

## Biofuels and renewable energy: What China's experience can show us

When it comes to energy, we inventive humans have dug a hole for ourselves. On the one hand, we need more of it. A lot more. Every year, demand for energy rises sharply. On the other hand, the more fuel we consume the more harm we inflict on the environment. This dilemma is one of the more intractable problems defining human civilization. But there is hope. The dual prongs of our energy dilemma may be unravelled by one grand, beautiful and multifaceted solution: biofuels and renewable energy.

The Chinese biofuels market is a perfect example of how this struggle is playing out. After years of rapid economic growth, China is the world's largest consumer of energy. Once derived almost exclusively from coal, the energy landscape in China is very different today. Its burgeoning renewable energy industry looks set to revolutionize not just how China makes and uses energy, but the world too.

### From gutters to gas tanks

Wasted oil is a huge problem in Shanghai. Vast quantities of harmful oil are produced as a byproduct of keeping the city's vast population fed and productive. Over [150 tonnes](#) of "gutter oil" are retrieved from the city's sewage system ... not every year ... but every day.

The Shanghai City Council has devised an inventive solution to deal with this slimy ocean of toxic waste. Restaurants and sanitation facilities are now being paid for their oil waste, which is then converted to biodiesel fuel. Amazingly, biodiesel from waste oil is sufficient to run 104 buses and 32 sanitary vehicles. Adding to what [motioneco.com](#) describes as a "win-win", biodiesel contains less heavy metal and nitric oxide than standard diesel.

Coupled with the efforts of green car manufacturers to develop more environmentally eco driving options, biodiesel is making a significant contribution to reducing pollution in metropolitan Shanghai.

## From sea to solar

Up to [40%](#) of algae biomatter are lipids, making it a biofuel powerhouse. One acre of algae can yield 5,000 to 10,000 gallons of fuel per year. This eclipses equivalent land crops which typically produce up to 3000 gallons. The great draw of algae though is that it grows in water. By shifting biofuel production from land to sea, biofuels development no longer competes with farming and the food versus fuel problem is solved. The Chinese biofuel sector is continuing to experiment with new strains of algae to up the yield and arrive at fully scalable solutions for replacing fossil fuels.

China's commitment to transitioning away from traditional fuels is also leading to innovation in the use of solar energy. The UN's most recent [report](#) on renewable energy found that worldwide, 98 gigawatts of solar energy had been installed in 2017. Of this, a staggering 53 gigawatts came from China. Over \$85 billion was invested in solar energy by China in 2017, making it a driving force behind solar energy innovation.

While there are many examples of how solar energy is fundamentally changing the landscape of energy use in China, the possibilities are particularly intriguing when it comes to eco driving and electric cars. Capitalizing on the available of cheap and powerful mass-produced panels, solar powered car charging stations are being installed throughout the city of Shanghai. These stations actually operate far more effectively than traditional facilities, fully charging a car in as little as [30 minutes](#), day or night.

## From wasted food to eliminating fossil fuels

China recently announced plans to completely transition to biofuel derived gasoline by [2020](#). This represents a doubling of its output in two years - a truly ambitious target. A timetable has also been set in place to phase out production and sales of fossil fuel cars.

China plans to achieve this by repurposing its vast and aging corn surplus, estimated at [200 million tonnes](#). Converting this bloated stockpile to biofuel kills two birds with one stone. It handles the problem of a rapidly degrading resource while providing a way for China to lead the world in setting clean energy targets. While the long-term implications in terms of reduced greenhouse gas emissions are enormous, this represents an even more astounding immediate shift in political and economic priorities.

The result will be a proliferation of green industries. In the lead up to 2020, China is likely to experience an explosion of green car manufacturers with a strong emphasis on sustainable car production.

## **Solving the energy dilemma**

Biofuels offer the tantalizing promise of new and clever resource efficiencies. The harmful byproducts of modernity may well become the same stuff we use to produce cheap, clean and renewable energy.

China's experience of biofuels development shows that making it happen won't merely require giant leaps of innovation. It'll also require humans to scramble over some formidable political and economic hurdles.

While this transformation of industries, technologies and entire economies represents a huge challenge, China's successes show that the energy dilemma can be solved. We can hope for a cleaner, more sustainable future.