



Better Place - the other story: Energy Storage

Hugh McDermott
October 2010

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Outline



- Snapshot of Better Place solution
- Smart charging overview
- Energy storage elements
- Global progress update

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Better Place model addresses EV adoption barriers



Customer Need		Solution
Ease of use		Better Place installs personal and public charge spots making it easy to charge up wherever you are
Extended range		Battery switch stations to provide fully charged batteries on long distance trips
Affordability		Better Place pays for and owns the battery, reducing upfront cost and technological risk; customers pay an affordable monthly fee
Positive ownership experience		Energy you need every morning, zero emissions driving satisfaction
Energy supply		Smart charging management aligns electricity supply and demand with electricity system constraints

Better Place solution elements



At home and out and about: Charge spots and Battery switch stations



Access to charging when and where you park

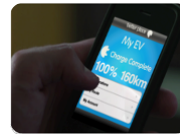
Ability to drive long distances by providing fully charged batteries on the road



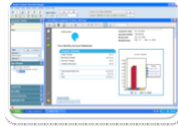
In hand, in the car: Driver services



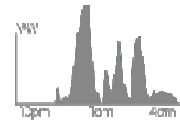
In-car and remote access to your EV's energy information, trip planning and other services



Behind the scenes: Managed EV services



Working with utilities and customers to monitor and manage energy supply and demand

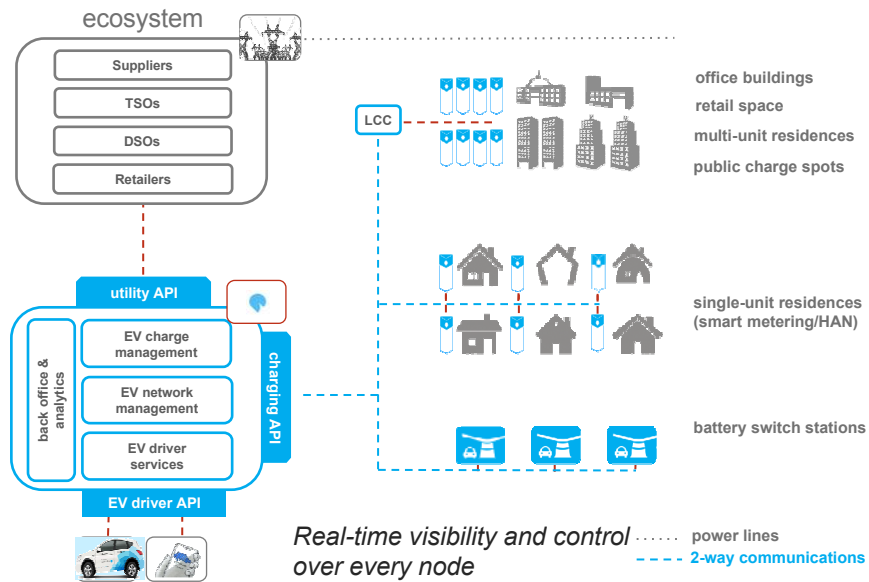


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Better Place EV charge network



EV charge network features

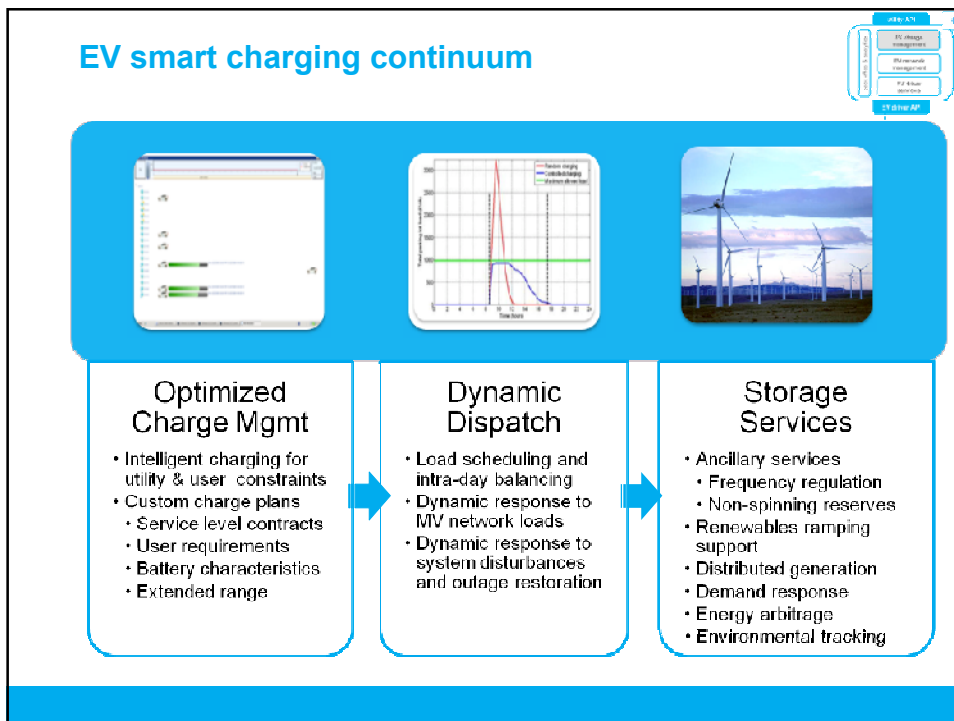
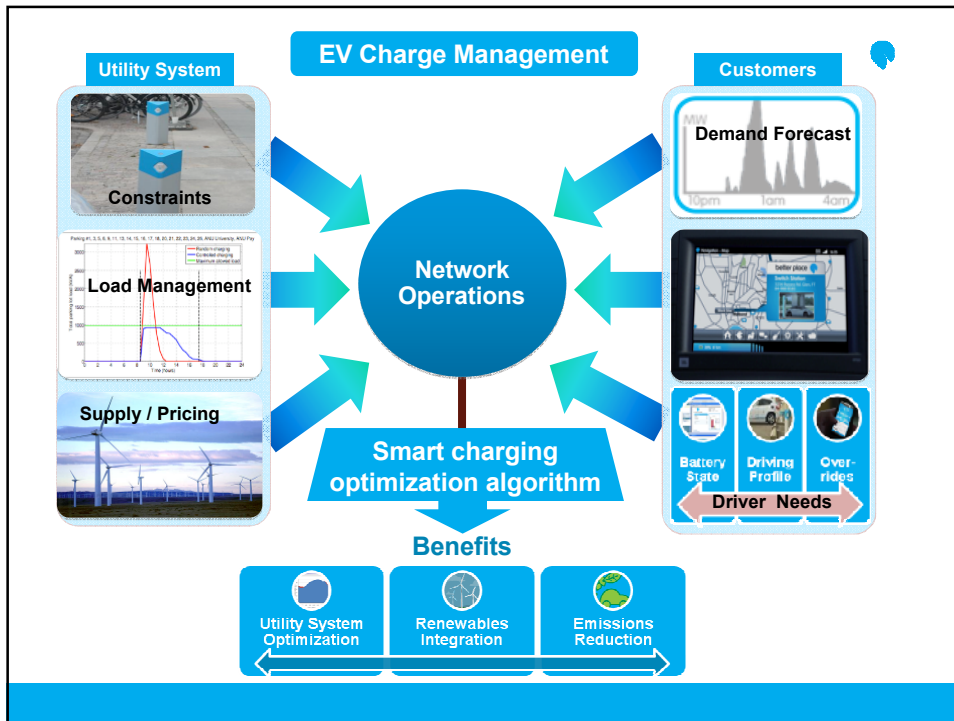
Dynamic dispatch enabled by:

- Real-time communication with car/battery (via AutoOS)
- Real-time communication with every CS (wi-fi, cellular, fixed line)
- Ability to regulate rate of charge at CS
- Local communication controllers for CS clusters

Supply Management

- Energy use profiles (vehicle, CS, zones)
- Day-ahead forecasting
- Intra-day balancing (hour ahead; 15 min ahead etc)
- Load scheduling and commitment

Enables storage & ancillary services



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Better Place energy storage assets



CS represent networked battery asset

- Up to 5+ MW of dispatch-able load for every 1,000 Evs
- Fast “ramp” response

BSS are similar to distributed generation and stationary storage

- Always “on”
- Up to 1MW output per BSS (not including stationary storage)
- Ability to ramp power up/down; Bi-directional energy transfer
- Low/no marginal cost to operate
- Multi-mode capable (FR, DR, capacity)

Network Operating Center provides centralized control

- EV network charge optimization
- Data collection and analytics (forecasts, load commitments)
- Area control capability
- Coordinate storage service delivery (FR, DR, ramp support, etc.)

BP energy storage assets & smart charging creates new opportunities

Generation



Energy Arbitrage
Renewables Integration
Deferred investment

Transmission & Distribution



Frequency Regulation
Congestion
Dynamic load control
Demand response

End-Users



Load shifting
Distributed generation
Micro-grids
New energy solutions

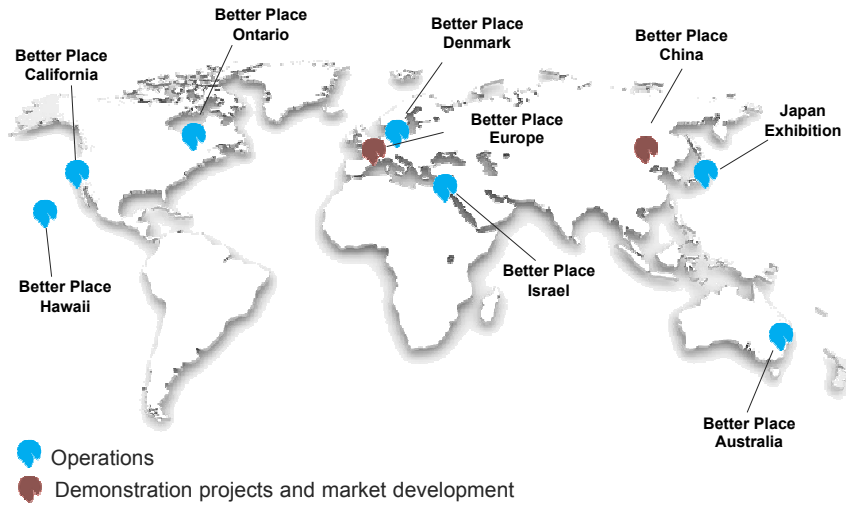
Key requirement for success: Partners

- Suppliers
- Traders/marketers
- Generation & transmission asset partners
- Demand response
- Others?

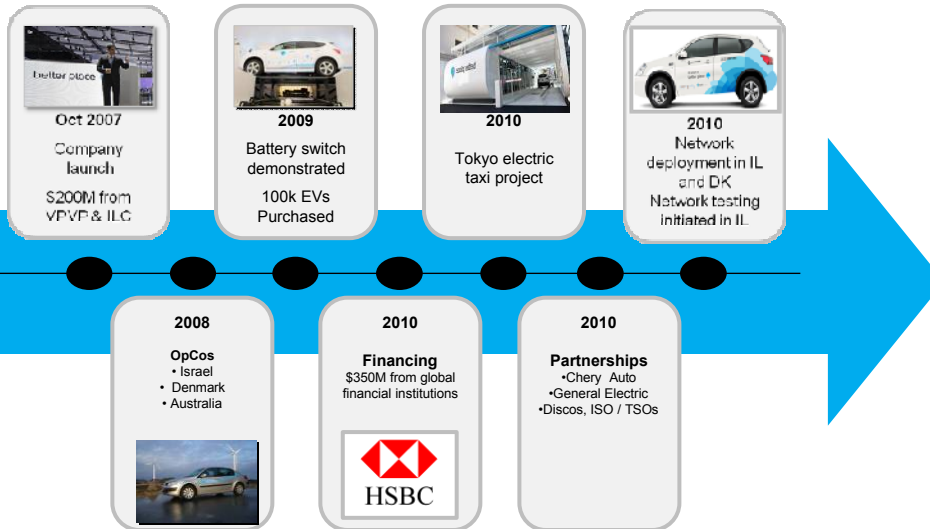
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Better Place global activities



global progress timeline



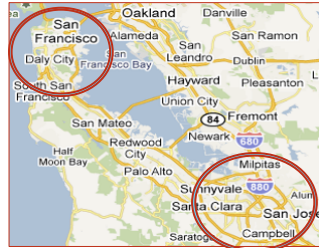
Highlights for 2011



North America

San Francisco Bay Area Taxi Project

- 1st North American linked EV corridor providing 24-7 EV operations
- Grid-integration energy storage demo leveraging BSS



Ontario EV Demonstration

- Multi-utility EV smart charging

Global

Israel

- Go live! Full network operations and arrival of first switchable EVs
- Full integration with utility partner

Denmark

- Full network testing commences

Australia

- Smart Grid -Smart City demonstration



Go Giants !



better place 