	▲3,300 kWh	▲62,000 yen	258kW
	Gas	—	—	—	—	—
Special Needs Education School for the Deaf	Electricity	179,500 kWh	182,500 kWh	▲3,000 kWh	▲53,000 yen	179kW
	Gas	15,910 m <sup>3</sup>	16,170 m <sup>3</sup>	▲260 m <sup>3</sup>	▲22,000 yen	—
Special Needs Education School for the Mentally Challenged	Electricity	45,400 kWh	46,200 kWh	▲800 kWh	▲16,000 yen	78kW
	Gas	6,930 m <sup>3</sup>	7,040 m <sup>3</sup>	▲110 m <sup>3</sup>	▲10,000 yen	—
Special Needs Education School for the Physically Challenged	Electricity	44,400 kWh	45,200 kWh	▲800 kWh	▲16,000 yen	91kW
	Gas	—	—	—	—	—
Attached Kurihama Special Needs School	Electricity	60,800 kWh	61,800 kWh	▲1,000 kWh	▲22,000 yen	146kW
	Gas	—	—	—	—	—
Shimoda Marine Research Center	Electricity	231,400 kWh	235,200 kWh	▲3,800kWh	▲61,000 yen	114kW
	Gas	—	—	—	—	—
Sugadaira Research Station	Electricity	80,700 kWh	82,000 kWh	▲1,300 kWh	▲20,000 yen	43kW
	Gas	—	—	—	—	—
Total	Electricity	—	—	▲ 597.7 千 kWh	▲9,496,000 yen	—
	Gas	—	—	▲65,340 m <sup>3</sup>	▲3,641,000 yen	—

<sup>2</sup> The electricity bill includes basic fee and usage fee.

# Please Save Winter Energy



## Lighting

- Turn off Lights**
  - Turn off unnecessary lights (e.g. at lunch breaks)
- Reduce**
  - Reduce the number of lights in use
- Energy Management**
  - Use stickers to remind lights off



## Air Conditioning

- Temperature Control**
  - Set the room temperature at 19°C
- Turn Off**
  - Turn off air conditioners when not in use
- Reduce Heat**
  - Use window blinds, curtains etc



## Office Equipment

- Reduce standby power consumption**
  - Set PC and printers in powersave mode
- Turn Off Computer Monitors**
  - Turn off computer monitors when leaving desks
- Plug Off Electric pots**
  - Plug off electric pots when not in use



## Teaching and Research Equipment

- Review the Usage of Laboratory Refrigerators/Freezers**
  - Consolidate and Optimize
- Turn Off Experimental Equipment**
  - Turn off unused equipment whenever possible
- Review usage of 24-hour operation equipment**
  - Review the operation timing and duration



## Work Habits

- Encourage "Warm Biz"**
  - Wear layered clothing and clothes that are made to retain heat
- Usage of Staircases**
  - Use Staircases for "two-up three-down"



## Others

- Restrooms**
  - Set toilet heaters and warm water at low temperature

## Example on Reducing Electricity Bill

Subject		Action	Monthly Electricity Bill Reduced			
Lighting		Turn off during lunch or recess (1 hour)	One room (20m <sup>2</sup> )	▲ 50 yen/ 1 room per month	Large room About 264,000m <sup>2</sup>	▲ 660,000 yen / month
		40W Fluorescent Light, dim one of the lights		▲ 130 yen/ per Light per month (42W×10h×20days×0.015yen/Wh)	100 Lights	▲ 13,000 yen/ month
		32WHf Fluorescent Light, dim one of the lights		▲ 110 yen/ per 1 Light per month (35W×10h×20days×0.015yen/Wh)	100 Lights	▲ 11,000 yen/month
Air Conditioner		Raise set temp by 1°C (Summer) or lower by 1°C (Winter)	Laboratory (20m <sup>2</sup> ) Per room	▲ 90 yen/ per room per month	Laboratory, etc. About 264,000m <sup>2</sup>	▲ 1,188,000 yen/ month
		Turn off individual air conditioners from 12:00 to 14:00	Office (500m <sup>2</sup> ) Per room	▲ 170 yen/ per room per month	Per 20 rooms	▲ 136,000 yen/ month
		Turn off central air conditioners from 12:00 to 14:00	Lecture room (100m <sup>2</sup> ) Per room	▲ 40 yen/ per room per month	Per 100 rooms	▲ 160,000 yen/ month
Office Equipment	PC	Eco-mode	1 Note PC	▲ 80 yen/ per PC per month	4,000 PCs	▲ 320,000 yen/ month
	Copy Machine	Eco-mode	1 Copy Machine	▲ 1,420 yen/ per machine per month	100 Machines	▲ 142,000 yen/ month
	Electric Pot	Reduce number	1 Electric Pot	▲ 800 yen/ per pot per month	50 Pots	▲ 40,000 yen/ month
Others	Toilet	Turn down the thermostat of the toilet seat heater and hot water and keep toilet	1 Toilet Seat	▲ 2300 yen/ per washlet per month	100 Seats	▲ 23,000 yen/ month

## Example of Reducing Gas Bill

Subject		Action	Monthly Gas Bill Reduced			
Air Conditioner Using Gas		1 hour pause per day	Laboratory (20m <sup>2</sup> ) Per room	▲ 100 yen/per room per hour	Laboratory, etc. Per 100 rooms	down 10,000 yen/ month
		If leaving work at the fixed hour, once a week	Academic Service Office (320 m <sup>2</sup> )	▲ 250 yen/hour	Leave work 2 hours early	▲2,000 yen/ per month
Central Air Conditioner		Turn off the central air conditioner from 12:00 to 14:00	Lecture room (100m <sup>2</sup> ) Per room	▲ 90 yen per room per hour	Per 100 rooms	▲ 360,000 yen/ month