

Greening China's pumps

Can efficient vehicles and a push for alternative fuels take the edge off the country's thirst for oil?

CHINA now has 100 million cars. It is not a huge number compared with the country's population of 1.3 billion people. But as average incomes rise, so do aspirations. Many more Chinese want the freedom and status offered by their own vehicle.

Conservative estimates suggest the number of cars in China will double by 2020. To put this in perspective, consider that while China had about 34 vehicles per 1,000 people in 2009, North America had 550. In Europe, another saturated market, the number is 438. Most forecasters, including the International Energy Agency (IEA), see ownership rates in China rising fivefold by 2035, leaving it far below the saturation level of almost every nation in the developed world.

While these estimates suggest rapid growth in car ownership, they err on the side of caution. Research from the Institute of Transportation Studies at the University of California forecasts China's vehicle population could increase by 13-17% per year, matching the IEA's prediction as early as 2022.

But growth from so low a base gives China an opportunity to avoid inevitable oil addiction. New drivers don't need to switch from their old engines – the new vehicle might be their first. Keeping the gas-guzzling culture of the West at bay is now a strategy that includes promotion of electric transport, biofuels, and natural gas.

Policy intervention in China is much stronger than in Europe or the US. City planning increasingly encourages urban residents to rely on public transport. Moves are also afoot to foster the development of high-occupancy, energy-efficient transport and freight systems.

The country is pushing ahead with the development of a high-speed electric train system, due to come into operation by 2020, that will see 160,000 kms of track connect 24 cities using bullet trains capable of hitting 500 kms per hour.

Planning

Plans for electrification and for promoting the use of other alternative fuels may not have progressed as swiftly as once assumed, but public outcry over the recent spike in deadly air pollution in Beijing and other cities will trigger policy makers to re-examine, as well as accelerate, their implementation.

Some cities have put limits on car ownership. Others are encouraging the adoption of electric vehicles (EVs) by offering financial incentives. Many have banned oil-powered scooters from central business districts, sparking a surge in the use of electric bikes. The most recent data show there are 140 million electric bikes in China. Unfortunately, electric cars have yet to catch on.

The Chinese love the prestige associated with owning large conventional cars, much as Americans did in the 1950s and 1960s. And the rising cost of gasoline, which has doubled over the past five years and now retails at about \$1.27 per litre compared with 90 cents/litre in the US, does not deter Chinese motorists.

China is alone among developing economies in implementing strict fuel-economy standards, which will be driven down by 18% to 6.9 litres per 100 kms (l/100 km), or the equivalent of 34 miles per gallon, by 2015. By 2020 Beijing is planning to up this to 5 l/100 km. As for electric cars, aside from concerns over range and insufficient charging

infrastructure, the purchase cost is still the main deterrent. Electricity as a fuel costs far less than gasoline but the high price of batteries, accounting for 40% of total production cost, present a stumbling block for car makers.

The initial price before subsidies for a small EV, such as BYD's E6 is 300,000 yuan (\$48,160), double the cost of the equivalent BYD gasoline-powered M6.

To encourage drivers to choose EVs, some cities offer additional payments on top of the national subsidies, pegged at 50,000 yuan for plug-in hybrid EVs, and 60,000 yuan for pure EVs. Shanghai offers a top-up of 20,000 yuan and 40,000 yuan, respectively.

And with the likes of BMW launching its i3 battery-powered vehicle and i8 plug-in hybrid sports car in China next year, electric cars could gain some much-needed street cred too.

No charge

Electric vehicles will make inroads, especially in large urban regions, as costs come down over the next 20 years, reckons Steve Dyer, a partner with management consultancy At Kearney in Shanghai. Indeed, China's state-backed focus on technology, its rich domestic supplies of lithium and battery-production capacity bode well for the nation.

Liquefied natural gas (LNG) is also emerging as the future fuel for China's heavy-duty trucks, especially as the country harnesses its massive unconventional gas reserves.

The potential heavy trucking and shipping market that now relies on diesel and fuel oil but could switch to natural gas accounts for 2 million barrels a day (b/d) of consumption and is growing, according to Bernstein Research. China's fleet of 5 million heavy-duty trucks, by far the largest source of oil demand and street-level pollution, will double to 11 million by 2020.

The economics make sense too, with the spread between oil and natural gas at a record high. Diesel retails at \$29.59 per million British thermal units (Btu) compared with LNG at \$19.26/million Btu in Beijing.

A truck operating on natural gas costs about \$40,000 more than the \$110,000 price tag for its diesel-powered equivalent, but energy consultancy Tri-Zen says trucking companies can achieve payback from conversion within 18 months.

Cellulosic ethanol is evolving too. On paper, China's production capability is as much as 139 million tonnes in total, equal to the production from almost three oil-fields the size of Daqing, China's biggest. But a poor business model and lack of financial incentives stand in the way for the time being, says management consultancy Accenture.

Of course, fuel efficiency will make the biggest dent in oil demand over the coming decade as next-generation engines evolve.

Nevertheless, the IEA predicts China's oil demand will hit 12.7 million b/d by 2020, up from 9 million b/d in 2011. If China can get its act together, though, alternative energy could provide transport fuel substitutions that would shave 676 million barrels, or 1.85 million b/d, off oil demand by 2020, says Accenture. In the long run, China knows it has to diversify its fuel mix further and the shift to electric as well as gas vehicles has already begun. **DE** ●

