

DEVELOPMENT OF ENERGY-EFFICIENT TECHNOLOGIES

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This article shows what methods are implemented in energy efficient technologies. To date, invented many new technologies that save energy. And several examples are given in this article.

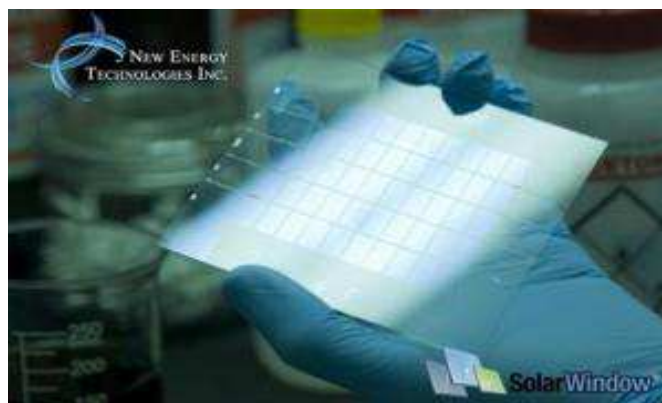
Efficient use of energy and its development remains today one of the main objectives of public policy to enhance the economic potential of the country. Improving energy efficiency and reducing energy consumption in all areas, from production to delivery of public services is becoming a major issue in all relevant countries.

Energy-efficient equipment, materials and technologies have not yet received widespread in Russia. Only those that allow the minimum regulatory requirements for energy efficiency in buildings are widely used. The general picture of the head section Energy Expert Council under the State Duma committee on housing policy and housing, a member of the General Council of "Business Russia" Leonid Juravel [1].

One of their main instruments to stimulate the development of energy efficient technologies in modern Russia became the Presidential Decree of June 4, 2008 889 "On measures to improve the energy and environmental performance of the Russian economy." Measures set out in the decree provided for a reduction of energy consumption by 2020 gross domestic product of Russia no less than 40 percent, compared with baseline. Decree of the Federal Act is supplemented by November 23, 2009 261 -FZ "On energy saving and energy efficiency" , the Federal Law of December 30, 2009 384 -FZ "Technical Regulations on safety of buildings and structures" , the Government of Russian Federation January 25, 2011 18 On approval of rules establishing energy efficiency requirements for buildings and requirements to determine the rules of energy efficiency class apartment buildings containing the requirements of energy efficiency of buildings and should include reduction performance at least one time in five years, from January 2011 at least than 15% relative to baseline , with 1 January 2016 - 30 per cent and from 1 January 2020 - 40 per cent [2].

In different countries, almost every day new developments are announced in the field of energy and energy efficiency technologies. Here are the most extended.

Columbia, MD – January 4, 2011 – New Energy Technologies, Inc. (OTCBB: NENE) it is announced that scientists developing the Company's novel SolarWindow technology are capable of generating electricity on see-thru glass windows and they have achieved an important research breakthrough which could result in the replacement of materials prone to breakdown and degradation. Successful integration of the Company's new discovered compounds could lead to improved efficiency, lower production costs and enhance future commercial manufacturability of SolarWindow [3].



Pic. 1, *Researcher prepares New Energy's SolarWindow model in lab at University of South Florida.*

“Mr. John A. Conklin explained that he had focused on developing electricity-generating coatings which remain transparent and can be applied onto glass surfaces at room-temperature. These goals were successfully achieved by our researchers and publicly was demonstrated last year,” explained Mr. John A. Conklin, President and CEO of New Energy Technologies, Inc. “This year, our sights are set on commercial product development targets, such as power output, efficiency, durability, reliability, cost, and manufacturability” [3].

Researchers are also working towards the replacement of brittle and expensive materials commonly used for generating electricity on SolarWindow with easier to handle, low-cost liquid compounds [3].

New Energy's replacement compounds support one of the most important functions for generating electricity on glass surfaces of SolarWindow, namely, the movement of electrons. This ‘flow’ of electrons (negatively charged particles) is fundamental to generating electric ‘current’, necessary for powering appliances and fixtures.

During ongoing development testing, these new compounds have been shown to successfully ‘mobilize’ the electrons necessary for generating electricity on SolarWindow prototypes. Notably, scientists have produced these solution-based compounds without the use of expensive starting materials, and have discovered methods which allow for high reproducibility [3].

Unlike conventional materials used for generating electricity on organic solar cells, New Energy's liquid compounds, currently under development a scientists, remain see-thru, are easy to handle, and can be applied at room temperature and without the use of high-vacuum. So all important attributes support commercial manufacturing [3].

“Nowadays the announced marks are an important achievement. We accomplish each new milestone during research and development, and prototype fabrication, brings us one step closer to commercialization of our SolarWindow technology,” Mr. Conklin concluded [3].

New Energy's SolarWindow technology — capable of generating electricity on see-thru glass windows — is currently under development for potential application in the estimated 5 million commercial buildings in America (Energy Information Administration) and more than 80 million single detached homes [3].

To date, energy-efficient technologies are used for the construction of modern houses. Although their value can only be a dream ... Also these buildings increase the economic potential of the country.

Solar House is a construction built on the principles of "solar construction" (solar architecture), namely , the maximum possible use of solar energy to meet the needs of the house. More than 500 constructions of this type are built in Germany [4].



Pic. 2, Solar House.

By definition Institute , sunny home must meet the following conditions:

- 1) Good insulation.
- 2) Providing hot water and heating by solar energy at least 50%.
- 3) Additional heating (if necessary) only from renewable sources (wood).
- 4) Extremely low consumption of "primary" energy for heating - no more than 15 kWh / m² a.

The high degree of coating heating needs the sun's energy and is achieved by a large area of solar collectors and storage tank significant amount [4].

Solar Home Heating commonly used "warm floors" or wall heating. In a sunny house, preferably the device and partition walls of the massive heat capacity of materials. Currently, the Institute built not only individual houses and apartment buildings [4].



Pic. 3, Solar House. Apartment buildings.

In Russian experience the technology of solar construction can be used primarily in the southern regions,

as well, with some reservations, in areas with high levels of insolation, for example, Primorsky Region [4].

Many people often use use rainwater for watering their green area. But if we apply the energy-efficient technologies, the rainwater can be used in the household.

In modern energy efficient construction employs many solutions to conserve natural resources. One of these solutions is the use of rainwater, not only for watering the vegetable garden, but also for domestic use [5].

Note that from a purely economic point of view the use of such systems in Russia is hardly justified - water prices for households are low. If in Europe , on the one hand, the payback time systems using rainwater is 10-15 years (water prices over the last twenty years there have grown by more than hydrocarbon fuels), and, on the other hand, environmentally conscious citizens is high, the Russia, the situation differs strongly enough. Therefore, the use of rainwater in the home until we designed more for enthusiasts. In some quite rare, however, cases of use of rainwater can replace traditional systems of water. For example, if there is no water, and the use of traditional methods of autonomous water supply (well, well) is difficult for one reason or another. The disadvantage of the use and the risk of rain water in this case is obvious - instability and poor predictability of rainfall, respectively, the volumes of water that can be used [5].

Rainwater utilization system is quite simple. Water is collected from the roof and goes through the pre-filter in a special container, which is typically the amount of 2000 - 3000 liters. These storage tanks are made of composite materials or concrete. Fully stocked tank volume of 3000 liters can provide a family of four for 18 days (with a daily consumption of 160 liters).



Рис. 4. House using rainwater.

The tank for the accumulation of rainwater can be mounted inside the perimeter of the house (say, in new construction), or outside. It is desirable to design a system prior to construction - in this case, pre- built into the project entry point communications, allow to carry out installation more correctly and without prejudice to the building's energy efficiency. However, the system using the rainwater can be successfully mounted and if already constructed house. From the tank water is directed into the supply network at home using a submersible electric pump - rainwater utilization in everyday life. Here it is necessary to consider the following important conditions [5].

Theoretically, rainwater can be directed to the water supply network at home through a purification

system.

Of course, if you are not connected to the central water. If the water in your home is autonomous, and if you do not drink the tap water (use of rainwater for drinking and cooking is not recommended) to this there are no obstacles [5].

Traditional European solution is to install a separate (parallel) pipeline network, when rainwater is directed for specific purposes of consumption: a toilet, washing machine, washing machines ... [5]

The world is changing, and we change with them! Development of energy-efficient technologies has already received widespread acceptance and adoption in the developed world and is now becoming a hot topic in Russia. Increasing consumer awareness of modern energy solutions - one of the priorities of YIT in Russia. In residential construction under the Energy Efficiency understand complex economically sound measures aimed at reducing energy consumption buildings [6].

The use of energy efficient technologies in the global attitude to provide not only allows saving of resources and their rational use, but also a positive influence on the ecology of the environment [6].

Thus energy-efficient technologies do not only improve the lives of people, but also contribute to the country's economic potential. To date, there are no obstacles that could hamper the development of energy efficient technologies. Many commercial projects are announced nowadays that can help the development of our country!

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