



NATURE OR NURTURE

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### SILICON VALLEY VS CHINA IN BRINGING ELECTRIC VEHICLES TO THE MASS MARKET

By IMD Professor Howard Yu – January 2014

**IMD**  
Chemin de Bellerive 23  
PO Box 915,  
CH-1001 Lausanne  
Switzerland

Tel: +41 21 618 01 11  
Fax: +41 21 618 07 07  
[info@imd.org](mailto:info@imd.org)  
[www.imd.org](http://www.imd.org)

Despite the unabated public interest in electric vehicles, the road to mass adoption has been infinitely bumpy. Better Place, an electric car infrastructure company, filed for bankruptcy in 2013, ending the promise of a comprehensive solution that would wean the world off fossil fuel vehicles. Even in hindsight, Better Place should have been the poster child for successful innovation. Led by a charismatic CEO, Shai Agassi, the company sought to resolve the intractable problems of electric cars: 1) too expensive to buy; 2) too limited in their driving range on one single charge.

The company sought to roll out a leasing model where drivers would simply pay a monthly fee, having access to a network of robotic switch stations that swap out depleted batteries for fresh ones in a matter of minutes. Agassi even had the foresight to deploy the system in denser countries such as Israel and Denmark, not competing in sprawling cities in the United States. Business schools wrote scores of books and case studies praising Better Place's strategy and courage. Yet the company went bust.

Tesla Motors, another Silicon Valley born electric car company, is also mired with technical obstacles after much fanfare in the launch of the Model S sedan. Tesla touted the sedan's capacity to drive along the entire US West Coast as the company committed itself to building a cross-country network of free electric car charging stations. Its outrageous price notwithstanding, one Model S was caught on film (subsequently uploaded to YouTube) when the battery pack exploded, engulfing the passenger seat in flames.

A very different story is emerging in China. BYD, headquartered in Shenzhen, has been selling electric cars in China since 2008. Its electric buses are deployed in cities such as Changsha, Xian, and Tianjin, while 800 of its electric taxis are in full operation in its home city. The company signed a \$12.1 million contract last year to send a total of 35 electric buses to Long Beach and Los Angeles. It also won an order in the Netherlands, and began a trial run in Poland and Canada. So why does China's BYD seem to be on a smoother track than all the Silicon Valley wizards combined?

Perhaps the answer lies not with the Holy Grail of electric technology – the electric sports car – but with the lowly e-bike. Back at the time when BYD prepared to be listed on the Hong Kong Stock Exchange in 2002, its IPO prospectus described the company's R&D activities as focused primarily on the less-demanding battery sectors such as e-bikes, portable electronic devices, and mobile phones. An e-bike is basically a small battery powered motor to give the rider an extra boost. E-bikes normally travel at speeds of 20 to 30 mph, they charge from a regular electric socket and are cheap, selling at about \$1,000. The baseline model of Tesla's Model S sold at \$62,400.

E-bikes are big in emerging economies. There are more than 200 million in China. Brazil reported a 200% sales growth in 2012. The Philippines has ordered 100,000 electric powered three wheelers. In contrast, the US has been discouraging e-bikes, citing safety reasons. New York City outlawed e-bikes completely in 2012. Of 29.3 million e-bikes sold in 2012, only 53,000 were sold in the US.

Not surprisingly, China dominates the market with an estimated 90% market share and manufacturing capacity. Shandong province alone is home to 20 automakers that produce more than 125,000 low speed electric vehicles - that resemble a Tata Nano but run on electricity - targeting elderly or disabled users who use such vehicles to stay active. The result? A much more vibrant ecosystem where local firms fiercely compete against each other with real customers and tangible demand; this in turn leads companies to optimize R&D, production, and logistics processes that directly create value for consumers. While companies are busy ploughing profits back to R&D activities to stay ahead of competitors, the country as a whole has developed process-based competitive advantages.

The stark contrast between Better Place and BYD is testament to Warren Buffett's famous rule of investing: When management with a reputation for brilliance tackles a business with a reputation for bad economics, it is usually the reputation of the business that remains intact. In the case of electric vehicles, companies that are born in the right place get onto the right learning path and flourish. The problem of Silicon Valley was not due to their engineers; companies were simply starved of real customers. Indeed, when eyeing the next big thing, Wang Chuanfu, CEO of BYD, said the firm was developing a sports car that would compete with Tesla Motors and vowed not to rely on Silicon Valley for technologies for intelligent cars.

Perhaps the biggest endorsement of China's ability to bring electric vehicles to the mass market comes from Buffett himself: His firm Berkshire Hathaway bought nearly 10% of BYD in 2008.

*Howard Yu is Professor of Strategic Management and Innovation at IMD, where he teaches in the Orchestrating Winning Performance and Building on Talent programs. His teaching and research activities focus on why and how some firms can sustain new growth while others cannot.*

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