Electric taxi 'EVA' for tropical megacities

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At the 43rd Tokyo Motor Show electric taxi "EVA" showcases a new super-fast charging system recharging the battery within 15 minutes, a range of 200 kilometers and an individual air conditioning. EVA has been developed at TUM CREATE, a joint research program by Technische Universitaet Muenchen and Nanyang Technological University. Credit: TUM CREATE

TUM CREATE has unveiled its electric taxi prototype, codenamed EVA, at the 43rd Tokyo Motor Show today. It will be on display at Booth 8 in West Hall 4 of the Tokyo Big Sight from 22 November to 1 December 2013. EVA serves as a platform to showcase the results of the

innovations and developments at TUM CREATE, a joint research program by Technische Universitaet Muenchen and Nanyang Technological University.

A key highlight is the car's super-fast charging system. It is designed to be recharged in just 15 minutes to cover a realistic range of 200 km (based on Singapore driving patterns), which will be an industry benchmark. Other features found on EVA include the extensive use of lightweight materials and energy-saving solutions such as individualized overhead air-conditioning.

"This new electric taxi for tropical mega cities, developed and constructed by two leading universities, highlights the successful collaboration of TUM and NTU," said Prof. Dr. Wolfgang A. Herrmann, President of Technische Universitaet Muenchen. "The scientific and technological breakthrough is based on a spirit of mutual trust and understanding. For more than ten years, TUM has been operating its branch TUM Asia in Singapore, with currently 380 students and many hundreds alumni. It is a great joy for me to see that our years long, joint efforts, supported by the National Research Foundation, bears now fruits."

Professor Bertil Andersson, president of Nanyang Technological University, said the technological innovations developed for EVA is a great demonstration of how two of the world's top engineering universities can successfully collaborate to combine their expertise and knowledge to solve the tough challenges of today. "NTU's deep expertise in energy technologies, such as battery systems, wireless charging, and materials science, in combination with TUM's strengths in automotive and electro mobility, gave our research team a strong platform in which to design and build EVA on," Prof. Andersson added. "A robust and energy-efficient electric taxi for use in real world conditions is testimony of our strengths in engineering and how we apply it to make a

difference. It is also a reminder to the world that it is essential for all of us to play a part for our environment and such R&D efforts is an investment towards a more sustainable future for everyone."

Transportation companies around the world typically re-purpose passenger cars as taxis. However, the challenge of current electric vehicles is the extremely limited range and long recharge times (up to 8 hours), making them impractical as taxis. TUM CREATE aims to address these issues, as well as the unique challenges posed by the heat and humidity in tropical megacities, through its research and development. Unlike temperate climates, passenger cooling and battery pack heat management are issues specific to tropical and equatorial regions.

As a form of public transportation, introducing e-taxis into the local taxi fleets has a high leveraging effect to decrease carbon emissions. "While taxis account for less than 3% of the vehicle population in Singapore, they contribute to 15% of the total distance travelled," explains Principal Investigator Dr. Daniel Gleyzes. "The average two-shift taxi covers over 500 km a day."

EVA was designed from the ground-up as an e-taxi and is a result of interdisciplinary research in the areas of energy storage, battery charging, thermal management, and lightweight materials and design. TUM CREATE is funded by the Campus for Research Excellence And Technological Enterprise (CREATE) program under the National Research Foundation (NRF), an agency of Singapore's Prime Minister's Office.

Professor Low Teck Seng, NRF's Chief Executive Officer, said, "The launch of this prototype electric-vehicle today marks a major milestone for TUM CREATE. In the short time since TUM and NTU came together at CREATE in 2010 with support from the NRF, they have

developed strong research and engineering capabilities in e-vehicular technology resulting in this demonstrator. With EVA, we have a public commuter car that is green, energy-efficient, and tailored for a tropical urban environment. We look forward to this partnership strengthening in the years to come."

This project milestone marks the first time that a Singapore-based organization is participating and presenting a vehicle in the 59-year history of Asia's most important automotive tradeshow.

EVA is an important component of Technische Universitaet Muenchen's research on electric mobility. In 2011 TUM's concept car "MUTE", especially intended for private use, received international attention at the International Automobile Exhibition in Frankfurt. Another project of electric mobility research at TUM is the Innotruck, a diesel-electric powered truck. It serves as a testbed for research around improving the efficiency of trucking and the networking of trucks and electric vehicles. Another project of TUM CREATE was the electric two-wheeler VOI, presented in spring 2013. This was primarily designed for use over short distances. Electric mobility research is part of the research focus of TUM.Energy coordinated by the Munich School of Engineering.

 More information: www.eva-taxi.sg/

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