

Sustainable Interior Design for Homes

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Abstract

Objectives: The study analyzes the interior design in the dimension of sustainability, especially for homes, while shedding the light on the obstacles that influence it and establishing some recommendations. **Methods/Statistical Analysis:** The study used the analytical approach. It analyzed the interior design different elements, then demonstrated how sustainability can be achieved under these element in a successful way. It validated its work frame through using many examples from current practices and works in the field. **Findings:** Sustainable design is a way of thinking that considers the impact of various issues on the environment and on human welfare. Interior design is an integral part of any building construction or renovation and choices made in designing the inner space have environmental and human welfare implications. Thus, the practice of interior design is also considered in the context of sustainability, being a key aspect of any green building process. Building's interiors are fitted with materials, products and systems, while the occupants of those spaces use energy and other resources in ways that are driven, at least in part, by the design of the space itself. Good sustainable interior design must be informed by all these interconnections and impacts, where interior designers help to mitigate these impacts through a certain process that involves themselves, integrated design, clients and rating systems. In addition, many practices work currently to develop different sustainable items and ideas for the interior spaces for our homes, however there are three main obstacles; costs, materials and education. **Application/Improvements:** Raising the awareness about the importance of sustainability in interior design should start in the universities passing by the governments and ending with the clients.

Keywords: Elements of Sustainable Interior Design, Homes Interior Design, Interior Design, Sustainable Materials, Sustainability

1. Introduction

Interior design must not be viewed as a separate discipline, but has to be an integral part of the comprehensive design process of a building¹. Since nowadays, buildings are designed to adapt the problems facing the natural environment and to consider the human welfare, so, interior design shall be no exception². Conventionally, the practice of interior design aims at creating spaces in harmony with the building's systems and fulfils the clients' needs. Choices made by interior designers should result in functional and desirable interior spaces. However, they also have their environmental and human health effects that can extend far beyond the interior space and into the neighborhood. And to moderate these effects,

and in answer to the world's needs, sustainable interior design aroused. It requires that designers expand their traditional thinking that focus only on the users and their needs, to include their health and the welfare of the natural environment¹.

This means that interior designers must start to address issues relating to users' health and welfare, as well as the effect of their design choices on the environment. Issues such as; enhanced day lighting, sustainability of the materials, thermal comfort and good indoor air quality. This does not mean that sustainable interior design has to look or feel different, actually it can look and feel equivalent or even better than a conventional design. This notion will demonstrate to prospective clients the potentials of the design as being a good design¹. Interior design

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is a wide sector, thus, this research will focus on Interior design for homes and residential buildings only, especially in the selection of the case studies and the strategies offered.

2. Key Factors to a Successful Design

There are three main factors that can affect the success of any interior design, and an additional fourth when aiming for sustainability. They are Interior Designers, Comprehensive Design Process, Clients, and Rating Systems for sustainability

2.1 Interior Designers

Interior designers, especially for residential spaces, help their clients in achieving their dreams and having the home they desire. They develop a close relationship, with their client, that makes the exchange of ideas easier, and transfer them smoothly to the rest of the team. This relation can also affect the design's environmental impact¹. So, they first must understand what a sustainable interior design is; its meaning, components, applications and availability in local markets, in order for the design to achieve its goals and the clients to appreciate its value². In other words, they must be aware of interior architectural finishes, lighting, millwork, cabinetry, plumbing, and the entire interior design details; the conventional ones and their sustainable alternatives. This awareness must not only include the main furniture but also the artwork and accessories, to create interior spaces that are aesthetically attractive and functionally and environmentally successful³.

In residential buildings, even a bathroom renovation, can be re modelled in a sustainable way. What is needed is a good research made by the interior designers on the key issues. They can find many sources that will guide them in topics such as how to provide the best indoor air quality and how to select environmentally friendly items and materials and so on⁴. Finally, interior designers must have the motive to go sustainable, be ready to learn and get encouraged by all parties involved for doing so.

2.2 Collaboration and Integrated Design

Another key factor to a successful interior design is the collaboration between all the team members responsible

for designing a building, from its early stage, in a comprehensive and integrated process to achieve their goals. This collaboration facilitates the exchange of views while respecting the role of the experts of each field on a team. In addition, it can benefit the environmental goals, since one solution can be valuable to more than one expert. For example, storing rain water for reuse can benefit both the landscaper and interior designer. The first can use it for the landscape irrigation, while the second can use it as flushing water in the bath. In residential buildings, members of the team may include; Client or Homeowner, Architect, Interior designer, Landscape architect, Engineers, Contractor or Construction Manager, and Subcontractors¹.

2.3 Clients

Clients are one of the most important key factors to any design success, if not the most important. The interior designs must satisfy their needs and work according to their determined budget. If clients do not cooperate and approve to have sustainable designs, it will never take place. Thus, the value, the importance and the need for such designs must be introduced to them carefully, to appreciate its potentials in spite of the increased initial costs. Another important side is the client's feedback after implementation of the design. Its importance comes since sustainable interior design is a new approach and so are its strategies. So, these feedbacks can provide an insight to which strategies worked best and which succeeded less. And be used to improve the sustainable design process and to avoid doing any mistakes in the future¹.

2.4 Rating Systems

As in all the sustainable approaches, there are rating systems created to evaluate interior design success. For residential buildings, there is LEED for homes, it has many categories. It is not basically for interior design however, the water efficiency part covers the indoor appliances while the Energy and Atmosphere covers the heating and cooling systems. Also, the materials and resources could cover the internal finishing materials, and the indoor environmental quality is used for reducing air pollution⁴. In general, there is always the fear that using a rating system can make the designer focus on some points that look easier to achieve more than on the points that will lead to creating a better building⁴. And at such an early stage in

this approach, it could be better not to lead the designers in what is sustainable for interior design, but only to guide and offer ideas.

3. Interior Design Elements

Designing an interior space as previously mentioned includes many elements; the finishing, the furnishing, the equipment's and systems, etc. All these items and products will be categorized in this research under three main categories; Material & Resources, Equipment & Systems, and Creative Solutions. Beneath each category there are different elements and many strategies that are used to minimize the interior design impacts on the environment and humans and also meet the client's goals¹.

3.1 Material and Resources

From sustainability point of view, materials must enhance indoor environmental quality by preventing pollution, decrease the load on raw materials and energy consumption, and eliminate wastes. That is of course in addition to being functional, durable, and desirable and thus satisfying the client's needs. Therefore, interior designer must know the new and available sustainable materials and methods in the local and international markets. The different goals of sustainable interior design can be achieved through using refurbished, recycled, upcycled, local, renewable or certified materials.

3.1.1 Refurbished Materials

Refurbished materials are materials that are saved from demolished or renovated buildings. They can be used as they are or after conducting some maintenance without substantial alteration in their original form⁵. When a house is renovated much can be salvaged from the shell to the interior architectural elements. From the shell walls, floors and ceilings can be saved, as for the interior architectural elements doors, cabinets and millwork are also salvageable. Refurbished items can be used in old, renovated or even new house. For example, salvaged decorative elements are great items to use creatively in new homes; such as terra cotta details, cast iron railings, rainwater gargoyles and hand-hewn beams. Other salvageable materials are appliances and plumbing and lighting fixtures, if they are in good working condition, and meet with the current water and energy consumption efficiency standards. In many countries nowadays,

there are growing thriving markets for saving and reselling used building materials. Local companies, stores, and/or exchange venues on the Internet for both nonprofit and for-profit sake are found. And the interior designer's role is to evaluate existing refurbished materials' condition, quality and style to determine the feasibility of reusing them, in order to create the desired look for the client¹. Figures 1⁶, 1⁷, 2⁸, and 2⁹ will illustrate different ideas for reusing refurbished materials.



Figure 1. (a) Refurbished Table before and after⁶.

Source: <http://www.diyinspired.com/refurbished-garage-sale-night-stands/>



(b) A discarded tea cart was reused as a bar cart⁷.

Source: <http://www.hometalk.com/3993473/furniture-upcycle-tea-cart-diy>

3.1.2 Upcycled and Recycled Materials

Upcycling is the taking a refurbished or waste material and turning it from its current state into something new with different use. For example, and as illustrated in Figure 3¹⁰, instead of throwing glass bottles, they were transformed into light fixture for interior spaces use¹⁰. Another example is the Upcycle House by Lendager Arkitekter, shown in Figure 4. It used wood chips, taken from various production sites that would probably go to waste, as flooring and wall covering¹¹⁻¹². While the Echo House in Philippines, shown in Figure 5¹³, used different refurbished materials to create new objects with new functions. It used cans as lighting units and tires to create plant pot. Another great example for upcycling is the

Vancouver B.C. kitchen, shown in Figure 6. The upper cabinets are made from old wooden lockers found in a warehouse. While the pendant lights are made from discarded flower pots¹⁴.



Figure 3. Using glasses as lighting fixtures instead of throwing them¹⁰.

Source: <http://revamptgoods.com/whats-the-difference-between-upcycling-and-recycling/>



Figure 4. The Upcycle House by Lendager Arkitekter, Nyborg, Denmark.^{11,12}

Source: <http://webecoist.momtastic.com/2014/07/21/10-most-creative-buildings-made-from-salvaged-wood/>



Figure 5. Different recycled materials, Cebu, Philippines¹³.

Source: <https://www.youtube.com/watch?v=y5NDSgOA5PM> by: Researcher



Figure 6. The Vancouver, B.C., kitchen and pendant lights¹⁴. Source: <https://www.houselogic.com/photos/remodeling-tips-advice/salvaged-building-materials-ideas/slide/the-upcycled-kitchen/>

As for Recycling; it is breaking down or destroying the old product by taking it back to its original form and creating a new one. Recycling prolongs the life of materials instead of throwing them away¹⁰, which decrease the new material environmental impact. And reduce the use of raw materials while sustaining them for future generations. Using recycled materials also minimize the underlying energy costs related to the extraction, transportation and processing of new or virgin materials. Materials contain recycled content are ceiling tile, steel, countertops, wall-board, flooring, carpet, and tile¹. For example 60% of Fabric Mate Company's recore backing content, used in the panels, are post-consumer. While many of its fabrics used for the panels are 100% post-consumer content. The panels are illustrated in Figure 7¹⁵.

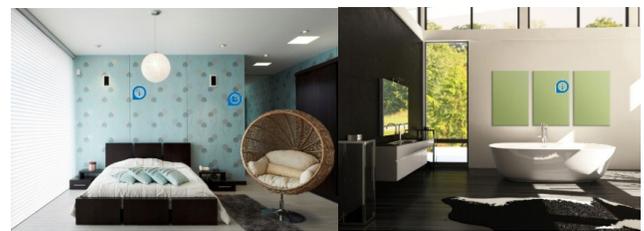


Figure 7. Decorative panels used in bedrooms and baths with recycling contents¹⁵.

Source: <http://fabricmate.com/residential-applications>

3.1.3 Renewable Materials

Renewable materials are materials that can be replaced, through natural processes, in less than 10 years. Using them is environmentally preferable to using non-renewable materials because it means the sustainability of the resources for future generations, in addition to minimizing the effect over the natural ecosystem. Materials that are considered rapidly renewable are bamboo, cotton and

hemp furnishings, cork or linoleum flooring, wool carpet and upholstery, and wheat straw cabinetry¹. Figure 8 illustrates the use of bamboo in the interiors' of homes¹⁶.



Figure 8. A house using bamboo in its construction and interior items¹⁶.

Source: <https://www.youtube.com/watch?v=6vVvxJdQSEs>
by: Researcher

3.1.4 Certified Materials

Certified materials are materials that usually a third party advocated that they are what they claim to be¹⁷. Whether, their claim is to be green, sustainable, using specified recycled content, and so on. There are many environmental certifications in the interior design industry in order to meet with different environmental criteria. Some eco Certifications are; The Forest Stewardship Council (FSC), Sustainable Textile Standard, Green Spec Directory, The Global Organic Textile Standard, The Global Ecolabelling Network (GEN), Scientific Certification Systems (SCS), The Global Ecolabelling Network (GEN), and Green guard Environmental Institute (GEI). Not all of them are equal or assess the same elements, thus, it is crucial for interior designers to understand how companies specify their standards and what exactly these certifications are validating. This knowledge will create the required awareness between designers for which certifications are best to use. For example, Life Cycle Assessment (LCA) is a technique used in some certifications but not all. It evaluates the potential environmental impacts for any product starting from its manufacturing, through its use, and till its end of life².

Also, the Environmental Preference Method (EPM) is a great guide for interior designers when selecting materials or finishes. The EPM can be used for most materials. It categorizes materials relative to their environmental impact, according to the following criteria; raw material availability, ecological damage from extraction, energy consumption including transport, water consumption, environmental pollution including waste, human health and well-being, and repair, reuse, recycle².

3.1.5 Local Materials

Using materials that are manufactured or harvested locally, decrease embodied energy of transportation and reduces energy costs. They also decrease the associated pollution to their manufacture process. In addition, using certain local adhesives, paints and sealants can make a big difference to the indoor environmental quality of a house. Local materials could be new, refurbished, upcycled, recycled, renewable or even certified depending on materials availability and interior designers choices¹. Figure 9 shows the use of eco-friendly products in homes¹⁸.



Figure 9. Honda Smart Home US with Local eco-friendly products¹⁸.

Source: https://www.youtube.com/watch?v=O8Sq_dodtoA
by: Researcher

3.2 Equipment and System

Our homes are filled with equipment and systems that are selected by interior designers and their clients. They are chosen to be functional, provide for the user's com-

fort, and allow a sense of aesthetics to the space as well. However, also all of them should work toward achieving sustainable issues such as; energy and water conservation, wastes reduction, and an indoor enhanced air quality.

3.2.1 Energy Conservation

Residential buildings are one of the main consumers of energy resources. Of course, strategies used by architects to conserve energy lead to a successful sustainable interior design. But still interior designers have their role. If they worked with clients toward a different approach to lighting, it can reduce the estimated energy consumption from lights only by up to 50%. In addition, it can minimize the cooling costs by decreasing heat coming from light fixtures. This can be achieved by using a computerized lighting model to test different scenarios, in order to obtain an energy-efficient, high quality lighting scheme for the designed spaces. Furthermore, balancing light levels to be high or low where it is only needed, according to the required tasks, creates flexible, energy-efficient lighting design. While using windows with thermal breaks and smart glazing can make a substantial savings by reducing heating and cooling needs. The glazing will increase natural day lighting, while adding interior light shelves will control the heat gain. For example windows labelled energy star or energy efficient by the National Fenestration Rating Council (NFRC) can be used in homes instead of typical single or double-glazed windows. Moreover, occupancy sensors and dimming controls can be used for additional conservation. Interior designers can also select all used indoor lamps to decrease the amount of light escaping into the outside spaces through windows. Finally, designing a good combination of task and ambient lighting will provide safely balanced lit spaces, eliminate glare and enhance the readability of television screens and computers¹. Figure 10¹⁹ and 11^{18-20,21} shows different methods used by interior designers to decrease energy produced and the need for artificial lighting.



Figure 10. The designer on the left using low energy bulb that can decrease energy from light by 85% while using oversized lamp shed to conceal it and get reflected light. And on the right he is using white colours for windows and walls to further reflect the light into the room depth and decrease the need for artificial lighting¹⁹.

Source: https://www.youtube.com/watch?v=NBhAJZrO_9M by: Researcher



Figure 11. LED lighting is used throughout Honda Smart home in addition, it used Honda's home energy management system (HEMS); it is a system that monitors, controls and optimizes electrical generation and consumption^{18-20,21}.

Source: (Honda Motors) <http://www.gizmag.com/honda-smart-home-energy-producing/31380/> & <http://www.hondasmarthome.com/tagged/hems> by: Researcher

3.2.2 Water Conservation

Water conservation strategies are conducted throughout the building and its landscape. In desert or dry areas, or in countries with seasonal arid periods, a great amount of water is needed to irrigate residential landscaping. A landscape architect can decrease landscape potable water

consumption with varied strategies. With indoor water use, interior designers should strive to use efficient fixtures as required by local or international polices. Using water-efficient plumbing fixtures can substantially decrease the potable water consumption in homes, which simultaneously helps to reduce the load on municipal water sources. It also decreases the use of supply and disposal systems which minimize the need for new infrastructure¹.

For example the Energy Policy Act established a national standard for plumbing fixtures in 1992 where it used 1.6 gallons per flush/gpf for toilets, 1.0 gpf for urinals, 2.5 gallons per minute/gpm for showerheads and 2.5 gpm for faucets. Recent modifications made them more satisfying to use. For Example, dual-flush toilets have now two options; full flush for solid wastes (the standard 1.6 gpf or less) and short/half flush for liquid wastes (only uses 0.8 to 1.1 gpf). Also, wall-mounted and handheld ultra-low-flow showerheads are available with flow rates of 1.5 gpm. These fixtures are used to enhance the quality of the water flow compared to conventional ones, while conserving water as required. In addition, retrofitting 1.0 gpm low-flow faucet aerators for lavatory and 1.5 gpm low-flow faucet aerators for kitchen can reduce water waste without affecting their performance¹. Figure 12 shows examples for low flow shower heads²².



Figure 12. Low Flow Shower Heads²².

Source: <http://www.modernenviro.com/best-low-flow-showerheads-luxurious-water-saving/>

3.2.3 Wastes and Pollution

Many strategies are conducted by urban designers, landscapers and architects to decrease wastes and Pollution. As for Interior designers, they can help eliminating soil pollution by using nontoxic materials and reusing old materials. For example, Mercury, a heavy metal and a persistent organic pollutant (POP), is an essential ingredient in manufacturing some building and interior materials, such as, fluorescent lamp manufacturing and acting as a stabilizer in some plastics¹. So, interior designers must stop using these products. In addition, they can also help to prevent waste through using reclaimed or salvaged fur

niture and recycled or upcycled materials². Also, putting pins in creative ways to facilitate home wastes' recycling is essential.

3.2.4 Indoor Air Quality

The indoor air quality (IAQ) must be a major concern for interior designers since it affects user's health and productivity. IAQ is affected by the content in different finishes and furnishings. The materials contain toxins that pollute the indoor air such as Volatile Organic Compounds (VOCs), Urea-Formaldehyde, Formaldehyde, and certain flame retardants. For example VOCs are emitted from paints, paint strippers, lacquers, building materials, glues, furnishings, adhesives, urea-formaldehyde foam insulation (UFFI), and pressed wood products (hardwood, wall paneling, plywood, particleboard, and fibreboard). Determining products with low or zero VOC content or any other toxins and using the alternative 'Eco-friendly' products, is the first step to improve indoor air quality. For Example and as shown in Figure 13¹⁹⁻²³, there is now a new and growing market for natural and eco paint².

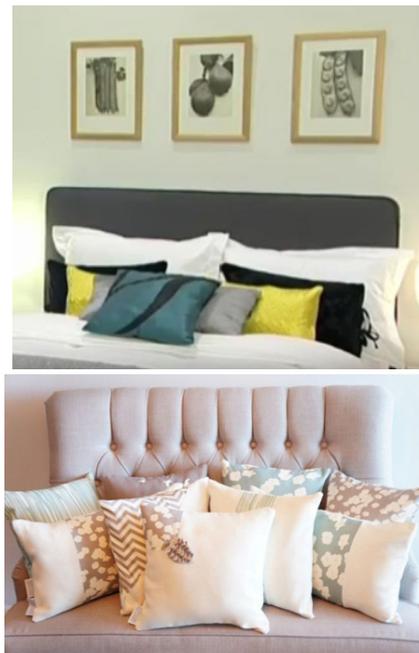


Figure 13. On the left, eco paints for wall decoration from earthborn were used that are free from (VOCs)¹⁹ and on the right cushions were used that are made basically from organic cotton and recycled cotton batting²³.

Source: https://www.youtube.com/watch?v=NBhAJZrO_9M by: Researcher & <http://www.dailypea.com/tips-for-toxic-free-home-decor>

Another toxin is the formaldehyde; it is classified by the American EPA as a potential human carcinogen. Pressed wood products with adhesives containing urea-formaldehyde (UF) resins are the most important indoor sources of it. UF is also found in adhesives in plastics, as a paper coating, as a no-iron additive for textiles and drapes, as paint preservative, particleboard (used as sub-flooring and shelving and in cabinetry and furniture); hardwood plywood paneling (used for decorative wall covering and used in cabinets and furniture), and medium density fibreboard - MDF- (used for drawer fronts, cabinets, and furniture tops). Wheat board is a great alternative to normal plywood for use in countertops and cabinets, laminate surfacing, painting and staining. Also MDI (methyl diisocyanate) does not contain formaldehyde and is used for straw-based particleboards and binding medium-density fibreboard².

3.2.5 Creative Solutions

Creative interior solutions are considered part of the sustainable approach. Although they evolved mainly from functional or aesthetic reasons, however, they work toward achieving environmental issues. As illustrated in Figure 14²⁴, instead of putting a cupboard that requires additional space and materials, the designer used a bed that has its own saving space. Also, he used one screen to act as a TV in the living room then it rotates to act as a computer screen from the other side. This solution saves space and the use of additional products with extra materials.



Figure 14. Eco-Friendly Interior Design with multipurpose products²⁴.

Source: <https://www.youtube.com/watch?v=CEY0sVABJ6Y> by: Researcher

4. Obstacles and Recommendations

Many barriers are facing and affecting the development and implementation of interior design, namely²⁵.

4.1 Costs

Still the high initial cost in some designs is a huge obstacle against the wide implementation of the sustainable concept in the interior design. Environmentally conscious materials and systems needs higher upfront costs, additional money the clients are usually not prepared to pay and so, disregard the sustainable design notion.

4.2 Materials and Products

In some countries there are almost no environmentally conscious products and materials and in others the selection is limited.

4.3 Education and Experience

The sustainable concept is still not well educated in many universities all over the world. And many interior designers have no experience in it or in how to develop one. It is recommended to educate the clients to encourage them to go sustainable in spite of the high initial costs. In addition, the government must implement regulations and policies that encourage manufactures and suppliers to go sustainable and thus decrease the costs and increase the material's availability. Also, an improvement to the interior designers' sustainable design knowledge and the education system in the universities must be conducted. Finally, it is important to encourage the certification of materials because it ensures to the designers and clients that the product they selected is indeed environmentally conscious²⁵.

5. Conclusion

Interior design is an integral part of any building design process especially residential ones. When going sustainable the design of interior spaces can be no exception. All experts involved in the construction and design process are ethically obligated to reduce the environmental impact of their work. Three factors can affect the sustainable interior design; they are the interior designer himself, the clients and the rating systems. As for the elements of the sustainable design; they are the materials, the equipment and systems and creative solutions. These three elements can create a successful interior design that can out-stand the conventional one. However there are some obstacles facing it; and they are clients that refuse the higher initial costs, the limited materials and products, and the lack of

good education in universities and experience for interior designers. Overcoming these obstacles, interior designers can create designs that contribute to human and ecosystem health, enhance the building's function and satisfy users' needs.

6. References

- Childs K, Argeles C, Henderson H, Horst S, Malin N. Beyond Interior Design - Interior Design and Global Impacts 2007. American Society of Interior Designers United States of America, 2007. Available on: https://www.asid.org/sites/default/files/IDandGI_Beyond_Interior_Design.pdf. Date accessed: 03/02/2015.
- Keane O. Sustainable Interior Design. Interiors Association: United States of America. 2012.
- Piotrowski CH. M., Becoming an Interior Designer- A Guide to Careers in Design. Second Edition John Wiley & Sons. New Jersey United States of America, 2009. Available on:
- LEED for Homes Rating System. USGB Council United States of America. 2007. <http://www.hopewelltpw.org/LEED%20Homes.pdf>. Date accessed: 13/06/2016.
- Define refurbished materials. Bold Learning Solutions. United States of America. 2015. <https://www.brainscape.com/flashcards/27148930/-Define-refurbished-materials>. Date accessed: 23/06/2016.
- Wulf D. Refurbished Garage Sale Night Stands. Diy inspired United States of America. 2015.
- Benton H. An Abandoned Tea Cart Gets New Life. Home talk Canada. 2016.
- 8 Home Decorating Ideas on a Budget. Free Home Decorating Ideas. 2014. <http://www.free-home-decorating-ideas.com/8-Home-Decorating-ideas.html>. Date accessed: 21/06/2016.
- Refurbished wood furniture. MSH-Home Interiors Furnitures Ideas. 2016. <http://msh-home.com/refurbished-wood-furniture/>. Date accessed: 21/06/2016.
- Whats the Difference between Upcycling and Recycling. Revamp Goods LLC United States of America. 2014. <http://revampgoods.com/whats-the-difference-between-upcycling-and-recycling/>. Date accessed: 21/06/2016.
- Jewell N. Upcycle House: Lendager Arkitekter Unveils Incredible House Made Entirely from Recycled Materials. Inhabitat weblog New York United States of America. 2013. Available on: <http://inhabitat.com/upcycle-house-lendager-arkitekter-unveils-incredible-house-made-entirely-from-recycled-materials/>. Date accessed: 27/06/2016.
- 10 Most Creative Buildings Made from Salvaged Wood .Webecoist. 2016. Available on: <http://webecoist.momtastic.com/2014/07/21/10-most-creative-buildings-made-from-salvaged-wood/>. Date accessed: 27/06/2016.
- Amazing eco house. Recycled materials Cebu Philippines. Globalvideopro1 United States of America. 2010. Available on: <https://www.youtube.com/watch?v=y5NDSgOA5PM>. Date accessed: 27/07/2015.
- Symons CH. 11 Clever Ways to Use Salvaged Building Materials in Your Home. National Association of Realtors. 2016. Available on: <https://www.houselogic.com/photos/remodeling-tips-advice/salvaged-building-materials-ideas/slide/the-upcycled-kitchen/>. Date accessed: 27/06/2016.
- Bedrooms & Living Spaces. Fabricmate Systems United Kingdom. 2016. <http://fabricmate.com/residential-applications>. Date accessed: 27/06/2016.
- 3 Use Salvaged Building Materials in Your Home. National Association of Realtors. 2016.
- Bedrooms & Living Spaces. Fabricmate Systems United Kingdom. 2016. <http://fabricmate.com/residential-applications>. Date accessed: 27/06/2016.
- Building With Bamboo Why Bamboo Homes Are Eco-Friendly. Bamboo Living Homes: United States of America. 2010. Available on: <https://www.youtube.com/watch?v=6vVvxJdQSEs>. Date accessed: 27/07/2015.
- Green Product Certification. SCS Global Services United States of America. Available on: <https://www.scsglobalservices.com/green-product-certification>. Date accessed: 28/06/2016.
- Sustainable Eco-Friendly Interior Design - Honda Smart Home US. Honda United States of America. 2014. Available on: https://www.youtube.com/watch?v=O8Sq_dodtoA. Date accessed: 27/07/2015.
- How to create a stylish and eco-friendly home interior. Broadcast Exchange : United Kingdom. 2011. Available on: https://www.youtube.com/watch?v=NBhAJZrO_9M. Date accessed: 27/7/2015.
- Lavars N. Energy-producing Honda Smart Home gives more than it takes. GIZMAG PTY LTD: 2014.
- Honda Smart Home. United States of America, 2013. <http://www.hondasmarthome.com/tagged/water>. Date accessed: 22/06/2016.
- Best Low Flow Showerheads Luxurious Water-Savings .Modern Enviro. 2014. Available on: <http://www.modernenviro.com/best-low-flow-showerheads-luxurious-water-saving/>. Date accessed: 22/06/2016.
- Timmer C. Tips for Toxic-Free Home Décor. Daily Pea. 2014.
- Eco-Friendly Interior Design. Roomy Home Interiors. 2009. Available on: <https://www.youtube.com/watch?v=CEY0sVABJ6Y>. Date accessed: 27/07/2015.
- Hankinson M, Breytenbach A. Barriers that impact on the implementation of sustainable design. Faculty of Art, Design and Architecture. University of Johannesburg South Africa. 2013. Available on: http://www.unece.lsu.edu/greenbuilding/documents/2013Mar/gb13_04.pdf. Date accessed: 27/07/2015.