

# Analysis and assessment of environmental savings electric energy

A. A. Ataeva<sup>1,\*</sup>, Kh. S. Muzakaeva<sup>2</sup>, and S. S. Belakaev<sup>1</sup>

<sup>1</sup>Grozny State Oil Technical University named after academician M D Millionshikov, Grozny, Russia

<sup>2</sup>Kadyrov Chechen State University, Grozny, Russia

**Abstract.** The article provides an analytical overview of energy savings by switching to LED lighting. The effectiveness of using LED lighting in terms of fire safety in everyday life and financial savings has been proven. A mathematical calculation of the return on investment when replacing fluorescent lamps with LED lighting is presented. Key words: fluorescent lamps, LED lighting, LED designs, ecology, economics. Rates of world production and consumption of energy resources have been trending downward over the past decade. However, the total the amount of primary energy resources produced in the world continuously increases.

## 1 Introduction

Man was closely connected with the world at all stage of its development. At all stages of his development, man was closely connected with the surrounding world. This is due to the fact that since a highly industrialized world, dangers of human intervention in nature have greatly increased. The area and scale of this intervention has expanded as well as its range was widened, it has become more diverse and now threaten global danger to humanity.

In addition to the problem of environmental pollution, another important problem is the limitation of natural resources and their irrational use.

Rational use of energy resources, incl. electricity, has a huge impact on the strengthening and development of both the state and individual enterprises [2]. When determining the consumption of primary fuel and energy resources needed to produce electricity may be two cases were considered.

In the first, it is possible to determine the consumption of primary organic fuel for electricity generation. Moreover, the higher the share of energy generated at hydroelectric power stations, the lower the specific consumption of consumed organic fuel.

Currently, it is impossible to imagine our modernity without electricity. It's hard to even imagine that light would go out in all the houses on the planet for a day, and then chaos would begin. Every day, it is increasing the cost of electricity in the world. Electricity prices are becoming more high, and its use is constantly increasing. A pressing issue for the whole world is energy save.

For example, you can find alternative methods of energy consumption to help you save money, carefully use natural resources and take care of them.

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\*Corresponding author: [magomedova1204@mail.ru](mailto:magomedova1204@mail.ru)

Lamps that are fluorescent (fixtures) have become popular [3]. This was the reason for their save energy, this is what it was. LED lighting has achieved a new level and has significant advantages: the luminous flux that is several times higher than that of a fluorescent lamp of the same power, as well as an additional advantage: a luminous flux that is several times higher than that of a fluorescent lamp of the same power. LED lighting is more comfortable for vision due to the absence of vibration (flicker), as well as its absence of vibration (flicker). A product's service life: LED will serve you up to 50,000 hours, and the standard of fluorescent lamps is only about 25,000 hours.

## 2 Research Methodology

It is not possible to turn the lighting off and on, as it can reduce its service life. Frequently switching the lighting off and on has a negative impact on the performance of the fluorescent lamp - its service life is reduced. [4]. A second reason for this is the heating temperature of light elements in operation: LED heats up to only 30 and fluorescent lights light up to 60. Why LED designs are the most preferable for fire hazardous facilities? In addition, LED lamps do not contain any substances that are hazardous to the environment or human health. Therefore, it is environmentally cleaner and has no need for special disposal, but this cannot be said about its competitor [5]. It is necessary to leave the room and ventilate with permanganate solution potassium. If such a lamp breaks, it is required to leave the room and ventilate with permanganate solution potassium.

The relevance of this study lies in the need to optimize costs, introduce energy and resource-saving technologies and equipment, and ensure citizens adhere to the principles of economy and frugality in order to ensure the most efficient and rational use of natural and fuel and energy resources.

Research problem: establishing ways to reduce losses of electricity and water resources when used in everyday life. We conducted a social survey of the population on energy saving.

## 3 Results and Discussions

According to the results of a population survey:

-45% - do not know how to save electricity;

-21% - use water excessively, do not know the rules of thrift and energy saving;

-19% - do not know that our Earth is suffering from excessive use of electricity and the climate is changing;

-15% - do not know that everyone can make their own contribution to energy saving.

Coal, oil, and gas satisfy 80% of the world's energy needs, but cause emissions of carbon dioxide and other greenhouse gases into the atmosphere, which warm our planet.

Due to global warming, various disasters are occurring in the environment. Floods, tsunamis, droughts [6]. And it gets worse every year. Over the past 50 years, more than 2 million people have died in the world

How much does it cost to save energy?

The number of appliances consuming electricity in our homes is growing. From electric stoves and washing machines to mobile phone chargers. Electricity is rising in price by about 14.5% per year. And more and more people are starting to think about saving it.

Our article leads to energy savings when lighting by using daylight while possible.

The recommendations for the development of annual and long-term plans for organizational and technical measures for the rational use and saving of electricity in agricultural production are given for the development of annual and long-term plans for

organizational and technical measures for the rational use and saving of electricity. This is the basis of these suggestions: monitoring the use of electric equipment, installations and devices; controlling the use of power, electrical equipment and installations. The rationing in energy costs, reliability to be achieved by electricity, electrical equipment and installations are monitored as well as measures for reducing electricity losses in electrical networks; rational use of electric motors; electrotechnology.

A voltage deviation from the nominal voltage, the relative reduction in power and losses of energy are given for compensating for reactive power.

LED and energy-saving light bulbs are longer than regular light bulbs, they last 8 times longer than a normal light bulb and produce 3 times more light [9].

The home record holder for energy use is the wash machine. This is 18% of the electricity in your house, it consumes 18% of the electricity in the house. According to the following tips, you can reduce your washing machine's appetite by 30%.

We have a refrigerator and in second place we have a refrigerator. Absolutely, you should install the refrigerator correctly: leave it away from heat and warmth devices, as well as allow an area of 5 cm between its back wall with the refrigerator.

At the moment, it is unnecessary for the refrigerator body to be exposed to direct sunlight. During your stay, set a temperature level that suits you and do not put hot food in the refrigerator.

Vacuum cleaner, man's close friend. But without knowing it, we spend a lot of energy cleaning 2-3 hours a week. On average, a regular vacuum cleaner uses 1700-2000 W per week

And the robot vacuum cleaner, working every day, spends: up to 190 W per day, up to 1330 W per week [10].

Saving energy due to the possibility of working with night and day electric metering, you should consider purchasing two-tariff electric meters, which allow you to achieve greater profits much more profitable than the commonly used standard price.

In addition, transferring the economy to an energy-saving path of development is not only reducing costs and cheaper products, but also brings it into production and consuming.

As the cost of consumed energy resources in the cost of production in some sectors of agricultural production is more than 60 percent, and today's prices for energy are high. So it became important to solve the problems of energy save.

In addition, replacing outdated incandescent lamps will help save energy. These are replaced with fluorescent ones; their service life and luminous efficiency are much better, but they should be placed in an area of constantly or frequent light on. The first thing is to install them in such conditions that the light is on regularly or long time.

One such lamp consumes 20 W per hour, on average the lamp burns for 8 hours (in winter) and 5 hours (in summer). There are 65 such light bulbs in the house.

We made calculations by visually replacing the 60(W) light bulbs in our house with energy-saving 20(W) ones.

Result: a 60 W/hour lamp consumes 11,388,000 W per year, a 20 W/hour lamp consumes 3,942,000, i.e. the difference is 3 times. In rubles, this is 24,000 for 60 W lamps, and 8,300 per year for 20 W lamps. Using energy-saving lamps you can save 15,700 rubles per year

## 4 Conclusions

LED lamps have the advantage of not only energy saving, but also ease of use. LED lamps are very easy to control; they can be controlled either from a switch or from a remote control. You can adjust the brightness, set a timer, change colors. LED lamps are 8 times

more efficient than incandescent lamps, energy saving lamps are 5 times more efficient than incandescent lamps.

The luminous flux of an LED lamp can vary from 50 to 110 lm/W, of an energy-saving lamp from 40 to 65 lm/W. The efficiency of an incandescent lamp is only 5-6%. The rest goes into heating the air. An energy-saving light bulb has an efficiency of no more than 70% even under ideal operating conditions. And finally, we note that energy-saving lamps have another important quality that is relevant for consumers who care about their health: the distribution of light in an energy-saving lamp is soft and even, which can significantly reduce eye fatigue, and, as a result, keep vision healthy.

Thus, energy-saving lamps are an excellent choice for a responsible and modern buyer who wants to live and work in comfort, and, at the same time, do not forget about the need to optimize electricity consumption.

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