Technical And Economic Analysis Of Old And New Architecture In Energy Costs

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ABSTRACT

Properties of materials used in building design and features a large effect, in its response to climate factors surrounding the building. Solar energy absorption or penetration of the building depends on air temperature, surface temperature, horizontal, etc. to these features. Collecting, preparing and analyzing this information requires a lot of extra effort. It should not be overlooked when designing a building. Different methods of recording information, and remove the incompatible parts of Perth and the lack of homogeneous data, this task can be difficult. Unfortunately, the lack of recorded weather data, can be a limiting factor for building energy design.

Key words: Architecture, Design, Renewable Energy, Losses

Introduction

Although the building design, only to surface weather data needs. (Mainly data on temperature, humidity and solar radiation), but the importance of obtaining homogeneous data should not be ignored. Lack of solar radiation data is one of the main problems that need by measuring the climate and their mathematical model, to be resolved. Climate studies in urban and regional scale, the new science and application of climate data in building energy design Is left to develop. Building as an important influence in moderating the climate crisis situations outside and coordinate the transfer and climate has been buildings. Due to heat losses in winter (up to 45 percent, the wall up to 25 percent, 20 percent of the windows, air infiltration up to 20 percent) and heat penetration in summer (up to 45 percent, the wall up to 25 percent, 35 percent of the window, air penetration to 15 percent), the necessity of using architecture based on the use of renewable energy like wind and proved to be a stew. Among other causes are:

A - Desirable for building wind and solar renewable energy. B - A native of wind and solar renewable energy. C - Having the use of wind and solar energy technology. D - Having a large number of areas with favorable conditions. E - The multiple use of wind and solar energy Yt. F - Can be economically competitive with fossil fuel energy. G. - Higher efficiency operation. H - Need to reduce development time. I - The need to move toward alternative energy, fossil fuels (oil exporter with regards to the next two decades will not be completed until the oil reaches the next three decades), J - high population growth and the need for more energy demand. K - The national economy relies on oil revenues.

Above objectives in the construction sector following the optimal architecture is the result:

A - Optimization of heat gain in winter. B - Minimize heat gain in summer. C - Design for use of renewable energy. D - Go to the pollution-free and low cost energy.

Interior design solutions based on energy:

If interior design, in violation of energy in buildings. Is desirable and cost effective (both in terms of personal interests. The National Interest). A solution in this regard will be discussed. Maintain that the plan, I will pay attention to energy efficiency in buildings. This strategy include:

Leaf spring setup:

Opening and closing in the open air or space Not warm, open up. Like in the stairwells, warehouses and parking lots causes. Cold air enters the building and a lot of waste heat River. Springs installed that will automatically close in B, can prevent heat loss.

Insulation:

Use insulation to keep heat in the hot house is important. Insulated to retain heat and heat the building largely to help at home, the cost will be paid
30 percent less. This work is best done at the construction stage. The trees around the house and planted ivy on the walls acts as insulation, to prevent loss of heat energy. Carpet and putting down floors under carpet floor also is home warmer.

Insulation that is warmer interior surfaces. Water vapor in the air cannot be converted to liquid.

- In the presence of impervious layers of insulation (aluminum) to stop the steam-cooled surfaces. This is impervious layers in all the ceilings and walls. In areas where average daily temperatures above 5 °C is not required. An insulating. A good job should be a way that prevents heat from inside the prison. Install the aluminum foil under the roof can help prevent intrusion into the heat. Insulator. Working this way, especially for B where they are warm and dry weather is very good.

- Ceiling insulation, heating and cooling energy consumption for buildings between 35 to 45 percent decrease. Insulator. Working Wall Foreign, energy consumption for heating and cooling of buildings can reduce about 15 percent. Insulator. 5% of floor work in the winter can reduce energy consumption. Insulation to a home can be 5 degrees warmer in winter, cooler in summer 10 degrees kept.

Sealing with hot air out of the seam. And holes 20 to 50% of the heat out. Gaps and seams in the sides of a few mm in B is equivalent to a 15 cm hole in the wall that waste heat. Sealant should be used to prevent energy loss. Seals are produced in various forms, are cheap, several times the price. Saving in fuel consumption. This is short-lived seals. After one or two years should be replaced.

In order to investigate the effect of air infiltration in energy consumption in buildings cover gasket four state high, medium, low and no influence can be divided. A sealing gasket includes buildings that are old and not good.

The situation represents a state that is intermediate gasket, sealing the building is moderate. New buildings in the windows and they are good gasket, the gasket will be low. Status showed that without the gasket is ideal for building. There is no way to penetrate the air inside the building. It is better to show the influence of weather on energy consumption is considered. In The case cannot be considered for existing buildings.

The influence of air heating with energy, sealing in the B and windows, installing springs on the B, filled Pores and cracks, blocking skylight Ceiling-mounted air conditioner with automatic valves, valve or cap installed on the chimney, the roof can close the channels as a mechanism. Practical to prevent intrusion into the air and reduce energy used in buildings.

Home Repair:

- Crack and gaps in the walls due to heat loss and energy is wasted. The slots and openings should be filled with plaster. In place. That are directly in contact with open air. Or plaster does not stick well to them, the sealant can be find Sylkyn used. Pores and cracks in the frame B And windows, air channels, covering the floors, around water pipes, gas, sewer, and gas coolers mounted on the wall or window around here. Are likely There is a lot of gaps and openings in them.

Door:

The distance between the B And its framework must be fully gasket. If the following B Earth is so much that is not covered with foam pads, you can temporarily put a thick cloth covering it. With help from the craftsman to fill this gap. Said.

Window:

Interior components is one of the main window. Supplier of window light, heat and beauty is in the building. You can open and close the window to the external environment. Had access. The proper clearance, obtain favorable weather. If the window is not properly constructed and used. Or not in compliance with energy building design views. The window is not in proper position. Main heating and cooling loss in summer and warm in the. 10 to 20 percent of energy is lost through windows. Windows can be used to strip. Foam sealing and, if necessary, can be used two layers of foam tape. The long, thick curtains will largely prevent energy waste. Today, technology development and production of multi-layer coatings could significantly relieve the difficulties of glass application. Dramatic effects on energy consumption is optimized. Of Thermal Energy window that it is more, Is more appropriate. Thermal resistance of the window depends on the following factors:

- A. Type of glass used (glass, plastic, glass and glass with low coefficient of energy issuing smart).
- B. The number of layers of glass in windows (glass single wall, double wall)
- C. Inside the air layer thickness between two glass.
- D. Thermal conductivity or window frame.
- E. And airtight gasket during installation.

Valves and channels:

One of my air conditioner vents F. K is the heat loss. With the valve cover and air channels inside the house and roof with foam or plastic plates, Energy loss can be largely prevented. More heat in the house kept. You should be careful to cover the channel layer can be cooler in the summer of removable decorative elements used. Inner beauty is not to be hurt.
### Valves and pipes:

Sometimes caused cracks in the walls are cold, Are the heat transfer agent. The cost to fix them Is. To prevent such problems can be Pre-Cold Deterioration of Air. Was done,. To preserve the house against the cold. Water pipes should be carefully. Make sure to leave no holes and leaks. Milk. Also check the water. Valves that are leaking, are repaired. Insulate water pipes to prevent freezing. Insulate hot water pipes in winter, to keep the water warm, is more significant.

### Heating:

Heating air removal valves And installation of aluminum foil behind radiators will cause a further heating the heating power. Installing foil behind radiators to reflect heat into the heater is. It The walls are about direct contact with the outside, is very effective. This trick can be used as decorative. The classification of parts of the house and vapors low (high efficiency), the best The fuel consumption is optimized.

### Fireplaces:

As the cooler air comes into the building. Another way of air infiltration into the house, the fireplace chimney. When the fireplace is not used. Gas valve should be closed. Heat the house to be preserved. The energy cost to create, not wasted.

### Valves and pipes:

Sometimes left in the cold wall is created. Heat transfer agent and the cost of removing them Is. To prevent such problems can take action before the colder weather. To preserve the house against the cold. Carefully check the water pipes. Be sure to leave no holes and leaks. Check taps. Valves that are leaking, Repair. Insulate water pipes to prevent freezing. Insulate hot water pipes in winter, to keep the water warm, is more significant.

### The curtain:

Installation is completely folded curtains that completely cover the window. Use curtains with bright colors in all conditions can be very effective indoors. The screen acts as an insulator Have, Reduces the energy transfer rate. It noted that the effect of greenhouse glass is useful in cold seasons and curtains on sunny days it can be prevented.

### Review costs Renewable energy in buildings:

Overall performance for solar hot water generation systems should consider the following: The intensity of solar radiation, Energy required for hot water supply intake structures, Considering the volume of storage tank for hot water supply in cloudy conditions, System efficiency.

All the above will affect the initial investment in solar systems. On According to America's energy DOE, The optimal dimensions of the solar generator systems are chosen such that the thermal plants require about 75% of annual hot water consumption of the building Will bring. Or in other words, the solar system about 9 months of the year, 100 percent, water needs Provide building heating consumption in winter months to help the system operate in the building next to the central facility. Storage tanks to supply hot water solar systems in buildings Cloudy And non- Good weather, about twice the storage tanks and hot water systems, gas generators are considered. Solar hot water systems, productive efficiency, depending on the system and build quality, especially from 40 percent to 80 percent collector Solar vacuum tube technology will change. Collector Vacuum has a very high cost of solar technology and where installed collector area is limited, are used. Solar hot water systems, generator repair and maintenance costs compared to hot water systems now commonly used in residential and office buildings is very low. Usually estimated Economic, are not considered. The economic analysis of solar water heater systems, the parameters such as net present value NPV, The internal efficiency IRR, Or return on investment PBP System that is more common than other parameters, the fuel cost in the region is calculated. Investment return period of solar systems produce hot water, depending on their application status can be very different. On According to national renewable energy laboratory NREL, America Energy Organization DOE Systems, solar hot water generator with period simple return on investment SPB, 4 to 8 years are economically. Given that the solar system lifetime of 15 to 40 years with proper maintenance practices (Average 30 years) are considered.

### Conclusion:

Architects and engineers when designing a building, you must expand your mind to the regional climate, weather data analysis to achieve energy efficient in their work Ross. If interior design, in violation of the energy in the building, and the optimal not cost effective (both in terms of personal interests, both national interests). Can be retained within the scheme, the energy efficiency in buildings according to the following payments. Spring mounted on the doors, insulation, sealing, hot water consumption, household repairs, windows, doors, vents and channels, valves and water pipes, heating, fireplaces, pipes, valves and water curtains. According to America's energy DOE, The optimal dimensions of the solar generator systems are chosen such that the thermal plants require about 75% of
annual hot water consumption can be brought into the building.

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References