

Tesla's Model 3 and the transition to sustainability

August 1 2017, by Steve Cohen, Earth Institute, Columbia University



The first Model 3s were delivered this week, and with it, perhaps the beginning of the end of the internal combustion era. This might be the way horse stable owners felt when they first saw a Ford Model T. The new Tesla is as snazzy as the very expensive earlier models, but its price is a more affordable \$35,000 rather than the upwards of \$100,000 cost

of more luxurious models. Elon Musk, like the late Steve Jobs, seems to know how to bring a product to market and create buzz around it. Like the iPhone and the first Model T, the trick seems to be to create a good that you know people need, or could easily learn to need. Marketing geniuses seem to have a feel for how to create and sell these goods. It seems more craft than science, but listening to Musk, you know he has that feel. It's true that a sustainable, renewable resource based economy requires fewer rather than more cars, but the cars we end up with need to be capable of running on electricity from renewable sources rather than gasoline refined from fossil fuels. The Tesla 3 is a big step in the right direction.

In the United States we need to build more and better mass transit options, but due to our land use development pattern in most of the country, personal transportation will always be part of our mix. The transition to personal electric vehicles will take decades, but clearly the marketing trick is to create a product that is loved by consumers and experts. The initial reviews of the Model 3 last week were nearly uniformly positive. [Jack Stewart in Wired observed that:](#)

"This car feels like an automotive tipping point, a sign that electric vehicles—and hopefully, the infrastructure that supports them—have finally come into their own. Time will tell whether Musk & Co. can hit their deadlines and keep production lines humming—Elon Musk revealed Friday at the Model 3's coming out party that over half a million people have now plunked down \$1,000 to reserve their own—but for now, it looks quite nice."

Tesla has to demonstrate the manufacturing capacity to build the new car effectively and efficiently, and for it to move beyond novelty, the issue of charging stations, especially for people without home garages must also be engaged. But it appears that the key battery technology needed for the electric car is here.

The growth of the electric vehicle market provides an example of how the transition to a [renewable resource](#) based economy will probably take place, particularly if you combine it with the sharing economy. As the vehicle's range improves, and its reliability is established, we will start seeing it appear in ride-sharing – services. So many more people will ride in a Tesla than will own one. Still, the Tesla is so beautiful that many people will want to buy it, own it and make sure their friends see it parked in their driveway. People will experience these vehicles via many different models of use. The transition will be very gradual. The pace of replacing the internal combustion engine will take decades. People replace their cars more slowly than they used to. [According to Antonio Bent, Kevin Roth, and Yiou Zuo](#), "the average lifetime for passenger cars has increased from 12.2 to 15.6 years between 1970s and 2000s." Cars last longer because they are made better than they used to, and while people often trade in old cars for new ones after a few years, the old cars remain in use through the used car market for many years. No one will simply toss out a car because [electric cars](#) are better and cheaper than gasoline powered cars. But the transition will take place as new electric vehicles beat out gasoline powered vehicles in the market place.

We will see a similar process as home solar energy battery installations become more affordable and reliable. Even if utilities refuse to buy back excess solar energy, if a homeowner can store it for their own use, it's easy to see how over time, they will simply decide to disconnect from the grid. We may never get distributed generation, we may simply see decentralized home generation. At first, the homeowner will notice their electric bill going down, then they will replace their gas appliances with electric ones, and after a few years without using power from the grid they'll just disconnect. We've seen this with landlines, we are seeing it with cable TV service. Electricity will be next. The pace of change will be determined by market forces and the price, reliability and attraction of new technologies.

Government and public policy could accelerate or impede the pace of change. We have seen Secretary of Energy Rick Perry try to define threats to the electric grid as a national security issue. He seems to want to prevent renewable energy from being sent to the grid. This position is absurd, but seems to be part of Trump's all out push to revive [fossil fuels](#) . Sad! It would be far better for the planet if the trend toward renewable energy was accelerated, but regardless of government's stance, it is easy to see the market appeal of low cost, completely decentralized energy.

Another key element of this transition is to ensure it is not limited to the wealthiest nations and that the environmental impact of products such as the new Tesla are monitored and minimized throughout the supply chain. As auto ownership in China, India and eventually Africa increase over the coming decades, a concerted effort is needed to leapfrog [internal combustion](#) technology and move directly into electric cars. A global economy with increased production and consumption of transport and other consumer items could devastate the planet if it is not managed sustainably. Developing a high throughput economy without massive environmental destruction is the single greatest challenge we will face in the 21st century.

The process of transitioning to such an economy is underway, and the introduction of vehicles such as the new Tesla is part of that process. The temptation to make short term profits at the expense of environmental destruction remains and should never be ignored. There are a variety of means available to counter this temptation. Visibility and exposure can be a powerful weapon to counter wanton ecological destruction. Videos of degraded rivers, toxic waste sites and other acts of destruction can be very powerful. Lower priced communication, information and the growth of environmental advocacy organizations around the world, enable consumers in the market place to learn about corporate polluters and then reflect their environmental values in their purchasing decisions.

None of this will be easy, simple or without setbacks. Earth systems observation, environmental monitoring, analysis and projection are critical to understanding the impact of human consumption. Education and communication of conditions and impacts are also critical. We need a more sophisticated understanding of the impact of our actions. When that understanding impairs the interests of powerful economic forces, we can expect powerful resistance to new knowledge and analysis. We have already seen that with tobacco and fossil fuels. Nevertheless, our dependence on science and technology for our well-being requires the use of science to understand its impact on natural systems and on our own health.

The new Tesla is a testament to human ingenuity and the power of a visionary entrepreneur. It provides an indication of what we are capable of and hopefully is an element of the broader transition we require. Let's celebrate this achievement and move on to the next one.

This story is republished courtesy of Earth Institute, Columbia University: blogs.ei.columbia.edu .

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