



Why Two Smart Grids Make Sense



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Twenty-seven electric vehicle models will come to market in 2011. While an immediate rush to buy is not anticipated, most analysts agree that electric vehicles are here to stay. Given the support this technology has received from governments in the United States and abroad, one could argue that this technology is too important to fail.

As car companies compete ferociously to persuade consumers that their new ride is best, two fundamental challenges loom ahead for this "electric wave." Both promise to be daunting. One is being

robustly embraced, while the other has largely met with indifference. How we address both will go a long way in determining this automotive technology's ultimate acceptance by consumers everywhere.

Challenge One: Creating A Smart Electrical Grid

Most nations have a "refueling infrastructure" for gas powered vehicles: gas stations. Drivers can refuel in a matter of minutes in virtually every neighborhood. As the consumer market for electric vehicles grows, electric-powered vehicles will eventually need a similarly convenient, fast "recharging infrastructure." Like gas stations, the infrastructure should be seamless and efficient. For that to happen, however, the overall electrical infrastructure will need to provide adequate power to meet anticipated demands. So a charging system for electric vehicles must be viewed as part of a much larger system.

Creating an overall system that distributes eco-friendly, renewable electricity effectively while conserving it efficiently raises challenges of profound proportion. By way of example, it must accommodate an ever-widening array of systems and equipment whose power needs range from low to ultra-high voltage. Safety, reliability, and durability will be critical. Monitoring and control should occur at individual, home, business, neighborhood, regional, national, and global levels.

Enter electric vehicles. During charging, each electric vehicle can be like adding another home to the grid. Demand for electricity will increase as more such vehicles are sold and as consumers expect an infrastructure that eventually provides for "fast charging" (i.e. comparable to a gas fill up) as opposed to a "slow charge," which can take up to eight hours. Unless effective on-board recharging becomes the norm, that growing demand will also likely be clustered (i.e. concentrated in certain areas), which may create power distribution issues among utilities.

We, of course, are not "writing on a blank slate". Unlike the automotive industry, which has globalized, utility companies have tended to be far more "local" by nature. For example, the United States has more than 3,000 utility companies. Germany has more than 800. To say these are decentralized systems is putting it mildly. Preparing for anticipated future electricity needs requires that these companies take a much more collaborative commitment to integrate into a grid that channels necessary amounts of electricity where and as needed and then shuts power down efficiently to conserve for future needs.

At the moment, electric grids are neither prepared nor particularly smart. Herein lies the first challenge. So the overall energy grid to power these exciting developments, including electric vehicles, must get "smarter" – a lot smarter. To some, the prospect of harmonizing energy efforts among so many utilities can seem insurmountable; and clearly, we have miles to go to achieve that reality. But many coordinated

initiatives are busily working on doing precisely that. Their existence stands as encouraging proof that we understand the challenge and fully intend to meet it.

Challenge Two: Creating A Smart Regulatory Grid

The global automotive industry has always been heavily regulated; and nations have tended to formulate their own unique safety and environmental regulations. This worked well when car companies sold primarily in one or two markets. But, these days, to achieve economies of scale and heightened efficiencies, among other things, automotive companies “think and act globally” both in design, manufacturing, and marketing.

Notwithstanding this material shift in the industry's expanded footprint, governing regulations remain largely nation-by-nation. Consequently, the resultant "global regulatory grid" for manufacturers resembles a patchwork quilt (or gauntlet) consisting of divergent regulations. In today's automotive world, especially in the electric vehicle space, diversity of regulations that result in needless, considerable delays in bringing product to market and untold, avoidable expenses that can balloon into the billions of dollars is just plain dumb.

For decades, efforts have been made to take a more collaborative approach to formulating and revising these critical regulations. Highly regarded organizations like, SAE International and others work tirelessly to reconcile technical requirements among markets. But the prevailing "first to market" mentality in this highly competitive industry, while effective for advancing technology; impedes efforts to harmonize regulations. Likewise, perpetuating regulatory divergence seems to work well for various nations, too. These impediments have created a mindset of "that's just the way it is." In an era where every penny and employee counts, however, are these impediments worth the additional billions of dollars to certify products without measurable added benefits to the public? In the electric vehicle space, clearly not.

Taking a global "best practices" approach to regulations that govern EV-related technology has numerous, tangible benefits (i.e. more than cost savings). For starters, EVs improve the environment. Once in place, harmonized regulations would reduce both the manufacturing costs as well as the time for new product development. This, in turn, should serve to reduce purchase prices. Reduced prices would result in more citizens purchasing these vehicles.

That development would also improve geo-political considerations by reducing energy dependence on less stable areas of our world. Clearly, promoting more sustained, international collaboration would have numerous other benefits, especially in these challenging days. These illustrate a few measurable benefits

that regulatory convergence through harmonization would promote. Perhaps most importantly, this enlightened approach can and does work.

Sustainable Regulations

A credible, innovative, and sustainable forum exists for creating harmonized environmental and safety regulations through global collaboration. The United Nations World Forum for Harmonization of Vehicle Regulations (**WP.29**), facilitates these efforts through the global agreements it administrates. As a United Nations forum, it serves as a catalyst for government regulatory officials, technical experts, and representatives of non-governmental organizations from over 50 different countries to meet in an innovative and collaborative environment.

The forum it provides and the agreements that it administrates enables WP.29 to achieve a workable balance between regulatory harmonization and the sovereign rights of participating nations. It presents the means to facilitate the international collaborative development of standards and regulations that, when adopted into national laws, provide the basis for global uniformity of vehicle performance. Never has this concept been more essential.

On a practical level, business case sustainability in the EV segment looms as a huge issue for the industry, particularly if (or when) government funding ceases and gasoline prices stay relatively unchanged. Satisfying environmental and safety regulations on a market-by-market basis is extremely expensive. These are sobering realities; and profits from EV products may well remain low for some time. Herein lies the second challenge of creating a regulatory “smart grid” for electric vehicles. Like the first, it also seems insurmountable. But unlike with the first, it is doubtful that this challenge is receiving the attention it needs and deserves.

The solution lies in the power of open and sustained collaboration. What better way to embrace that critically needed spirit than in nations formulating harmonized regulations that are science-based (i.e. the process is objective, reproducible, data-based, and workable)? Doing so would provide, among other things, reduced barriers to international trade, needed uniformity in procurement, guidance to achieving targeted goals, benchmarking points, and assistance in conflict resolution. In addition to the business case sustainability considerations, these are major reasons why in-process national EV regulations should be prime candidates for global harmonization.

Should we perpetuate a global regulatory system consisting of numerous, divergent and uncoordinated efforts? Or do we need a more holistic, deliberative, and iterative approach to develop – then improve –

regulations that best position this new technology for success? The mere posing of the question mandates only one practical response: governments owe it to both their citizens and industry to work in a globally inclusive forum in creating mutually acceptable regulations that support these critical, innovative industry-wide efforts to achieve global transportation goals.

At this juncture, EV technology has shifted from "if" to "when." More and more people will hear about concerted efforts to make our electric grids smarter as we prepare for the "electric wave." It is good to see that we are focusing on preparing for that challenge, which most assuredly lies ahead. In a similar vein, however, governments should make similar concerted efforts to create a supportive global regulatory grid for this exciting new technology. Doing so in a way that maintains and promotes national sovereignty is just plain smart.

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