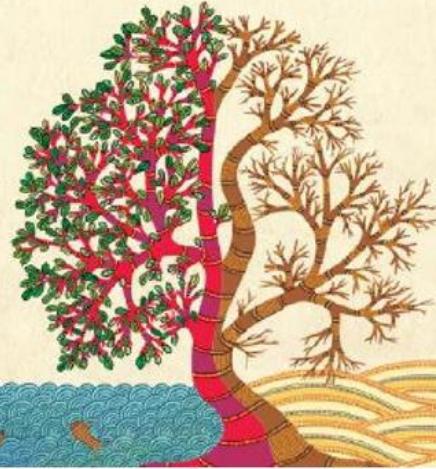


15th DELHI SUSTAINABLE DEVELOPMENT SUMMIT

Sustainable Development Goals and Dealing with Climate Change

February 5-7, 2015, New Delhi, India

Curtain Raiser – February 4, 2015
High Level Corporate Dialogue



Electric Mobility- Shaping the future of Sustainable Urban Mobility

Sustainable Mobility Thematic Track in collaboration with BMW



February 6, 2015 | 1045 – 1245 hours| Venue: Durbar Hall, Taj Palace Hotel, New Delhi



10:45AM-11:10 AM- Welcome remarks and inaugural address

Welcome remarks	Mr S Sundar, Distinguished Fellow, TERI and Former Secretary, Ministry of Surface Transport
Introductory address	Mr Philipp von Sahr , President, BMW India
Special address	Dr Rajendra K Pachauri, Director General, TERI

11:10-11:50 AM- Presentations (10 mins each)

Revolutionizing (E)-mobility: A holistic approach to sustainability	Mr Glenn Schmidt, Director of Steering of Government and External Affairs, Sustainability Communications, BMW Group
Scenario and plans for electric mobility in India	Dr Sajid Mubashir, Member R&D, National Automotive Board (NAB), Department of Heavy Industries
The experience so far with electric 2Ws in India and the planned future	Mr Sohinder Gill, CEO, Global Business for Electric Vehicles, Hero Electric
Costs and benefits of using PHEV buses for public transport in Indian cities	Dr Ujjwal K Bhattacharjee, Senior Fellow, TERI

11:50AM-12:30 PM- Panel discussion

Can electric mobility shape the future of sustainable urban mobility in India?

Chair

Mr Martin Wright, Director, Forum India

Panelists

- Dr Sajid Mubashir, Department of Heavy Industries
- Mr Glenn Schmidt, Director of Steering of Government and External Affairs, Sustainability Communications, BMW Group
- Mr Pawan Sachdeva, Senior General Manager, Public Affairs, Mahindra and Mahindra
- Dr Jabez Dhinagar, Vice President, TVS Motor Company
- Mr Vernon Noronha, Vice President- Defence & Government Business , TATA Motors
- Mr Akshay Ahuja, Analyst, India Smart Grid Forum

12:30 PM-12:40 PM – Open house discussion

12:40 PM-12:45 PM – Vote of thanks

Electric Mobility – Shaping the future of Sustainable Urban Mobility

Sustainable Mobility Track in collaboration with BMW

The track deliberated on opportunities and challenges involved with electro-mobility, drawing from experiences around the world and contextualizing the solution for India. Mr S Sundar, Distinguished Fellow, TERI chaired the first session. He outlined the current transport scenario in India and highlighted some of the prospects and challenges of mainstreaming electric vehicles (EVs) in the country. He pointed out that electro-mobility can pave way for clean mobility, given that the challenges associated with electro-mobility, like producing clean electricity, reducing dependence on imported batteries, recycling batteries, etc. are resolved. Mr Sundar also emphasised on the need for incentives to increase research on electric mobility and solar vehicles and related technology and also for encouraging people to adopt electric mobility. He was followed by Mr Philip Von Sahr, President, BMW India who commented that sustainability has to be embraced in all its forms – ecological, social and economic. He pointed out the relevance of introducing electric mobility for sustainable development and described the holistic approach adopted by BMW and showcased the initiatives being taken by BMW in contributing to electric mobility. He conveyed that BMW focuses on continuously decreasing energy use and increasing use of renewable energy across their operations and that by 2020 the company is aiming to reduce resource consumption per vehicle produced by 45% as compared to 2006 levels and to reduce the emission levels of the vehicles sold in Europe by 50% from 1995 levels. Dr R K Pachauri, Director General, TERI stressed on the need to build a roadmap, rooted in reality for EVs in India with the collaboration of industry and research institutes. He also voiced his opinion on how clean electric vehicles are when the electricity is being generated from thermal power plants.

Mr Martin Wright, Director, Forum for the Future, India, took over as chair for the second part of the session. Mr Wright expressed that with the National Electric Mobility Mission Plan (NEMMP) in the background, the time is promising for achieving electric mobility in India. He also emphasised that one of the main obstacles in adopting electric mobility in the country was financial constraints and that electric vehicles need to be made affordable for the consumer. He stressed that India has to take up the opportunity and integrate the drive for solar electricity with the drive for clean electricity to power clean electric cars. With this he opened the session for presentations.

Presentations made by the panellists covered various aspects of electric mobility and highlighted the Indian Government's vision for electric mobility in India. The first presentation was made by Mr Glenn Schmidt, Director of Steering of Government and External Affairs, Sustainability Communications, BMW Group on “Revolutionizing (E)-mobility: A holistic approach to sustainability”. He gave insights on the motivation behind the BMW group in taking up electric mobility pathway and the BMW i-series value chain and vehicle design innovations and talked about how through innovations, BMW has been able to reduce energy requirements for its vehicles by 50%, water requirements by 70% while using 100% renewable energy during the production of the ‘i’ series. He informed the participants about mobility services such as car sharing schemes like “Drive now” which could completely revolutionize the nature of personal mobility. He explained that markets that offer the right framework conditions such as monetary incentives in the form of tax

breaks, financial incentives and non-monetary incentives like access to infrastructure, parking privileges and demonstration projects, provide the right ecosystem for promoting electric mobility and this has been proved by experiences across countries with high penetration rate of electric vehicles.

Dr Sajid Mubhasir, Member R&D, National Automotive Board (NAB), Department of Heavy Industries, Government of India talked about the “Scenario and plans for electric mobility in India” and shared various initiatives and strategies being planned in the country to promote electric mobility. He emphasised that the main wheels that would drive electric mobility in the country are consumer incentives, charging infrastructure, technology platform and supply chain development that would catalyse manufacture and promote sale of electric vehicles. He mentioned that the National Electric Mobility Mission (NEMM) will be starting by April 2015. The Mission would draw up a table of incentives and a quick delivery system of incentives for the consumers, he said. He explained that under the incentive, the consumer will get 20% taken off from the cost of the electric vehicle and that the support would extend to 2-wheelers, 3-wheelers and small cars for the next five years. He also stressed that the government will simultaneously focus on creating employment, creating skilled manpower and engaging industry and research institutions to make this electric mobility mission sustainable in the long run.

Dr Ujjwal K Bhattacharjee, Senior Fellow, TERI highlighted “Costs and benefits of using PHEV buses for public transport in Indian cities”. Taking from the lessons learnt from a feasibility study on introducing PHEV (plug-in hybrid electric vehicle) technology buses for public transport in Indian cities, conducted by TERI for Government of Gujarat, he stressed on the importance of batteries in the adoption of various electric vehicle technologies.

The presentations were followed by panel discussions which explored the various initiatives being taken by players in the Indian automobile industry to take the mission of electric mobility in India forward.

Mr Pawan Sachdeva, Senior General Manager, Public Affairs, Mahindra and Mahindra, commenced the discussions highlighting that Mahindra and Mahindra is the pioneer of electro-mobility in India. Though Mahindra’s electric car, e2O, has been well received globally, he is of the opinion that the Government in India needs to undertake a lot of measures to ensure demand creation for EVs in the domestic market. One of the challenges for sustainable urbanization in India is the rapid growth of transport demand. This is coupled with inefficient use of resources, which lead to huge degradation of the environment. This especially stands true in the case of the transport sector and hence, there is a need to look for smart solutions of which the low emission electric vehicle is one such solution. He pointed out that electric vehicles are significantly more efficient, almost 7-10 times, than internal combustion engine (ICE) vehicles and they could be zero carbon generating when powered by solar electricity.

Mr Sachdeva further stated that questions are often raised about how electric vehicles would be powered given that the Government is targeting 6-7 million EVs to roll out by 2020. The speaker explained that in order to charge these vehicles only 830 MW of energy would be required, which forms only 0.33% of the total power demand in the country. Also, if one looks at the 24 hour electricity demand curve, during the night time electricity demand falls to 50%. The charging of EVs could also be done during these off-peak periods. The 6-7 million EVs could also be easily powered if transmission and distribution losses are cut down by 1.44%. In an interesting comparison, the speaker highlighted that 3.4 million air conditioners (AC) were sold last year. Assuming that these were 3 star rated ACs, their electricity consumption would be 1 kw energy per hour. If the ACs operated 4 hours per day for 6 months, the power consumed is enough to power 2 million EVs.

He suggested that the EVs also fit in the Government's current Smart City agenda as they are smart cars; they are connected to the consumer and to the grid. They can be charged during off-peak demand periods and feed electricity back to the grid during the peak hours, this way they can also offer almost free mobility to the consumers. Mr Sachdeva also spoke about the solar charging option that Mahindra and Mahindra has developed, which makes e2o almost a zero carbon car.

Dr Jabez Dhinagar, Vice President, TVS Motor Company, highlighted the perspective of the electric two-wheeler industry. He said that the total two-wheeler industry expected a production of 15 million vehicles this year and 35 million by 2020 implying two wheelers would constitute largest elements of mobility in India. He mentioned that even in NEMMP 2020 targets, two-wheelers constitute bulk of the electric vehicle volumes. However, two-wheeler electrification is faced with a lot of challenges such as developing home grown technology base, developing low cost electric two-wheelers solutions, etc. Dr Dinaghar also highlighted the typical consumer need and consumption pattern with respect to two-wheelers in India where almost 80% consumers covered only about 15-20 km per day. He suggested that a vehicle is treated as a very precious personal possession in India and a two-wheeler is mostly parked inside the home and is general well maintained. As a result, these vehicles tend to have an extended life cycle beyond 10 years as it is usually reused in smaller towns and villages.

Dr Dinaghar also discussed his company, TVS' roadmap with respect to fleet electrification, stating that initially the company would focus on hybridization and later on pure electric technology. Bringing cost down to consumer's affordability level posed to be a great challenge because of high cost of lithium; and he said that this issue would still exist even after the government rolled out its incentive package for xEVs (hybrid and electric vehicles).

There are also inherent advantages in two-wheeler electrification as it does not need an extensive charging infrastructure and the existing domestic sockets could be used to charge them. The electric two-wheelers could also be amalgamated with the solar rural electrification programs and smart city initiatives. Dr Dinaghar stated that his company's strategy was to produce a 50% mild hybrid fleet and 10% electric fleet by 2020.

Mr Vernon Noronha, Vice President- Defence & Government Business, TATA Motors, focused on three important issues related to electric buses in the Indian context – infrastructure, funding and weight of the battery.

Mr Noronha informed that TATA Motors is spearheading a program wherein they have developed hybrid buses, which do not require any external charging infrastructure; therefore this technology could be used as a low hanging opportunity to introduce electro-mobility in the public transport sector in India. This advantage he felt was critical, since developing large scale public infrastructure often takes a lot of time due to a number of government clearances required.

Mr Noronha emphasized that in order to encourage hybrid buses the government needed to subsidize these buses especially for the use of public transport. This he felt was essential for demand creation as the demand is not going to come from the private sector but from public bus corporations. He also added that the current thinking within the government to bridge fund for xEV bus initiatives might not be enough because bus corporations find investment in hybrid/ electric buses as a high risk investment as the technology is still new. The government therefore needs to extend funding support from basic bridge-funding to full funding so as to encourage demand for such buses.

Mr Noronha mentioned that at TATA Motors have also been able to get around a key challenge with batteries and have been able to reduce the weight of the battery. In case of all-electric buses, the weight of buses often increases so much that there is hardly any capacity left for carrying passengers. In one such all-electric bus which weighed 4 tonnes, the batteries ended up weighing 3.8 tonnes, he highlighted, which has been solved in TATA's hybrid buses. Batteries weigh 400 kg in hybrid the hybrid bus and therefore there is enough payload capacity to accommodate 50-60 passengers. The speaker highlighted that the weight issue becomes critical in the Indian context as there are stringent restrictions on gross weight of the vehicle.

Mr Akshay Ahuja, Analyst, India Smart Grid Forum highlighted that there was a need to develop charging infrastructure to encourage electro-mobility in the country. He mentioned that it is important to standardize charging infrastructure to reduce costs for setting up of charging infrastructure. The approach should be to study international best practices and customize them for Indian context, he said. He emphasized the importance of developing business models which made use of electric vehicles easy for the consumer. For instance, developing pre-paid electric metering systems within the car, so as to facilitate payment for electricity on monthly basis.

Mr Ahuja mentioned that it was important that the distribution companies worked hand in hand with the other stakeholders of electric mobility to develop electric charging infrastructure. He felt that it was extremely important that the distribution companies viewed EVs as an asset rather than a liability since EVs could be used for applications like grid balancing, battery bank etc.

With these discussions and deliberations the session came to a close with a round of thanks by the Chair, Mr Wright.