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Research Article

ANALYSIS OF ENERGY SAVING TECHNIQUES OF HOME APPLIANCES

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ABSTRACT

The work focuses on the analysis of modern energy-saving home appliances that can save electricity. The main indicators of electricity quality and ways to improve them, the analysis of the energy balance of electricity consumption, the issues of saving electricity and increasing the power factor by improving the operation of electrical equipment and electrotechnological devices were presented. Suggestions and recommendations were also made on energy saving measures in the lighting and power grids.

KEYWORDS

Incandescent lamp, home appliances, refrigerator, lighting system, dishwasher, washing machine, energy saving, energy saving lamps.

INTRODUCTION

The issue of rational use of energy resources has always been on the agenda. This issue is becoming more and more important in today's world of growing demand for energy resources. Today, the rise of energy efficiency to the level of public policy can be seen in the recent decrees, resolutions and a number of regulations adopted in this area [1-3].

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As a logical continuation of such practical work, new energy-saving technologies are being introduced in the technological processes of industrial enterprises, domestic consumers and other types of energy consumption facilities on the basis of world standards. [4-6].

Based on these tasks, the main goal is to strengthen compliance with the rules of transmission, distribution and consumption of electricity generated through the rational use of available resources, as well as state control. It is also important to replace outdated and obsolete electrical technology with modern equipment. Electricity consumption in household work is growing every year, and this tradition is preserved, as in recent years the population has become the main consumer of electricity in homes and rooms, household appliances (washing machines, kitchen harvesters, vacuum cleaners, electric kettles, electric meat grinders, electric coffee makers, etc.). [7,8]. The use of electricity in homes can be divided into four groups:

- Room heating;
- Cooling and freezing;
- Lighting;
- Washing laundry and dishes (using washing machines and dishwashers). The categories listed above may vary from house to house. For example, some houses have electric stoves, others have gas, central heating in one house and electric heating in another to maintain the optimal temperature. Approximate power consumption by various devices is given in Table 1.

Table 1. Approximate power consumption by various devices

№	*INSTRUMENT*	Consumption, kWh / year
1	Incandescent lamp 60 W.	263 (12 hours a day performance)
2	Energy saving lamp 9-11 W.	44 (due to 12 hours of work day and night)
3	Refrigerator	427
4	Lighting system	475
5	Dishwasher	440
6	Electric oven	275
7	Washing machine	584
8	TV set	150
9	Video tape recorder	65
10	Coffee grinder	40
11	Computer	35
12	Iron	30

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Saving energy in the home starts with the room in your home. First of all, it is necessary to heat the existing materials by closing the cracks in the doors and frames; thick curtains should be hung on windows and balcony doors so as not to cover the radiator and impede heat circulation; additional polyethylene film should be placed on the windows; the toilet and kitchen ventilation openings should be half-closed and the smoke vent should be covered with cardboard or thick paper. Most of the heat escapes through the walls and sometimes through the windows. These losses can be minimized by making a reflective screen out of glossy film, aluminum foil or galvanized tin, or cardboard glued to the plywood and placing it behind the radiator. The best way to adjust the temperature in the room is to turn on the faucets and temperature controls on the radiators. Here are some other ways to save energy at home.

1. Turn off the lights where they are not needed, without interfering with the comfort of life, and instill this habit in all family members;
2. If possible, replace incandescent bulbs with energy-saving bulbs that provide 70-80% less energy. At the same time they burn 5-6 times longer;
3. Install lamps of different wattages depending on the amount of light required in some places. It should be noted that when lamps and ceilings become dirty, the illumination of the room decreases by 10-15%;
4. Electrical appliances (television, radio, telephone) intended for remote control should be switched off not only at night, but also during other unused periods (leaving the house, breaks, etc.), as they can be switched on when connected to the mains. consumes energy;
5. Operate the washing machine at full load with the lowest possible temperature. Keep in mind that washing at 90 °C requires 3 times more energy than at 40 °C. Because the detergent dissolves quickly at a temperature of 40 °C and has an active effect on the laundry;
6. Refrigerators and freezers are the most energy consuming in the room. They account for about 40% of the energy used in homes. The following simple principles can reduce power consumption by up to 25%: - Periodically defrost the refrigerator to prevent the formation of 5-10 mm of ice in the refrigerator compartment;

- Place these appliances away from heating elements and out of direct sunlight;
- Leave an open space of at least 1-2 cm around the refrigerator;
- Put only chilled food in the refrigerator and freezer;
- Tight closing of the refrigerator door;
- Keep the refrigerator door open as little as possible;
- Dust the back of the equipment at least once a year;
- Disconnect the refrigerator if the family is away from home for a few days.

The use of gas stoves is an ecologically better option than cooking on electric stoves. If you have an electric stove in your home, you can save energy by:

- Choose a flat outer surface of the pan or pan and a diameter of more than 3 cm above the heating surface of the hob;
- Switch off the hob a few minutes before boiling or frying;
- Use a container with a lid;

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- Pour the optimal amount of water.

Install circuit breakers in areas where lighting is required at short intervals, such as stairwells in apartment buildings and in front of single-room homes. When buying electrical appliances, first of all you should be interested not only in the price, but also in energy-saving parameters, just compare the cost of use with the price and decide on the possibility of purchasing the necessary electrical appliances purposeful. An important point in saving electricity used for residential heating is the reliable heating of balconies, doors, frames of apartments and houses. The simplest and quickest way is to tuck a piece of newspaper-wrapped paper into the window and window openings. This method works best when there are few cracks in the windows and in severe cold. A reliable way to protect windows from the cold is chalk paste and glue made from it. Make these ingredients in a Table 2

Table 2. A reliable way to protect windows from the cold

Diameter of comfort, mm	Diameter of the vessel, mm
145	160, 180
180	180, 200, 220
220	220, 240, 260

It is recommended to use flat-bottomed aluminum, stamped steel, cast iron cookware with a thickness of 5 - 8 mm on cast iron comfort plates.

When using an electric stove, it is necessary to fully follow the rules written in the passport of the stove, which will reduce electricity consumption by 30-40%.

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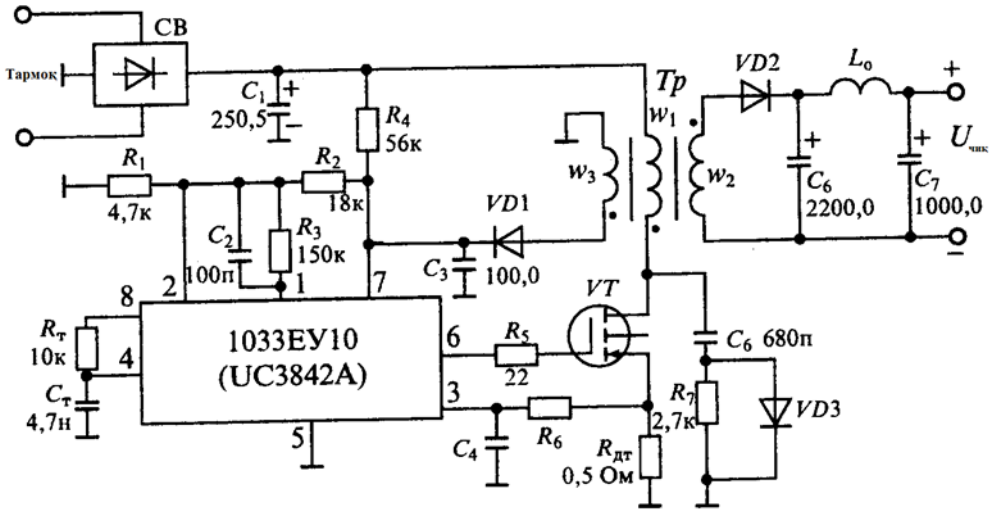

Figure 1. Schematic diagram of power supply of household electrical appliances

Failure to replace faulty consoles with new ones in a timely manner will increase electricity consumption by 3-5%. There is also the use of special electrical appliances for cooking certain types of food, such as electric samovars for making tea, electric grills for cooking chicken and fish, electric kettles for cooking kebabs, and electric ovens for cooking meat or eggs in oil. . The operation of this oven is based on the fact that the high-frequency electromagnetic waves generated in the inductor heat the cooking material in the oven evenly and the process is very fast. For example, it takes only 10 to 12 minutes to boil a piece of ice at -100C, and you don't even have to break the package to boil the milk in a paper bag. In addition, all of their vitamins are preserved when we cook any pastries and stews.

Household items, outerwear, shoes are pollinated during use. Dust settles on the floorboards, between the folds and fabrics of the clothes, and between the hairs of the carpets. Dust consists mainly of particles of cotton, wool, paper and other organic materials and quartz particles of various sizes. Factors affecting the efficiency of photocells. According to the structure of photocells, if the ambient temperature rises, the efficiency of solar panels based on them will decrease. In many cases, a single photocell cannot produce the required amount of electricity, so several of them need to be connected. Such a group of connected elements is called a solar module and is mounted between the glass plates. This collection can be fully automated.

CONCLUSION

Domestic service machines and equipment operate on alternating current with a voltage of 220V and a frequency of 50 Hz. Not all areas of electronics can be imagined without a power source. Industrial electronics, transport electronics, electric power, radio engineering, television, computer engineering and others. Consumer machinery and equipment used in these industries are used in measuring and control devices, control and protection devices, converters, as well as devices that transmit, receive and amplify information.

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