

# Daniel Yergin on the next energy revolution

The global energy expert and Pulitzer Prize-winning author expects an energy landscape rife with innovations—and surprises.

**The unconventional-oil** and -gas revolution—shale gas and what’s become known as “tight oil”—is the most important energy innovation so far in the 21st century. I say *so far*, because we can be confident that there will be other innovations coming down the road. There’s more emphasis on energy innovation than ever before. Unconventional oil and gas came as a pretty big surprise. It even took the oil and gas industry by surprise. “Peak oil” was such a fervent view five or six years ago, when oil prices were going up.

But I looked at this the way I did in *The Quest*, which was: Yes, we’ve gone through this period of running out of oil, but we’ve gone through at least five previous episodes of running out of oil. Each time, what’s made the difference? New technology, new knowledge, new territories. And something else that people forget: price. When we look at economic history, we see a very powerful lesson that has to be learned and relearned: price matters a lot. Price encourages consumers to be more efficient. It encourages the development of new technologies and new ways of doing things. Indeed, I think that the impact of price is often underestimated as the stimulator of innovation and creativity.

There are a number of big initiatives and opportunities that could bring changes. Certainly, the electric car will continue to be a big push, as it’s captured the imagination of some people, and a lot of investment has gone into it. Also, public policy is pushing it hard. I think it’s going to take a few more years to get a sense of the uptake, though, because electric cars are competing not with the automobiles of yesterday but with the more fuel-efficient cars of tomorrow. Another big area is electricity storage. If there’s a holy grail out there these days, it’s storage, because innovations in electricity

storage would change the economics of wind and solar power.

Distributed electricity generation will increasingly be a big question for developed countries. Electricity won't just be generated in large, central plants, but through wind power on hillsides and through solar power generated on lots and lots of rooftops. These developments make things much more complicated for the people who have the responsibility for managing the stability of the grid. They also raise important questions about incentives and subsidies that need to be worked out, such as who pays to support the grid? These will be the subject of much debate and turmoil over the next several years as we get our arms around a whole new set of issues.

I don't know what the pathway's going to be to solve the problems. But when you have a lot of bright people working on a problem in a sustained way, you will probably get to a solution. Will it be 5 years or 15 years? We don't know but, ultimately, need drives innovation. I see this as all part of the great revolution that began with the steam engine, and there's no reason to think it's going to end. It's going to continue in the oil and gas industry, and it's also going to stimulate innovations of other kinds among renewables and alternatives.

We're not always going to be able to predict where the innovations will happen. Not by any means. But this great revolution in human civilization around energy innovation is going to continue as far as we can see—indeed, much further than we can see. Of course, history tells us that geopolitics can come along and deliver some shocking surprises, but surprises are one of the key characteristics of energy over the long term. One thing we can be sure of: there are always more surprises to come.○

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