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Green Construction

My topic is about "green construction." Green construction means better building design and better construction materials. Green construction can decrease greenhouse gas emissions and can lower the costs to operate a building. Using solar panels and wind mills.in Green Construction can decrease or even use no fossil fuel electricity. I am interested in this topic because my dad works in construction and I find this very interesting and fun. I was also inspired by how workers use creative ideas to decrease greenhouse gas emission while at the same time; the green architecture gives the same performance as other non-green architecture.

What makes a building green? A green building is a structure that is designed in a ecological manner. Green buildings are designed to improve health and use water, energy and other resources more efficiently and reduce the impact to the environment. What are the economic benefits of green buildings? Green buildings save and lower the operation cost over the life of the building. Green building also improves health, comfort, productivity, and it reduces pollution and landfill waste. Green buildings allow control of air- conditioning and heat and humidity.

How do you make a building energy efficient? To make a building energy efficient, measurements, design strategies, building shape, orientation, passive solar design and the use of natural lighting are needed to replace fossil fuel energy. Installing high efficiency lighting systems with advanced lighting controls is efficient. Motion sensors can save a lot of energy

when light is not needed. Efficient heating and cooling systems with thermally efficient building shells can trap heat in place.

How do you make materials efficient? To make materials efficient, you have to select sustainable construction materials and products by evaluating several characteristics, such as whether they are reused or recycled materials. Other characteristics of materials to pay attention to are gassing of harmful air emissions, toxicity, sustainability of the harvested materials, recyclability, durability, longevity and local production. Recycling materials benefits the economy because it develops a market for recycled materials that can be separated from the California landfills. These strategies can reduce the cost of building materials.

How do you use water efficiently? Efficient use of water can be very easy to do. You can have dual plumbing to use recycled water from toilet flushing. You can have a gray water system that recovers rain water or other non-drinkable water for site irrigation. You can also lower the waste water by using ultra low flushing toilets, modified low flow shower heads but with high pressure outlets and other water conserving systems. You can also use a recirculation system for centralized hot water distribution. The same system can be used to heat up houses without using fuels. Installing motion detection toilets and motion detection faucets can also reduce your water usage in case you forget to turn off the water or or even if you run the water when you're not using it such as when brushing your teeth.

The rainwater H20G tank is a rainwater storage tank that use in against houses, within walls and tight spaces such as under decks. There are two versions of the rainwater H20G tanks. A portable water tank is made from a non food grade tank made with 15% recycled content and from virgin food grade polyethylene. Each of the modules holds about 50 gallons of water that can be used for laundry, toilets, irrigation, gardening and portable water. If the tank is installed within the

building envelope, the tank can use as a thermal storage for solar heating systems. The tanks can be installed vertically or horizontally depending the space that is needed . The tank comes with elbow vents, outlet valves and inlet screens. The rainwater HOG is available as a stand alone tank that is part of a complete rainwater harvest and can be plumbed into the downspout called rainwater Rescue which combines the GLI systems rain tube roof level water collector and the rainwater HOG tank. What makes this product green? This product is considered green because it is pre-consumer recycled content, renewable energy and fuel cells, fixtures and equipment that conserve water and it also reduces pollution or waste from operations.

How does green construction benefit your health and safety? Studies have shown that good overall environmental quality buildings can reduce the rate of respiratory disease, allergies, asthma, and sick building syndrome. Using green materials with no toxic chemicals or harmful chemicals can improve indoor air quality and much more. A healthy building can improve worker performance.

What are some tips for creating high- tech energy- saving solutions? PG&E offers a program to reduce energy lighting for households. This program switches light bulbs into compact fluorescent light bulbs known as CFLs. CFLs use up to seventy-five percent less energy than the traditional lamps and normal light bulbs. Saving that much energy is a good thing for the environment. There is also a down side on using compact fluorescent light bulbs. They cannot be recycled due to the high concentration of mercury in them. After the compact fluorescent light bulb is worn out, it could be dumped in the landfill causing the landfall's toxicity to increase.

What can you do with leftover paint? Paint contains a lot of chemical such as lead if the paint was made before 1978 and paint made before 1991 might contain mercury. These two type of

paint can impact the environment health. You can also donate the paint to a neighbor that might need some extra paint for their patio or house. You can also recycle or dispose the paint at a city dump where they separate the water based, oil based and latex based paint to create a new paint color. Oil based paint is usually used for fuel blending meaning it burns to create energy at a power plant. Oil based paint is always considered hazardous and should be disposed of at a house hold hazardous waste collection.

Benjhamin Moore's Natura line of zero- VOC paints are made for light commercial use and for residential. The paint dries quickly once used and contains little odor compare to non environmental friendly paint. the Benjamin Moores Natura paint contains 100% acrylic resin. In 2009, the company will meet the Master Painter Institutes Green Performance Standard as well as Green Sea;s 2009 GS-11 standard covering chemical content and paint performance. Most of the zero VOC paints uses colorants that contains as much as 150 grams per liter of VOCs while Nautra uses Benjamin Moores own Gennex zero VOC colorants. Benjamin Moores Natura is available as a primer as well as in flat, eggshell, and semi-gloss. What makes this product green? This product is considered green because it releases minimal pollutants into the air. It is less toxic and doesn't affect the human body as much comparing to non environmental friendly paints.

The Sun Cache integral collector storage known as ICS is a solar water heater that uses a roof mounted, copper heat exchanger to pre-heat water for domestic use, water-filled, unpressurized and polyethylene panel. The U.S Department of Energy has developed through research. The relatively inexpensive Sun Cache captures heat about 50 gallons of non-circulating water stored in a rooftop panel. To extract heat from the stored water, the hot-water tap will be turned on while the cold water from the supply line flows through copper heat exchanger embedded in the

panel. The heated water then flows via cross-linked polyethylene tubing, to a tank less water heater or to a conventional storage without pumps. The acrylic glazing minimizes convective heat loss but losses from the collector will still be significant during nighttime. During the afternoon or early evening, people will be using hot water which will be the greatest energy saving time. The Sun Cache is a renewable energy and fuel cells.

A product that produces a diverse and luxurious collection of premium organic textiles that have been produced with careful attention to three critical factors such as toxicity(growing of the fibers and the production of the cloth), carbon footprint and social justice is the O Eco textiles Natural- Fiber Fabrics. The Natural Fiber Fabrics are made from 100% organic cotton, sustainably grown fibers, bamboo, silk, ramie, abaca, hemp and flax. The textiles are produced in living wage environments. The process of making the Natural Fiber Fabric is processes throughout the supply chain eliminating the use of a wide range of hazardous substances typical to the textile industry and produce waste water safe for aquatic life. Many of these fiber fabrics are third party certified to meet the Oeko Tex Standard 100. How this product does considered green? This product is considered green because it releases minimal pollutants. The product also alternative to hazardous component. It is also rapidly renewable and reduces the pollution and waste from operations.

Integrity Block is a cost competitive replacement for concrete masonry units. Integrity Block is a compressed and compacted earth block. The Integrity Block is made from proprietary soil mix that includes preconsumed recycled content up to 60%. Integrity block uses 40% less energy to make. The color of the Integrity Block has a natural earth color without any dyes or pigments. What makes this product green? This product is considered green because it is a preconsumer recycled content. It is naturally or minimally processed. The product also releases

minimal pollutants in the air.

A system that can track real time data on electricity, gas and water consumption is using Agile waves Resource Monitor. The Agile waves can also track; analyze temperature, humidity, air quality, store, output from PV and solar water heating systems, carbon footprint information and utility costs. The agile waves can help reduce water consumption by up to 20%, energy and gas. What makes this product green? This product is considered green because of the equipment that conserves energy and manages loads and it also fixtures and equipment that conserve water.

Another system that can reduce emission is the Matrix total home system from NTI. The Matrix is an integrated appliance that combines heat- recovery ventilator into a single, it is preconfigured for air conditioning, combines a gas fired condensing boiler and furnace, and condensing demand water heater. The Matrix has a heater exchanger tat is capable of decreasing gas consumption by 30% comparing to conventional system that provides an AFUE of 94 for forced air and 92.7 for hedronic heating and an energy factor of 0.85 for water heating. The matrix can deliver around 5 gallons of hot water per minute at 110 degrees F without losing energy and a tank. The Matrix includes a sealed combustion system that draws in outdoor air and directly vents exhaust, a microprocessor that adjusts heat output based on the home environment, electronically commutated motor and variable speed. This product is green because of equipment that conserves energy and manages loads, blocks introduction, development or spread of indoor contaminants.

Built Green is a company that approach to home building and the land they are building on. Build Green develops less drainage problems, uses raw material more carefully, and more engineered uses for less forest destruction per home. Built Green also design the building to keep heating and cooling cost low and help controls interior air quality. Built Green provides services

that can help you with your needs in green construction. Built Green provides emergency board up service, structure cleaning, emergency water extraction including carpets and pads, walls and floors, dehumidification of structure and contents, deodorization and odor neutralization, HVAC cleaning, mold and mildew abutment, smoke residue and soot removal, licensed plumbing and electrical HVAC work, remodeling and total disaster reconstruction.

There are many ways to repair your home for greater energy efficiency. One way is to check if there are any air leaks. Sealing air leaks is an important thing you can do to ensure overall comfort and lower energy bills in your home. There are many areas that can be found with air leaks in your house. Floors, vented areas, staircases or garage walls, holes for wiring, windows, chimneys, bathtubs and attics are some places that have a possibility to have air leaks.

Choosing energy efficient windows can maintain heat inside the house by a special clear coating called “low- e” which reflects heat. Comparing to regular windows, heat escapes causing fog and use of energy. Energy efficient lighting can make a major impact on energy efficiency. Natural attic ventilation can keep attic heat out of your living space. To do this, the first step is to install soffit and ridge vents and gable vents in the attic. the second step is to check if there is any leaky duct work. The third step is to seal gaps in areas where attic spaces meet living spaces.

There are many ways to choose high efficient water heating. Checking energy guide labels and compare operating efficiency on various models. Identify the number of people in your home. Insulate the water heater if it will be located in an unheated space. Provide a thermal break. Set temperature only as high when needed and not over 120 F. Set a timer if hot water will be needed. Landscapes are also another way to save electricity. Trees can provide shades for your home in summer but allow the sun to help warm the house in winter.

Building materials that are considered to be “green’ are expanded polystyrene, which are

renewable plants materials that grow fast, straw, lumber from forests, recycled stone, recycled metal, and other products that are non-toxic, reusable, renewable, and/or recyclable. By having materials that are considered “green”, the houses that are made can reduce up to 60% of the earth’s global emission. However, not all of the people can afford to have green houses because the materials cost a lot. Green houses also creates less waste, protect natural resources, long-term economical savings, and health benefits. Green houses create less waste because they are made with preengineered walls. Green houses protect natural resources because they do not require using tree and avoiding using hazardous materials. Green houses create long-term economical savings because they reduce operational cost, use less energy than a house, and barely needs to be fixed. Lastly, green houses create health benefits, they do not harm people who live in the house because they have cross ventilation, air sealing, air filter, moisture management, and having systems that absorbs CO2 and cleans the air.

Green architecture also reduces waste of energy, water and materials used during construction. During the construction phase, people should think about reducing the material going to landfills. Green houses help reduce the amount of waste generated by the occupants as well, by providing on-site solutions such as compost bins to reduce matter going to landfills. To reduce the damage on wells or water control plants, several options exist. Waste water from dish washing or washing machines can be used for subsurface irrigation, which is a highly-efficient watering technique that reduces outdoor water use by 30 to 40 percent. But if the water is treated, it can be used to flush toilets and wash cars. Centralized waste water treatment systems can be costly and use a lot of energy. An alternative to this process is converting waste and waste water into fertilizer, which avoids these costs and shows other benefits. By collecting human waste at the source and running it to a semi-centralized biogas plant with other biological waste,

liquid fertilizer can be produced. Practices like these provide soil with organic nutrients and remove carbon dioxide from the atmosphere and balance emission. Producing artificial fertilizer is also more costly in energy than this process, because we have to buy more items to create one product, but by taking human waste only it is basically a short and easy process of energy, water and materials used during construction.

A green building may cost more up front, but saves through lower operating costs over the life of the building. The green building approach applies a project life cycle cost analysis for determining the appropriate up-front expenditure. This analytical method calculates costs over the useful life of the asset. To build a green house, they first start by selecting a site well suited to take advantage of mass transit. Next, they have to protect and retain existing landscaping and natural features. Select plants that have low water and pesticide needs, and generate minimum plant trimmings. Use compost and mulches. This will save water and time. Lastly, recycled content paving materials, furnishings, and mulches help close the recycling loop.

After researching green construction, I found out that there are many different ways to conserve energy and to reduce environmental pollution. I learned that there are many different ways to heat up the house without using a heater. I also learned that there are many different ways to conserve electricity. By allowing natural lights to go through the house and using solar panels. I also understand why it is important to save fossil energy, water and the environment.

The person I interview is a construction worker who owns his own construction business for more than 15 years. His name is Rui Xiong Chang who also one of my dad's best friend. He told me a lot about construction being reused. Rui Xiong Chang also told me that the left over wood or material that can not be reused needs to be moved to the city dump and get shipped to the land waste. Rui Xiong Chang told me about different ways to save water and energy. One

way to save energy, you can install censors for turning or turning off the lights every time you go in or out the room. You can also buy censored falsest if you leave the water running or forget to close. Rui Xiong Chang told me that sometimes people throw away their old stove or refrigerator that still works perfectly fine. The stove or refrigerator can be reuse it by bringing it home instead of throwing it away to the city dump. He told me that many old houses still contains lead paint which harms people and the environment. Rui Xiong Chang showed me his work place where a lot of material such as wood, paint, nails, steel and tools are being used during the construction. Everyday the construction workers recycles the wood, steel and paint for tomorrow session or be brought to the city dump to remake the wood. For the paint, they mix the common colors to make new colors and resell it to paint company. The workers uses cloth to cover up the building so dust and other bad chemical wouldn't be in the air we are breathing in and damage the environment. After talking with Rui Xiong Chang, I learned a lot from the interview. He gave me important information about construction and many ideas to put in my research paper. I had a lot of fun learning about construction with him. I appreciate for the time he sacrifice for my interview and I would love to do another interview about construction for my own personal good.

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