

case study

Next Steps: A Path Forward

The China State Grid, National Energy Administration (NEA), United States Trade and Development Agency (USTDA) and United States Department of Energy (DOE) are pleased with the results of the demand response project in Tianjin. The program results show promise for demand side management investments at both the local Tianjin and national levels.

“Cutting demand and consumption is the cheapest and cleanest source of energy, and this project helps bridge the gap between the utility and its customers to make ‘using less’ easy and automatic,” said **Stephen Shang, President of Honeywell China.**

“We are honored to join hands with Honeywell to conduct China’s first smart grid demand response project at TEDA,” said **Ai Yaming, Vice-Chairman of TEDA.** *“This is a very important energy saving initiative for TEDA on our mission to build a resource-efficient and environmentally friendly environment.”*

Looking ahead, China has announced clear support for energy efficiency and demand response with the funding of the Demand Side Management (DSM) City Initiative for 2013-2015. The success of the TEDA project can contribute to the success of future DSM demo

city projects. Several of the next demo cities, for example Suzhou and Foshan, have expressed interest in using Honeywell’s DSM technologies. The long-term goal is to achieve an optimal, real-time balance between electricity supply and demand through two-way information flow.



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Honeywell

Honeywell has implemented China’s first Smart Grid Demand Response Project in TEDA

To demonstrate the feasibility of adopting demand response solutions within China’s grid infrastructure, Honeywell established a pilot project that included a field installation and demonstration of Honeywell demand-side management technologies.



The Case for Demand Response and Energy Efficiency

A reliable power supply is critical to China's national security, economic growth and the general welfare of its population. However, without making fundamental changes to how the electric grid operates, the task of delivering adequate electricity supply is becoming more and more difficult. In terms of electricity supply, China is seeking cleaner and more economic energy sources. And, in terms of electricity demand, many segments of society — and especially the manufacturing sector and the middle class — are consuming ever-increasing amounts of electricity. As such, China is seeking innovative ways to tackle this growing economic issue.

China continues to invest heavily in large scale renewable energy, principally wind and solar energy. A challenge however, is that wind and solar energy are intermittent resources. Additional support is often required to supplement wind and solar generation utilized by grid operations. Automated demand response (AutoDR) offers China an important alternative to fossil-fuel generation, and provides the clean, fast and reliable support needed to integrate wind and solar energy in a more stable manner onto the electric grid.

Demand response and energy efficiency measures can help users reduce their electrical usage on a permanent (energy-efficiency) and a temporary (demand response basis). Utilizing both methods can result in overall consumption reduction and peak load reduction, which, as a result reduce the number of baseload power plants needed.



Project Background

Realizing the promise of demand response as a cost-effective alternative to constructing new power plants, The China State Grid and China Electric Power Research Institute (CEPRI) selected Honeywell to develop the Demand Response System pilot. The project was jointly sponsored by the Chinese and United States governments through the U.S.-China Energy Cooperation Program (ECP), which aims to develop a nationwide set of smart grid industry standards and regulations in China. The pilot city partner for the project

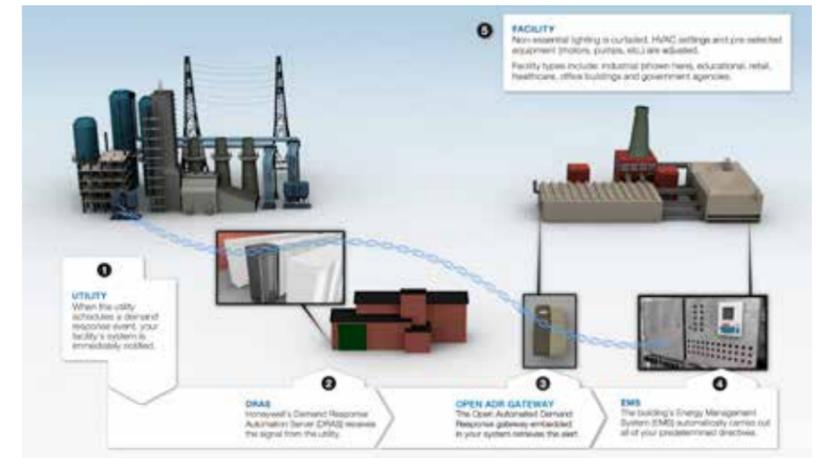
was TEDA and the utility companies that participated were State Grid, Tianjin Electric Power, and the TEDA Electric Power Company.

TEDA is one of the most highly recommended economic areas in China, and is identified by its dynamic economy, outstanding investment environment, sophisticated utilities and convenient transportation network. TEDA's highly developed economic and manufacturing environment made it an ideal partner to test the feasibility of adopting demand response solutions within China's grid infrastructure.

Honeywell Solution

In electricity grids, demand response mechanisms manage customer consumption of electricity in response to supply conditions, for example, having electricity customers reduce their consumption at critical times or in response to market prices. The normal mechanism for this is a manual demand response signal, though this method is labor-intensive. Honeywell's automated demand response (Auto DR) technology makes participation easier and load-shedding more effective by initiating through an external communications signal rather than using a manual signal.

With Honeywell's Auto DR Technology, customers can establish customized energy reduction strategies for their facilities that are put into action automatically by utilities during a demand-response event. Through



Auto DR, utilities can quickly and reliably reduce overall energy consumption during peak use periods, and commercial customers can cut their energy use and costs without compromising critical operations. Auto DR helps reduce greenhouse gas emissions and the need to run expensive "peak power" plants, which typically sit idle until customers

require more electricity than the utility is able to provide using its primary, base-load generators.

Deployment of Auto DR can effectively reduce peak loads by 15 to 30 percent and, when done at scale, create the effect of a "virtual power plant" that generates "negawatts"—or reduced demand—instead of megawatts.

Customer Benefits

Honeywell implemented demonstrations of its demand response technology settings including two commercial buildings, the TEDA Administration Building and TEDA Library; and one industrial building, the Kumho Tire manufacturing and Vestas (Tianjin).

- The two commercial buildings reduced their power loads by 15%.
- The industrial site's load reduction varied with production schedule, but saw a reduction of 7.7% during full production. When not at full production, the site's demand response shed capacity increased significantly to more than 30%.
- From a load shed stability perspective, the two commercial buildings provided a more stable and consistent load-shed response, shedding between 15 and 20%.
- The demonstration proved successful and provided important validation of AutoDR technology as a viable energy-source for China.

