

ECOSMART HOUSES: THE NEXT GENERATION FOR A SUSTAINABLE LIVING

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ABSTRACT

Over the past 30 years the biodiversity and the natural environment have suffered a lot, serious climate change has taken place and it has a huge negative impact on our lives and our planet's life. And everything has happened mostly because of the pollution we have created. That's why it's very essential to increase the ecological consciousness worldwide.

This study covers theoretical aspects of eco-friendly houses and how they impact our lives and our environment.

The great changes must start from each of us, by changing our lifestyle from what we eat to what we throw back in nature, by improving our houses, by switching to regenerable energy.

All thing considered, the purpose of this research is to find out how the ecological and smart houses can positively affect our lives physically and financially and why they are considered the next generation for a sustainable living.

Keywords: environment, eco-friendly houses, green, sustainable, recycle.

INTRODUCTION

The way many of us live has a terrible impact on the environment. The most scarring fact that screams about this is The Earth Overshoot Day (the date when humanity's annual demand on nature exceeds what **Earth** can regenerate over the entire year) which in 2019 was established on July 29th which is the Earliest Ever!

The couple of months of staying in quarantine because of Covid-19 shows us that **Earth** lives much better “without us”, our planet it's recovering, so all the human beings have to understand now more than ever and to learn to treat “our home” with respect, to do everything possible to make it a better place to live and to keep it safe and clean.

It's absolutely clear that all of us should wake up and take some action to save our mother Earth. One of the many possible ways for doing this are eco-friendly smart homes, so this is the main subject we decided to speak about in this article.

The eco-friendly smart homes concept becomes the nowadays trend because people finally start slowly realizing that we became far too dependent on fossil fuels and all the other mineral and natural resources but our resources are decrease fast in available quantity.

Therefore, in this study we wanted to search and emphase what we can use, how we can build, how we can make for our houses to become more eco-friendly. This way we analyzed the researches already made on the topic and extracted the main ideas which will help us in contouring a clear perception of how an eco-friendly house should be looking like. Also we attached a list of advices which can be easy adapted at any home.

This study includes two chapters:

- Chapter I - Studies related to the topic:
 - Ecological features of an eco-friendly smart house;
 - Recycled waste products in a house design;
- Chapter II - Recommendations:
 - Advices for a sustainable living and for increasing ecological consciousness

CHAPTER I - Studies related to the topic

During our research we tried to gather as much interesting and useful information as possible in the purpose of creating a clear background for us to have where to start from.

I.1. Ecological features of an eco-friendly smart house

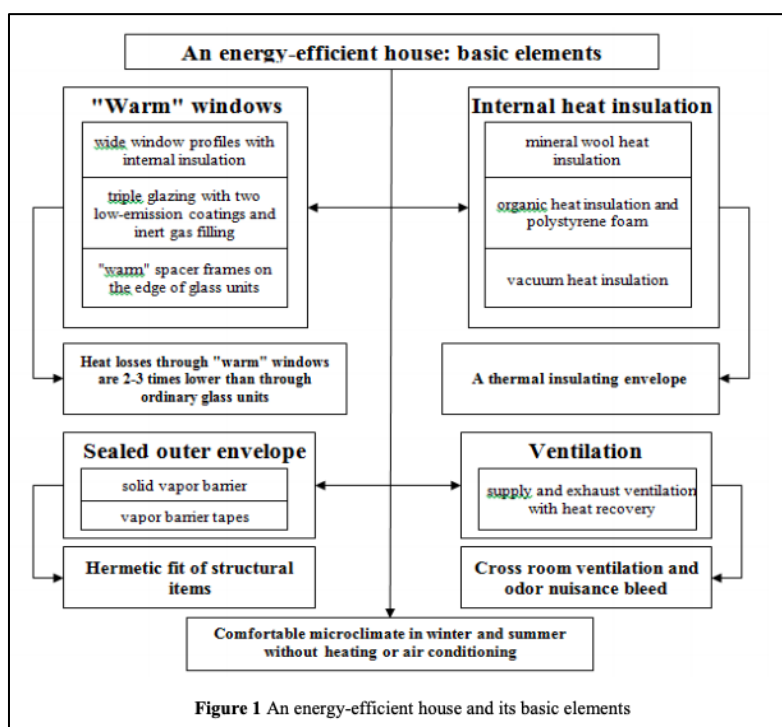
Therefore, for an eco-friendly house we started researching what are the “ecological features” it needs to follow. So far, we’ve found a very interesting publication “Green building: technologies, prospects, investment attractiveness”¹ from an International Journal of Civil Engineering and Technology made by a group of scientists from Russian Federation.

The objective of this article is to define the main features of "ecological properties" of housing and the living environment that form comprehensive perception of eco building as the

¹ Sekerin V. D., Dudin M. N., Gorokhova A. E., Shibanikhin E. A., Balkizov M. H. Green Building: Technologies, Prospects, Investment Attractiveness

socio-economic process and organizational and ecological principles for its successful development.

Nowadays, is required to ecologically monitorize dwellings and urban territories. The system of ecological monitoring for dwelling units based on science references allows controlling all environmental contributors within the urban system. As it is needed to rationally use energy resources due to energy-saving measures, so this becomes the most vital task for eco-house development - to construct an energy-efficient/saving house. Scientists²³⁴⁵ concluded that the most important factor in this this type of house is the actual consumption of comfort and hot water supply energy reduction in a sufficient way, which means eight times less if compared to a traditional house.



In countries such as Sweden, Germany, Switzerland, Denmark and the USA, designers elaborated "energy passive" buildings, with the so-called "zero" heat consumption, where it is not necessary to have a heating system as a continuously operating one within the heating season (Figure 2)⁶⁷.

² Larionov, A.N. & Ivanova, Y.V. [Green Building: Problems and Prospects]. 1, 2009, pp. 57-61.

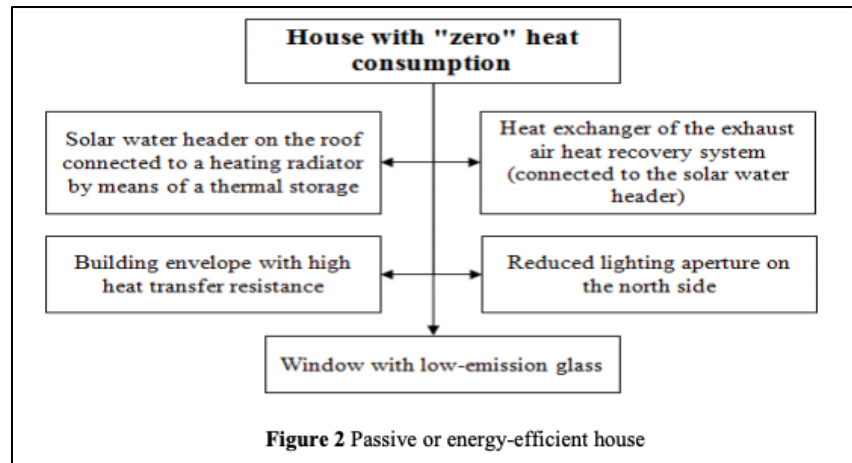
³ Dyachenko, O.S. [An EcoHouse. Energy Saving Technologies in Construction], 5, 2011, pp. 55-60.

⁴ Zilberova, I.Y., Petrov, K.S. & Zilberov, R.D. [Development of Proposals to Improve Energy Efficiency of Apartment Houses of Mass Construction]. Dona, 4 (Part 1)

⁵ Ivanchuk, E.V. [The Question of Improving Energy Efficiency in Dwelling Houses] 4, 2013, pp. 269.

⁶ Agapkin, V.M. & Chernyak, A.V. (Eds.).[Housing: Holistic View]. Moscow: A.V.Ch, 2001, pp. 976.

⁷ Larionov, A.N. & Ivanova, Y.V. [Green Building: Problems and Prospects], 1, 2009, pp. 57-61.



CONCLUSIONS

The study brought up the aspect of technologies developing creating advanced and sustainable construction materials and structures, for new engineering infrastructures which are able to make effective ecologic and economic decisions, which were considered as unachievable before.

The regional peculiarities in the existing energy intensity of buildings, the climatic differentiation of Russian regions, environmental approaches and the regulatory structure stipulate a need in creating an independent model focused on the national priorities and principles of state regulation of green building development.⁸

I.2. Recycled waste products in a house design

For designing an eco-house we can use recycled waste products to make it more sustainable. The case of study “The use of recycled waste products in a sustainable house design” written by Agnes Iringoval, a representant of the Department of Building Constructions and Urban Planning, Faculty of Civil Engineering, University of Zilina, Slovakia, illustrates a couple of good examples and ideas for a sustainable way of using recycled waste products this way making our homes more eco-friendly.

In her study, Agnes constated that the building construction according to the current building standard shows a negative impact on the environment. In terms of sustainable construction, it's essential to optimize the materials and products used in building this way that their environmental burden would be as little as possible, ideally within the category A.

⁸ Sekerin V. D., Dudin M. N., Gorokhova A. E., Shibanikhin E. A., Balkizov M. H. Green Building: Technologies, Prospects, Investment Attractiveness

There are many possibilities of applying recycled waste products in the construction of wood-based sustainable houses, here are some:⁹

- Recycled paper panels
- Recycled wood panels
- Thermal insulations made of recycled paper
- Thermal insulation made of recycled wood

The current study also has a model solution of a house for a medium sized family and the composition of a building envelope made of recycled paper and wood materials.

CONCLUSIONS

It becomes absolutely necessary to use more recycled waste products for the future buildings because the natural resources of raw materials are getting less and less available in quantity every year. Rising the environmental awareness in our society involves that the recycled materials will become one of main sources of input raw materials for the building industry. Waste recovery, both material and energy, will play an important role in waste treatment and management. Waste recycling and the development of waste industry is a significant step not only for the protection of the environment, but also for the sustainable development in the future.¹⁰

CHAPTER II - Recommendations

2.1 Advices for a sustainable living and for increasing ecological consciousness

We are what we eat, but we also are where do we live, what we use to clean our homes, indulge our skin and how we decorate our rooms.

Here are 23 simple ways to have a much sustainable live, starting with small changes, starting anywhere, it feels good because it's the right thing to do and that's catchy.¹¹

1. Clean kindly:

- Use plant-based biodegradable soaps and detergents;
- Use all purpose and surface cleaners that contain plant-based solvents and use ammonia-free glass cleaners;

⁹ Katunský D., Katunská J., Alternative Solutions of Wooden External Walls-Case Study, ABCM Advanced Building Constructions and Materials, (At Lednice, Czech Republic, 2016)

¹⁰ Iringova A. The use of recycled waste products in a sustainable house design

¹¹ Renee Loux, Easy Green Living (2008)

- Throw away cleaners that contain chlorine;
- If the ingredients are not fully disclosed on a product Label (or you can't pronounce them), choose a product you can trust.

2. Be wise with laundry:

- Wash full loads to get the most out of water and energy use;
- Rinse laundry with cold water to save 85 to 90% of the energy use that goes to the water heating for clothes washing;
- Use a line dryer instead of a drying machine, it saves energy, money and extends the clothes life.

3. Choose natural personal care products and cosmetics:

- Choose soaps and body washes that are plant-based and free of synthetic fragrances and colors. They're naturally biodegradable which is better for you and the planet;
- Use face and body moisturizers made with pure plant-based and botanical ingredients to keep your skin hydrated and healthy without chemicals and synthetic preservatives
- Go for naturally effective deodorants and duck away from deodorants that contain aluminum and other chemicals

4. Go for recycled, naturally bleached toilet paper, paper towels and tissues.

5. Install a water filter:

- Drink clean safe water without all the waste. Bottled water might be cleaner but boy does it produce a mountain of waste and golly, is it expensive, the demand for recycling is very high, the rate of recycling water bottles in 2017 in 23% in U.S and 29.1 % in EU, the result is that 40 million bottles every day are thrown in with the rubbish, installing the water filter simply makes a lot of sense.¹²

7. Get a low flow toilet or make your existing toilet low flow:

- About a third of water used at home is flushed down the toilet. The older standard toilet swallow 14,25 to 26,5 liters per flush, while the low flow toilets send away as little as 6 liters of water per flush;

8. Kick off your shoes:

¹² [Plastics: Material-Specific Data | Facts and Figures about Materials, Waste and Recycling](#)

- Removing your shoes at the door is not just a pleasant custom it also prevents you from tracking a host of unwanted things like pesticides and herbicides into your home;
- Get a welcome mat, a doormat outside and an entryway rug inside also help to collect toxins that are tracked in and prevent these substances from migrating throughout the house;

9. Bring in houseplants:

- Houseplants literally grow fresh air by producing clean fresh oxygen and absorbing carbon dioxide and chemicals;

10. Plant a tree every year:

- Trees are much more than the lungs of the planet. They not only remove carbon dioxide from the atmosphere, storing it as cellulose in their woody parts, and generously release oxygen in its place, but also, they regulate the flow and use of water by intercepting rain.

11. Go vegan for at least one day per week:

- A plant-based diet requires a lot less energy and water to produce than a meat-based diet. Meat is the least energy efficient food on the planet, requires a serious amount of water and is major polluter.
- Eating just 1 to 2 kg less meat a year will save as much water as not showering every day for a year.

12. Energy efficient light bulbs save energy, money and emissions:

- Lighting sucks up about 20% of the energy used at home which adds up on electricity bills and causes literally tons of carbon dioxide to be spewed into the air by our overburdened power plants;
- Standard incandescent bulbs waste 90% of the energy they draw in creating heat not light;
- Energy efficient light bulbs like compact fluorescent light bulbs and light emitting diodes are producing just as much light as incandescent bulbs but using a fraction of the energy;

13. Turn the thermostat down with 5-7°C:

- During the cold months set the thermostat at 20°C during the day and 18°C at night;
- During the warm months set the air conditioning at 25°C;
- This is helpful to all the houseplants that are busy cleaning and filtering your indoor air most of them like this kind of temperature drop at night and it will save 5-10% on your bills.

14. Set your water heater at 49°C:

- You'll find that 49°C is piping hot! Most water heaters are set to 60°C which is simply a waste. Turning the temperature down just 10° will prevent each and every household from producing about 272 kg of carbon dioxide a year for an electric water heater or 200 kg for a gas water heater.

15. Smarten your fridge and freezer down and make sure the seals are pristine:

- Keep a tight seal on the doors of the fridge and freezer;
- Vacuum the fridge and freezer coils regularly;
- If you don't have a self-defrosting or no-frost freezer, defrost your freezer regularly;

16. Use power strips and unplug appliances:

- Power stripssave energy and money by plugging the electronics into power strips that can be turned off when the components are not in use;
- Look for smart power strips which has advanced it circuitry that senses the flow of electricity and automatically shuts off components that are consuming idle current;

17. Choose green residential energy service options if you can afford that:

- Utility companies across a lots of countries offer renewable energy options that generate electricity with wind, solar, biomass and geothermal sources;

18. Buy local:

- Buying locally grown food means fewer fossil fuels are used to track it to you. Buying locally grown food is a simple way to change that equation for the better, to support the local producers and get the most for your money;

- The bottom line is that local food is fresher, tastes better and saves energy everybody wins;

19. Go organic:

- Buying and eating organically grown food is one of the single most powerful green choices;

20. Take a cloth bag or basket to the store:

- Just one less grocery bag per person would prevent more than 2 millions of waste and save a lot of money in disposal costs;

21. Inflate your car's tires to their proper pressure to save gas / fuels and money:

- Tires lose pressure naturally over time like a balloon, so check the air pressure regularly;
- Properly inflated car tires can improve gas mileage by more than 3% and extend the life of the tires;

22. Get a travel mug / cup:

- Most paper coffee cups and not only are bleached with devastating chlorine, they are also lined with a thin film of plastic to prevent leakage that has a significant impact on the waste stream and uses enough petroleum to heat more than 8000 houses;

23. Recycle your cell phone:

- According to the Washington Post the 128 million Americans have cell phones have great when you want an average of every 18 months many recycling programs will take your old cell phones
- In the U.S. and Europe, the life cycle of a smartphone has been steadily increasing, according to data from market research firm Kantar Worldpanel. In 2018 smartphone owners used their phone for approximative 25 months.¹³

¹³ [Smartphone users are waiting longer before upgrading — here's why](#)

CONCLUSIONS

Of course there are new technologies that can easily make our homes eco and smart, that can help them reducing energy consumption, that create energy from sun or wind, but we understand that not everyone can afford them and also that simply it's easier to do it the classic way, as everybody is already used to - we don't say you should do all of this, but do at least what is achievable and suits you but also makes your living more sustainable.

The key to a sustainable living lays in every of us and it depends only on us if we choose to take it and open the door to a beautiful green future next to our mother Earth, otherwise we keep it locked and slowly die in our own pollution, due to the lack of resources, fresh air, nature.

It might seem hard, but we need to take it step by step and together we will make a change. If you don't know where to start from, pick up some of our advices from above, pick two or three, start with less and go to more day by day, make them a habit and slowly you will do them as a usual, normal thing.

Be different, be more conscious, start making your home eco-friendly today!

BIBLIOGRAPHY

1. (PDF) Green Building: Technologies, prospects, investment attractiveness//International Journal of Civil Engineering and Technology (IJCET) 2018. Volume 9, Issue 1, pp. 657–666. Available at: <https://www.researchgate.net/publication/323250202>
2. The use of recycled waste products in a sustainable house design - a case study. Available at: https://www.mateconferences.org/articles/mateconf/pdf/2018/55/mateconf_rsp2018_04051.pdf
3. Earth Overshoot Day 2019 is July 29th, the earliest ever. Available at: <https://www.footprintnetwork.org/2019/06/26/press-release-june-2019-earth-overshoot-day/>
4. Renee Loux, Easy Green Living: The Ultimate Guide to Simple, Eco-Friendly Choices for You and Your Home, **Publisher:** Rodale Books; First Edition edition (April 1, 2008, **ISBN-10:** 1594867925. Available at: https://books.google.md/books/about/Easy_Green_Living.html?id=pqHCCQAAQBAJ&redir_esc=y