Affordable Green Energy

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COPENHAGEN – Public skepticism about global warming may be growing, but the scientific consensus is as solid as ever: man-made climate change is real, and we ignore it at our peril. But if that issue is settled (and it should be), there is an equally large and important question that remains wide open: what should we do about it?

One prescription that is bandied about with increasing frequency certainly sounds sensible: the world should drastically cut the amount of greenhouse gases that it pumps into the atmosphere each day. Specifically, we are told, the goal should be a 50% reduction in global carbon-dioxide emissions by the middle of the century.

Even its backers concede that achieving this target won't be easy – and they are right. In fact, they are so right that they are wrong. Allow me to explain.

Our dependency on carbon-emitting fuels is more than enormous. It is overwhelming. For all the talk about solar, wind, and other hyped green-energy sources, they make up only 0.6% of global energy consumption. Renewable energy overwhelmingly comes from often-unsustainable burning of wood and biomass by people in the Third World. Fossil fuels account for more than four-fifths of the world's energy diet. So, in order to cut global carbon emissions in half by the middle of the century, we would obviously have to start getting a lot more of our energy from sources that don't emit carbon.

Can we do this? According to the International Energy Agency, here's what it would take to achieve the goal of cutting emissions by 50% between now and mid-century:

- 30 new nuclear plants;
- 17,000 windmills;
- 400 biomass power plants;
- Two hydroelectric facilities the size of China's massive Three Gorges Dam; and
- 42 coal and gas power plants with yet-to-be-developed carbon-capture technology.

Now consider this: this list does not describe what we would have to build between now and 2050, but what we would have to build *each and every year until then!*

One more thing: even if we managed to do all this (which we obviously cannot), the impact on global temperatures would be hardly noticeable by 2050. According to the best-known climate-economic model, this vast undertaking would likely wind up reducing global temperatures by just one-tenth of one degree centigrade (one-fifth of one degree Fahrenheit), while holding back sea-level rises by only one centimeter (less than half an inch).

That's not a lot of bang for the buck. Indeed, the projected costs of this approach – some $5 trillion annually by mid-century – are so much greater than its likely benefits that it makes no sense to call it a solution at all.

Fortunately, there is a better, smarter way to deal with global warming. What if, instead of spending trillions of dollars trying to build an impossible number of power plants – or, more likely, condemning billions of people around the world to continued poverty by trying to make carbon-emitting fuels too expensive to use – we devoted ourselves to making green energy cheaper?

Right now, solar panels are so expensive – about 10 times more than fossil fuels in terms of cost per unit of energy output – that only well-heeled, well-meaning (and, usually, well-subsidized) Westerners can afford to install them. But think where we'd be if we could improve the efficiency of solar cells by a factor of ten – in other words, if we could make them cheaper than fossil fuels. We wouldn't have to force (or subsidize) anyone to stop burning coal and oil. Everyone, including the Chinese and the Indians, would shift to the cheaper and cleaner alternatives – and global emission targets would automatically be met.

Can we achieve this technological miracle over the next 20 to 40 years? In a word, yes. The price of solar energy has been dropping steadily for 30 years – by about 50% every decade – and we could likely accelerate that decline further with sufficiently large investments in research and development.

How large? If we were willing to devote just 0.2% of global GDP (roughly $100 billion a year) to green-energy R&D, I believe that we could bring about game-changing breakthroughs not just for solar power, but also for a wide variety of other alternative-energy technologies.

This belief in the potential of technological progress strikes some climate activists as naïve or even delusional. But is it really? Consider one of the miracles of the modern age – the personal computer. These devices didn't become household items because governments subsidized purchases or forced up the price of typewriters and slide rules.

No, what happened is that, largely as a result of the space race, the United States government poured lots of money into R&D for solid-state physics and electronics engineering. The resulting breakthroughs not only got Neil Armstrong to the moon in 1969, but also made it possible for Apple to introduce the first Mac in 1976 and IBM to debut the first PC five years later.

We can do the same for clean energy. Forget about subsidizing inefficient technologies or making fossil fuels too expensive to use. Instead, let's fund the basic research that will make green energy too cheap and easy to resist.

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oscar 08:42 15 Jul 10

All right. The global temperature will raise 3.00 degrees, or 2.90 if we have luck. That's the message I understood.

One thing about typewriters and slide rules: they do not emit harmful substances.

I like the last paragraph. But I think we can do the two things: penalize fossil fuel (nothing very new: it's already too expensive, at least here in Europe), and at the same time make green energy cheap and irresistible. And... won't the first thing accelerate the second thing?

geemonkb 07:58 16 Jul 10

The biggest hurdle in moving to renewables is aiming for massive scale power plants. We need small , highly economical , highly scalable integrated energy solutions for individual households. I have discussed such an integrated solution in blog

http://geemonkb.blogspot.com/2009/07/sustainable-energy-solutions.html

Summary:

Integrated roof top wind farm(should think of hundreds of very small wind turbines) and solar panels charges a battery(Similar to car battery) through an integrated charging station. The battery should be portable and should be able to put in your car as well.

Explorer 02:37 18 Jul 10

Simpy ban new, replacement and increased coal fired power stations and let the market do its work.

Explorer 02:39 18 Jul 10

The article ignores that over the next 30 years probably 50 to70% of existing coal fired power stations will heve to be replaced anyway, so the focus should be on the incremental, not the total cost.