From the Memphis Business Journal:
https://www.bizjournals.com/memphis/news/2021/09/02/guest-column-ali-agha-going-solar-slowly.html

Guest Column: Going solar is good. Getting there slowly is better.

Sep 2, 2021, 10:37am CDT

The United States has the world's largest economy. We burn massive quantities of fossil fuels — the world's major fuel source for the foreseeable future — and we release a large amount of carbon into the atmosphere. Climate change runs on carbon emissions and is bearing down on us. The good news is that the drive to decarbonize our economy is gaining momentum.

As good as decarbonizing sounds, though, it is by no means an easy task.

A green future is a happy destination coveted by many. How we get there is a subject for debate — a debate that should be guided by scientific truths and accurate accounting of costs and benefits.

Enter solar energy, touted by some as a clean energy source, the cure for carbon emissions, and the easy way out of the climate change/carbon mess. Solar panels produce no direct carbon dioxide emissions, and sunlight is free. Demand for home solar systems is growing, thanks in part to the federal solar tax credits. If you go solar, you are going to get a nice discount on your tax bill, an amount that can be as much as 30% of the cost of your home solar system. What is not to like about clean and cost effective?

Let's take a closer look. Two principles can help us stay grounded as we ponder the path forward.

COURTESY ALI AGHA | THINK CYCLE CONSULTING

Ali Agha, president of Think Cycle Consulting

From physics: Harvesting energy from the environment will inevitably produce waste that will be dumped back into the environment in the process. That's true of fossil fuels, solar, nuclear, and any other form of energy.

From economics: When a doing cost-benefit analysis on any capital investment — as is the case when we go solar — one must examine the cost of ownership, including the cost to purchase, insure, operate, maintain, and, ultimately, dispose of the system at the end of its useful life.

The growing demand for solar is adding to the challenge of having to deal with the mountain of waste it is creating. As solar panels reach the end of 30-year lifetimes, the cumulative mass of end-of-life (EOL) solar panels is projected to reach 50 million tons globally by 2050. Spent solar panels contain valuable materials such as silver, copper, and aluminum, and toxic materials such as lead or cadmium.

The U.S. has no regulations governing solar panel recycling. Today's solar panel recycling processes are not optimized for cost-effective recovery of high-purity materials, or for favorable environmental outcomes. Such processes consume much energy and produce air-polluting emissions and wastewater streams. Spent solar panels end up in landfills, which means that recycling them is more expensive than burying them in the ground. And there is nothing green about spent solar panels tucked away in landfills.

Solar tax credits are artificially lowering the cost of home solar systems and inflating the solar industry's sales revenues. In addition, governance gaps around solar panel recycling and disposal relieve the solar industry of the burden to pay for material

recovery and waste treatment. That burden is not going to go away, though. The burden of paying for cleaning the solar mess will be shifted to future taxpayers. Solar has potential, but it is not as cheap today as some people might think. The price people pay today does not include the full cost of ownership of the solar systems powering their homes.

Going solar is good, but not so fast. The easy way out of the climate change/carbon mess will lead us back in. Now what?

We need a credible plan for a transition to a green energy economy. Credible plans establish priorities and force transparency into the debate, allowing everyone to see the costs, the trade-offs, and the values such plans embody.

Investing in technologies to curb carbon emissions is both urgent and important, to make capturing carbon less costly than releasing it into the atmosphere. We must also invest in technology to improve solar efficiency and develop cost-effective solutions for solar recycling.

The full potential of solar to lower carbon emissions can be realized only when the solar industry is ready, willing, and able to shoulder the burden of solar waste treatment. Until that happens, deploying more of the heavily subsidized home solar systems, which end up in landfills, could only make the “solar cure” worse than the “carbon disease.”

Ali Agha is president of Memphis-based Think Cycle Consulting