A global blueprint for clean manufacturing
BYD’s vision for a zero-emissions future starts with its own operations.

How a high-tech manufacturer forms a new partnership to reduce the impacts of its global footprint.

“Partnering with EDF Climate Corps enabled BYD to consider operational improvements that could drive down energy use and reduce carbon emissions while continuing to produce environmentally friendly products like our battery electric buses, trucks, fork-lifts and SkyRail.”

- Stella Li, President BYD Motors

**Summary**
BYD is a high-tech company devoted to technological innovations for a better, low-carbon future. So it only makes sense that the company holds its own operations to high standards of clean production. BYD sets annual company-wide energy-saving and emission-reduction measures, but, determining how to reach those targets can be a challenge for individual facilities. In the summer of 2018, BYD turned to a new resource: EDF Climate Corps. EDF placed eight graduate-level fellows with BYD facilities across the U.S. and China to identify projects that would reduce both energy use and greenhouse gas emissions.

BYD, a global pioneer in energy solutions and the world's largest manufacturer of electric vehicles, is dedicated to building a more sustainable, zero-emissions future through electrification and clean energy solutions. The international company operates with the belief that innovation and technological development can get us there.

But beyond helping others reduce energy use by manufacturing and selling new energy products – like electric vehicles, solar energy products and battery storage – BYD is working to reduce the energy use and carbon emissions associated with its own operations.

In 2018, BYD partnered with the Environmental Defense Fund (EDF) Climate Corps program to accelerate in-house energy projects. The fellowship program brings together top talent, resources and expertise to help organizations meet their climate and energy goals.

EDF matched eight fellows – the largest cohort of fellows placed with one company in the program's history – with BYD to track and optimize its energy use.
Performance and production

originally beginning as a startup with 20 employees, BYD has grown to 240,000 professionals an enormous global presence. With production bases worldwide, the company’s physical facility footprint now totals over 18 million square meters. And it operates an extensive portfolio covering energy acquisition, storage and applications. So, you can imagine the amount of energy required to keep these operations running.

BYD sets annual company-wide energy-saving and greenhouse gas emissions-reduction targets to ensure its growth is not at odds with its mission to create a clean energy future. But, when it comes down to identifying and implementing the projects needed to achieve these goals, facility managers often find themselves stuck.

That’s where BYD saw a role for EDF Climate Corps: the trained fellows could provide the technical know-how needed to get facility managers in a position where they could make operational improvements as needed, and do so independently.

In the summer of 2018, EDF placed six Chinese graduate students within BYD plants across Shenzhen and Huizhou. On the other side of the globe, two more U.S. graduate students were placed with the company’s California facility. The idea was this: BYD could leverage the expertise of multiple fellows at once to drive down energy use and carbon emissions from manufacturing, and scale solutions across the company. If this model was successful, the solutions could then be replicated across BYD facilities worldwide.

Armed and ready, the eight graduate students set off to opposite sides of the globe to identify opportunities for upgrading and replacing equipment.

Improving efficiency and air quality in China

The six Chinese fellows were embedded into two BYD sites: a manufacturing plant for the passenger car division based in Shenzhen and an engine manufacturing plant located in Huizhou. Like other manufacturing facilities, these sites suffered from industry-wide issues of high energy use and substandard air quality. This created a two-part challenge for the fellows: reduce energy use in a way that also improves the working environment.

Shenzhen
Fellows began by analyzing the energy performance of various pieces of equipment in the electric vehicle assembly factory. After putting together a data inventory, they determined cooling and production equipment offered the most promising opportunities to reduce energy use.

The fellows presented facility managers with a suite of energy upgrades as well as a schedule for ensuring regular maintenance on equipment. They also recommended implementing new cooling methods that increase air ventilation and reduce air pollution, creating improved working conditions for employees.

Annually, these projects could together save 670,000 kilowatt hours of electricity and 350 metric tons of carbon dioxide emissions.

Huizhou
Unlike the Shenzhen plant, the engine-manufacturing plant had yet to make any significant investments in energy efficiency. So, the first step was determining just how much energy was being used. Fellows gathered and analyzed energy data to baseline the energy use of various systems. Using the new data inventory, they proposed a list of top energy-saving measures and project management solutions for lighting, air conditioning and the compressed air system, which alone is responsible for over half of the facility’s total energy use.

Over their project lifetimes, these recommendations could save BYD 1.3 million kilowatt hours of annual electricity and 700 metric tons of CO2 emissions.
Driving down energy use in California

While the six fellows were uncovering energy-efficiency savings in China, the two U.S.-based fellows were up against energy-related challenges of their own in Lancaster, California. Having recently been expanded, BYD’s Lancaster facility is now North America’s largest electric bus factory, spanning over nearly 450,000 square feet. But while the new expansion allows for top production-line capacity, it also requires more energy to operate.

On top of its expansive size, another cause of the Coach and Bus facility’s high energy demands is the extreme desert climate. Taking this into consideration, the fellows focused on operational efficiencies associated with temperature control. They recommended solutions ranging from implementing a heat recovery system for air compressors to putting the HVAC system on a timer to operate only when necessary.

Beyond the efficiency-focused recommendations, the fellows also developed a proposal for a two-phase solar development capable of meeting the full energy demand of the facility.

Over their lifetimes, the energy and solar projects together could save $3.2 million. Annually, they could save 5.8 MegaWatt hours of electricity, nearly 20,000 therms of natural gas and 2,600 metric tons of carbon dioxide emissions.

Scaling responsible, efficient operations

The energy-saving projects identified by the eight EDF Climate Corps fellows could help reduce BYD’s operating costs, provide better working environments for its employees by improving air quality levels and ultimately meet its greenhouse gas reduction goals.

About BYD
BYD Company Ltd. is one of China’s largest privately owned enterprises. Since its inception in 1995, the company quickly developed solid expertise in rechargeable batteries and became a relentless advocate of sustainable development, successfully expanding its renewable energy solutions globally with operations in over 50 countries and regions. Its creation of a Zero Emissions Energy Ecosystem – comprising affordable solar power generation, reliable energy storage and cutting-edge electrified transportation – has made it an industry leader in the energy and transportation sectors. BYD is listed on the Hong Kong and Shenzhen Stock Exchanges. More information on the company can be found at http://www.byd.com.

About EDF Climate Corps
EDF Climate Corps is a network of professionals united to advance climate solutions. The fellowship program brings together an arsenal of top talent, resources and expertise in a variety of subject matters and industries to help organizations meet their climate and energy goals.