

Let's Paint Energy!
An Innovative Idea to Reduce Greenhouse Gasses

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Innovate to Mitigate

Let's paint energy on to buildings! Buildings, houses, and stores are in the daylight from anywhere between one second to twelve hours. Why not use that amount of light and heat for something? Solar panels have been successful with creating energy while not creating greenhouse gases. However the panels take up space in fields, or on the roofs of buildings. If those panels were flat against the walls of buildings, they could still power the building, but without taking up the room.

The idea is to mix graphene, silicon, water-based paint and tiny solar panel "chips" to make a new type of solar panel that can be painted on to buildings. The solar energy and heat will then be conducted through the water-based paint to a graphene/silicon mixture. Graphene is made of thin carbon crushed down. However the process to make graphene could cause even more pollution since large amounts of production of carbon release greenhouse gases.

A mixture of silicon, a highly conductive material and is used in other types of solar panels, and carbon-based graphene would be a conductive mixture that could transfer energy easily without releasing greenhouse gases from its production. The graphene/silicon mixture will then take this energy to a capacitor, which would store the energy used to power the building that is painted. Water-based paint would allow people to paint their buildings whatever color they would like, but still have the energy saving chips and graphene to gather energy. Plus, the water in the paint will help conduct energy. Assistant professor Qiaoqiang Gan at the University of Buffalo is developing his own type of photovoltaic cells; his idea is "photovoltaic cells could one day be applied to surfaces as easily as paint is to walls" ("Paint-on solar panels" para. 1). There are scientists out there trying to make thinner solar panels already, so solar panel paint could be mixed in with their inventions to make a new one.

A wall of energy could be an issue. The wall could turn into a large electric field that could be dangerous to the touch. To prevent those dangers, a thin material would be placed over the paint that would be transparent so sunlight could still pass through to the panels. However, the material would be non-conductive so that people and animals could still touch the walls, but not be hurt by the electricity. This would also protect the buildings in bad weather. Rain and snow would not be an issue in transferring electricity into the streets or on to people who leaned up against the surface.

While painting solar panels may be useful in cities or towns that most houses can be painted, there are other places that houses are built out of materials that do not need to be painted. Houses in South America or Africa are made of different materials like clay or cement, materials that are not painted. Rather than using solar paint in those areas, small solar panels should be mixed into the building materials. Clay bricks or cement could have small panels mixed into them so that it would be the same idea of the paint. They would take energy in and a capacitor would be placed near the house and wires would run to the capacitor, which would then allow people to use the energy for what they need to.

The EPA (Environmental Protection Agency) is keeping track of the emissions of greenhouse gases from different types of energy sources. Oil, one of the most popular energy sources has an “average emissions rates in the United States from oil-fired generation of 1672 lbs/MWh of carbon dioxide, 12 lbs/MWh of sulfur dioxide, and 4 lbs/MWh of nitrogen oxides” (“Air Emissions para. 9). That emission rate is in the United States *alone*. The rate around the *globe* is causing a huge concern. However, solar power based on the EPA “emissions associated with generating electricity from solar technologies are negligible because no fuels are combusted.” Solar power has no ill effect on the amount of greenhouse gases generated.

Solar power has been proven that it is a renewable resource with no repercussions to the environment. Paint with tiny solar panels would have a major impact with reducing greenhouse gases because it would be a new way of implementing solar energy on buildings. Buildings would not have to rely on other sources of energy, like gas or oil (which cause greenhouse gases), they would have an unlimited source of energy that does not add to the amount of gases already. Businesses have already been installing solar panels and have seen a major increase. Buildings in Australia installed solar panels and saw “many buildings can save 20 to 40 per cent on their energy bills” (Lowe para. 2). Solar power can help both economically and environmentally.

Buildings come in all shapes and sizes, and most skyscrapers in cities are some of the largest buildings. If a 40 story tall building was covered in solar paint, there would be thousands of small solar chips capturing energy from the sun. The amount of energy from that would be able to run the building. If every building in a city was covered in this paint, the city could power itself, without the need of oil, natural gas or other nonrenewable sources.

Solar power has been around for decades. The idea needs to be taken another step further, which is solar paint. Tiny solar chips in paint could power thousands of buildings, which would reduce the reliance on nonrenewable resources. With this reduction the amount of greenhouse gases would be reduced dramatically. Grab the brushes, because solar paint is about to be the next big energy source!

Works Cited

- "Air Emissions." *EPA*. Environmental Protection Agency, n.d. Web. 16 Apr. 2015. <<http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html>>.
- Lowe, Ian. "Saving energy and money: Ian Lowe looks at a scheme to encourage the construction of efficient buildings, and answers his mail." *New Scientist* 181.2433 (2004): 47. *Expanded Academic ASAP*. Web. 16 Apr. 2015. <http://go.galegroup.com/ps/i.do?id=GALE%7CA113415755&v=2.1&u=erde79591&it=r&p=EAIM&sw=w&asid=7944c3e541a1c4e2148f8b2739cdb18d>
- "Paint-on solar panels." *Advanced Materials & Processes* 171.7 (2013): 12. *Expanded Academic ASAP*. Web. 16 Apr. 2015. <http://go.galegroup.com/ps/i.do?id=GALE%7CA336942380&v=2.1&u=erde79591&it=r&p=EAIM&sw=w&asid=439a50e2187c1b76d4ffac741f98f440>

Works Consulted

- Estes, Lenora Jane. "Minnesota energy headquarters seeks LEED Platinum." *Building Design & Construction* 1 July 2008: 24. *Expanded Academic ASAP*. Web. 16 Apr. 2015. <http://go.galegroup.com/ps/i.do?id=GALE%7CA181536879&v=2.1&u=erde79591&it=r&p=EAIM&sw=w&asid=91125acb1c87009db41e7c2541e47689>
- "Graphene Solar Panels: Introduction and Market Status." *Graphene-Power*. N.p., n.d. Web. 09 May 2015. <<http://www.graphene-info.com/graphene-solar-panels>>. "Properties of Silicon and Silicon Wafers." *EL-CAT Inc*. N.p., n.d. Web. 09 May 2015. <<http://www.el-cat.com/silicon-properties.htm>>.