

Chapter A-1: BETTER PLACE PHILOSOPHY

A-1-1. OVERVIEW

This chapter provides an introduction to the philosophy, values and fundamental beliefs that drive Better Place thought, activity and development. The following subjects are discussed:

- The global challenge
- The Better Place solution
- The economic opportunity
- Range extension
- Greater convenience
- Greater affordability
- Greater sustainability
- Core values
- Global SDO methodology
- Additional resources

A-1-2. THE GLOBAL CHALLENGE

Over the last 100 years, oil has fueled industrial development, mobility and prosperity for much of the world. Future progress, however, will be made possible by new sources of energy. The ever more apparent negative effects of carbon emissions are driving a new urgency to reduce, if not eliminate, oil-based transportation emissions.

Sustainable transportation for the mass market is a developing market that allows for energy independence, environmental restoration and new sources of economic growth. The development of renewable energy, the construction of a new infrastructure to support electric vehicles, and the efficiencies of electric power for transportation provide a significant opportunity. In addition, IEC international standards are helping the car industry accelerate the mass market adoption of electric cars.

A-1-3. THE BETTER PLACE SOLUTION

Better Place aims to shift the global transport paradigm from oil to electricity, and believes that countries can be weaned off of their dependence on oil. Better Place is not a mobility operator or a service provider, but an electric car network. “Network” is an umbrella term that includes:

- Physical infrastructure
- Backend software infrastructure that powers the intelligent information network
- Drivers who join the Better Place community

Better Place delivers services to enable the confident adoption and use of electric cars. It builds and operates the infrastructure and systems to optimize energy access and use, and works with ecosystem players to enable a compelling and integrated solution. Within the Better Place network, car drivers have access to a network of charge spots (CSs), battery switch stations (BSSs) and systems that optimize the driving experience and minimize environmental impact and cost.

A-1-4. THE ECONOMIC OPPORTUNITY

Over the past 35 years, global demand for oil has increased at an average of about 1% per year, despite periodic price surges and their effects on consumer budgets and national economies. Analysts identified \$440 billion in oil payments by the US in 2008 as the largest transfer of wealth in human history. Yet, global oil trade totaled nearly \$3 trillion in the same year. A shift to an electric transportation system based on renewable energy would inevitably result in a significant reduction in oil demand. Potentially, it would create one of the significant economic opportunities of the 21st century.

Expansion of renewable energy is just one opportunity for the creation and realization of value. Investment in components of electric cars, infrastructure and systems, including batteries, CSs, BSSs and grid technologies, provide opportunities. They also create a range of new construction, engineering and management jobs. No less significantly, the shift to electric cars provides an opportunity for transportation cost savings.

A-1-5. RANGE EXTENSION

Even as batteries and charging infrastructure improve, the use of electric cars for long journeys requires a way to quickly extend the range that the battery provides. Better Place provides this solution via a network of BSSs. A robotic system switches new batteries for depleted ones, cools and charges the batteries in inventory, and manages the logistics. It ensures that each car gets a fully-charged battery each time it arrives at a station.

At a BSS, drivers enter a lane and the station automatically takes over from there. The car proceeds along a conveyor. The switch platform below the vehicle aligns under the battery, washes the underbody, initiates the battery release process and lowers the battery from the vehicle. The depleted battery is placed on a storage rack for charging, monitoring and preparation for another vehicle. A fully-charged battery is then lifted into the waiting car. The switch process takes less time than a stop at the gas station and the driver and passengers may remain in the car throughout.

Better Place works with leading battery and vehicle manufacturers, like Renault, A123Systems and AESC, to develop lithium-ion batteries for cars. These batteries are high-performing, recyclable, environmentally-friendly and safe.

A-1-6. GREATER AFFORDABILITY

The Better Place solution offers protection from the unpredictability of gas price jumps and prices that are generally trending upwards. Better Place cars are more affordable than gas combustion cars and fixed-battery electric vehicles (FBEVs).

Due to the efficiency gains offered by electric cars and the stable cost of electricity relative to that of oil, electric cars deliver transportation cost savings to consumers. The per-mile or per-kilometer cost of transportation in an electric car (sedan model) can be up to 70% lower than that of a gas-powered one in some markets, even when factoring in the amortized cost of the battery.

The Better Place solution takes the cost of battery ownership off of the owner's personal balance sheet. It reduces both the expense and technological risk of battery ownership. In contrast to other electric cars, Better Place's battery switch model allows members to swap

their current batteries for better batteries that may become available in the future. In addition, in-car software is updated remotely on an ongoing basis.

A-1-7. GREATER CONVENIENCE

To enable the broad adoption of electric cars, a concerted effort must be made to provide convenient charging where it is required. This includes homes, offices and public areas. Electric cars need to deliver the same freedom to go anywhere that drivers of combustion engine cars enjoy today.

Better Place develops, installs and manages large networks of CSs that give consumers the convenience and services they need to make the transition to electric cars. Every Better Place member wakes up every day to a “full tank.” With a CS at home, there is no longer a need to go to stations on a regular basis. In addition, members gain access to a network of CSs, which are easily located through the in-car system.

For long distance driving, the battery switch model allows for instant 160 km range of extension. Better Place offers the only solution for electric cars that allows electric car drivers to go long distances without the wait involved in recharging.

A-1-8. GREATER SUSTAINABILITY

In our current system, 98% of transportation is powered by oil products. A transition to an electric transportation system based on renewable energy sources would benefit both transportation and renewable energy.

Only 2% of global electricity (and an even lower percentage of transportation energy) is currently generated by non-hydro renewable sources. An electric car system takes advantage of underutilized electricity, providing resources for renewable development. Electric cars can alleviate the problems of intermittency, unpredictability and off-peak generation that have hindered the progress of renewable energy in the past. In addition, because electric cars offer energy efficiency that is up to three times greater than that of gasoline-powered vehicles, they reduce the overall burden on energy resources.

Denmark, for example, presents a strong case for the economics of the transition. Denmark’s wind farms generate electricity at variable rates caused by unpredictable changes in wind patterns. The wind farms generate much of their electricity at night, when winds are high but demand for electricity is low. If a critical number of cars are plugged in at night, they collectively serve as a distributed energy storage device that absorbs renewable energy as it become available, which then powers transportation the following day. Denmark’s DONG Energy estimates that the country’s entire fleet of 2 million passenger vehicles, if replaced with electric cars, could run on fewer than 750 windmills. This is about 60% of the country’s current installed wind capacity.

A-1-9. CORE VALUES

Better Place places safety at the core at everything it does. Quality, integrity and the environment are the guiding principles of the company’s activities.

Better Place believes in careful handling of the details of execution, in order to create an outstanding user experience. Operational excellence is the basis of the company’s activities.

Better Place knows that people are its key asset. The company values its customers and keeps their needs in mind in everything that it develops. Better Place views its solution as a means for people to improve their own lives and the world.

A-1-10. GLOBAL SDO METHODOLOGY

This Better Place methodology for the global deployment and operations of network infrastructure is designed to enable and support the company's purpose, vision and objectives. The methodology defines standard processes, support systems, tools, control mechanisms and organizational structures. Several basic principles drive the definition of this methodology:

- Aligning global and local program objectives with Better Place's core ideology
- Eliminating health, safety and environmental hazards during the infrastructure life cycle
- Optimizing the total infrastructure life cycle
- Partnering with suppliers committed to Better Place's purpose, vision and values
- Developing optimal commercial relationships and compensation models
- Adopting a culture of continuous improvement with robust processes, systems and tools

A-1-11. ADDITIONAL RESOURCES

Additional information about this topic is available on the SDO portal (<http://portal/SM/SDO>).