

Re: New high end Solar Cell claims 42.8 % efficiency

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Jon Slaughter wrote:

So what are the long term effects? If ~50%? of the solar energy that normally be reflected back out into space is used to create electricity which ultimately will end up as heat, doesn't this mean that global warming will become a reality very quickly?

(snip)

So called global warming is caused by changes in the composition of the atmosphere that slow the escape or infrared radiation into space. Right now, 100% of the radiation that reaches the surface is either bounced back as visible or raises the temperature of the surface. that energy must convect away, or radiate away as long wave IR radiation. Swapping the natural surface for solar cells bounces little back as visible radiation, because the cells are generally pretty dark.

But about half of the radiation that penetrates their surfaces is converted to electrical energy and half raises the temperature of the cells, just like what happens to dirt. The 50% converted to electricity actually lowers the temperature rise of the cells, but that doesn't lower the total IR radiation, because it is just transported elsewhere and radiated away, there.

The net effect with or without solar cells is a wash, except that people get to run appliances off the energy before it leaves into space. If instead, those appliances are run off fossil fuel, their heat is added to what the dirt in sunlight produces, except that the burnt fuel gets added to the atmosphere, getting in the way of the natural and waste heat escaping into space. Either way, solar energy overwhelms any addition from fuel consumption, as far as the amount of heat to be radiated. The big difference is in the composition of the atmosphere that heat has to pass through, to escape.

For the last few decades, we have been pumping several million barrels of oil out of the Earth, every day, and setting fire to it. That is a lot of carbon added to the atmosphere, and carbon dioxide in the atmosphere in the form of carbon dioxide, is very absorbent in the long wave IR part of the spectrum, where all that natural and wast heat is being radiated. As the CO2 builds up it raises the temperature of the atmosphere which raises the equilibrium water vapor content in the atmosphere. Water vapor is another IR absorbing gas, positive feedback takes over at some point and the system swings rapidly to a very much hotter equilibrium temperature, world wide. That is the so called global warming process (originally called global thermal run away, before the oil companies renamed it), in a nut shell.

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