

## Public Transportation Sector: ultra-capacitor buses

China

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Buses are an effective form of public transport for cities because they require little in the way of additional infrastructure costs, carry a large amount of people, and can be provided at low cost to the consumer. Studies show that diesel buses consume 120-150 liters of fuel per day, based on driving distances of 220-280km per day. This equates to an average of 30 sedan vehicles for one bus on the road daily.

China and the Chinese private sector have foreseen this challenge and have begun investing heavily in ultra-high capacitor electric buses. One such company, Sinautec Automobile Technologies LLC, has been at the forefront of the technological development of ultra-high capacitor electric buses. Their vehicles are designed to run on a fixed route, and as they arrive at a bus station, the driver elevates a collector on top of the bus to an overhead charger at the station, recharging the ultra-capacitors. The driving range of Sinautec's bus is around 1 mile with a 30 second charging period, due to its rapid charge and discharge batteries. For flexible distance routes, the bus also contains a lithium ion battery bank that gives it a range of up to 50 miles without charging. In addition, the vehicles' electric motor also acts as a

### Quick facts

Zone	Shanghai and the entire territory
Topic	Sustainable transport, electric vehicle, electric bus
Company	Sinautec Automobile Technologies LLC
Website	www.sinautecus.com

Case Study



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generator, transforming up to 40 per cent of the kinetic energy of deceleration through the use of regenerative braking to electricity to charge the batteries.

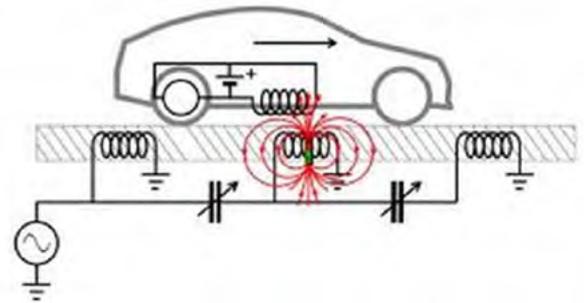
These buses are competitive on a cost-basis with conventional buses when based on fuel savings over the vehicle's 12-year life and use based on current oil and electricity prices. Sinautec estimates that one of its buses has one-tenth the energy cost of a diesel bus and can achieve lifetime fuel savings of over 200,000 USD.

Shanghai currently has 300 electric buses out of 18,000 running through the city, and the municipal authorities have been willing to incentivise private-public partnerships to integrate more charging stations within the city's transport network, as well as to advance and promote campaigns for clean-energy transit systems.

In the United States, a Stanford University research team has designed a high-efficiency charging system that uses magnetic fields to wirelessly transmit large electric currents between metal coils placed several feet apart. The long-term goal of the research is to develop an all-electric highway that wirelessly charges cars and trucks as they travel down the road.

With this wireless charging system implemented on a fixed bus route, the Sinautec bus and other electric vehicle developments would benefit greatly, with shorter charging periods, more range, less hassle for the drivers, and more flexibility for consumers.

When coupled with solar panel systems at bus stations and terminals, and on the buses themselves (e.g. BYD K9 bus in China), the implementation of these technologies could lead to a revolution in how people travel in cities.



A great way to pilot this technology is to retrofit existing infrastructure with it, such as the Bus Rapid Transit system in Bangkok (BRT), which is already a fixed route system with terminals at similar distance away for local communities to increase the usage of public transport versus private vehicles. This would have double dividend effect by improving the quality of the environment and creating new economic opportunities.

### References:

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