Testimony of Jason Wolf
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Subcommittee on Energy & Environment

Hearing on "Clean Energy Policies That Reduce Our Dependence on Oil"

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Good morning, Chairman Markey, Congressman Upton, and members of the Committee. My name is Jason Wolf, and I lead Better Place North America. As you may know, Better Place is the world's leading global provider of electric vehicle networks and services, and our mission is to end dependence on oil.

Thank you for the opportunity to speak with you on the critical issue of how the US can solve its dependence on oil by leading the global transition to electric vehicles (EV's). And why it is imperative we do so *now* to grow our economy.

Two years ago, our Founder and our global CEO, Shai Agassi, came before you and said that the US was at a critical juncture. He described the choice for our country. Between continued reliance on a single, strategically vulnerable energy source – petroleum – to fuel more than 95% of our transportation. And an alternative path of a rapid transition to electric vehicles that is imminently feasible with technologies available today.

Sadly, two years later the US remains paralyzed at that same juncture.

Now, there are signs of progress. The Recovery Act has planted the seeds of much needed investment in automotive retooling and scaling battery manufacturing, but as I will discuss, these two elements alone are not enough to succeed.

And in the last two years, much of the rest of the world has begun to move in a faster and more comprehensive way to lead in electrification.

For example, in 2008 Israel had just made a national commitment to end its dependence on oil to protect its national security. Two years later, Israel has seen private investment flow into development and deployment of clean technologies, and Israel's economy is booming. In two more years, Israel will have the world's densest operational network of electric vehicles.

And this pales in comparison to the aggressive commitment China is making to leapfrog the combustion engine to electric vehicles, as it is doing with landlines to cell phones. A front-page headline in the New York Times told it last year, "China Vies to be World's Leader in Electric Cars." As we speak, automakers in the Beijing Auto Show are displaying their mass production electric vehicles, including battery switch technology.

We all know why it is imperative the US address its dependence on oil. Electrification of transportation is the only plausibly scalable way to get there at present. But even more importantly – electrification is now globally inevitable.

So the only question before you today is – will the US lead this transition or will we lag behind China, Japan, France and others in capitalizing on this economic opportunity? Entirely new industries with the potential for millions of new jobs hang in the balance.

Better Place global progress

I'd like to take a moment to update you on the progress of my company, Better Place.

As background, Better Place is a leading electric vehicle services provider accelerating the global transition to sustainable transportation. Better Place is building the charging infrastructure and intelligent networks to deliver a range of services to drivers, enable widespread adoption of electric vehicles, and optimize energy use. We work with all parts of the transportation ecosystem, including automakers, battery suppliers, energy companies, and the public sector, to make EVs affordable and desirable. Based in California and privately held, Better Place has operating companies in Israel, Denmark, and Australia.

Better Place's business model is to enable electric vehicles on mass scale by removing the 3 key barriers to adoption: cost, range and convenience. We do that by:

- Providing an intelligent network of charging infrastructure, including charge spots and an "instant charge" option through the battery swap for range-extension.

- Making the EV competitive with the gasoline car by eliminating the upfront cost of the battery and selling clean e-miles to the customer on an on-going basis.

- Optimizing the energy use of electric vehicles for the customer and the grid, while managing the life of the battery.

Our path is not a science experiment – it is based on integrating proven technologies that are here and now (see Figure 1). As a validation of our business, in the past two years we have raised over $700M in private investment from leading financial institutions – like HSBC, Morgan Stanley, Lazard Capital and others.

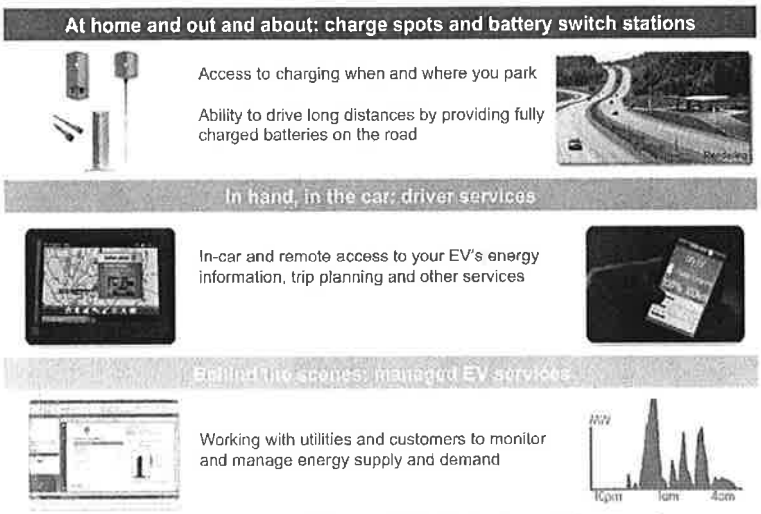

Figure 1: Better Place EV Solution Elements

In the last two years, we have also deployed more charge spots in Israel than have been deployed across the entire US over the same time period. And we have reached agreement with Renault to bring 100,000 switchable electric vehicles to **Israel and Denmark** over the next several years.

Besides Israel and Denmark, we've established operations in Australia, US, Canada, Japan, and most recently China and France.

In **France,** which has committed $2B to EV infrastructure, we will demonstrate the battery switch as part of a project by Renault-Nissan, EDF and others to demonstrate carbon-free transportation.

Just this week, Better Place unveiled the world's first commercial demonstration of electric taxis with switchable batteries in **Tokyo, Japan**, developed in partnership with Japanese Ministry of Economy, Trade and Industry, and Tokyo's largest taxi operator (Figure 2). Electric taxis are at this hour ferrying passengers around Tokyo, operating non-stop except for a few minute stop every 100 miles to switch batteries at our station.

Figure 2: Tokyo battery switchable electric taxi commercial demonstration

Even though taxis account for just 2% of total passenger vehicles in Japan, they are responsible for 20% of overall passenger-vehicle emissions, and they typically travel ten times the number of miles as the average Japanese passenger vehicle. Therefore, converting to electric vehicle taxis provides a concrete solution to reducing CO2 and urban pollution for a small, but high-emitting segment of vehicles.

Also just in the last few days, Better Place has announced collaboration with Chery Automobile, **China's** largest independent auto manufacturer and exporter, to prototype battery switchable EV's. The announcement took place at the Beijing Auto Show, where several major Chinese automakers displayed their EV's with a battery switch.

Figure 3: Beijing Auto Show displays of battery switchable electric vehicles.

By the end of 2010, Better Place will test all components of its solution in Israel as we continue to gear up for commercial launch in Israel and Denmark in 2011. The complete Better Place solution integrates charge spots, in-car software, operations centers, cars, and batteries, in addition to switch stations, all managed as an intelligent network.

These are some of the signs of the disruptive innovation and competitiveness that will come from countries making a serious commitment to electrification.

Now, let's look at what this means for the automotive future.

Global trends indicate electrification is inevitable

As to what comes after oil, the issue is settled. The future of the vehicle is electric. That is not just our view. That is the nearly unanimous consensus across the global automobile industry today.

As Bill Ford stated publically two weeks ago, "the electrification of the US fleet is inevitable." Similar statements have been made by automotive executives from GM, Renault-Nissan, BMW and others. So the question is no longer if, but when and how fast the transition will take place, and who will lead that transition.

What's critical to understand is this global momentum is being led by governments that have made *the choice for electrification,* and followed through with policies to enable this transition.

The primary motivations for each country differ – from oil independence, to building globally dominant automotive industries, to integrating large amounts of renewable electricity into the grid.

But the conclusion is the same. Electrification enables all of these benefits, if it is done at scale.

One the one hand, there are countries that for security or environmental reasons have the economic and policy signals in place.

- For example, Israel and Denmark have priced gasoline at $6-7/gallon and have set taxes on combustion engine cars that are higher than electric vehicles.
- With 20% of its electricity generation coming from wind, Denmark is looking at electric vehicles as demand and storage potential to support excess renewables generation, which is otherwise sent at a loss to other markets.

On the other hand, there are large industrial economies that look to dominate the global automotive industries, such as France and China.

- China has made electrification a top national priority, setting an industrial policy with the goal of becoming the global leader in manufacturing and deployment of EVs, moving from less than 3% today to capturing over 30% of the global market by 2020.
- With foreign oil imports expected to reach 65% of China's consumption by 2020, China is moving aggressively to turn an economic and national security liability into a global economic opportunity.
- To achieve it's goal, China is funding a 13-city demonstration to test mass-adoption electrification models.
- And it is providing an $8,800 rebate for consumers to purchase EV's.
- France is also leading, with $2B committed to funding EV charging infrastructure and funding for large-scale demonstration projects.

Unfortunately, the US is stuck somewhere in the middle, with no clear policy direction and insufficient economic signal to drive *private investment* into electrification.

We've been here before. After the oil crisis of the 1970's, we allowed Japanese automakers to emerge as the global leaders, and dominate the last three decades with high quality, fuel-efficient cars.

Now we are seeing the same trend shaping up with China's emerging dominance in cleantech. Recently, John Doerr, one of the leading cleantech venture capitalists, framed this trend by looking at the top 10 companies in solar, wind, and battery technologies. Out of the 30 leading companies only 4 are US-based.[1] Furthermore, Doerr stated that China has grown

[1] Green Economy Coming Faster than Expected: http://techpulse360.com/2009/11/18/green-economy-coming-faster-than-expected-john-doerr-says/

its solar PV share of the global market from 2% to over 40%, while during the same timeframe the US has moved from over 40% to about 16%.[2]

Let's look at what is happening with cars in China today. With only 2% of China's population owning cars and 80% of sales in 2009 to first-time car buyers, China has the opportunity to create and lead an entirely new category around clean transportation. According to HSBC research, China's share of the global EV market will grow from 2.7% this year to 35% by 2020.

To keep pace with the world and have the potential to lead, the US needs a clear national commitment to electrification and the policy to support it on mass scale.

In fact, sustained economic growth cannot return *until* we have disconnected our economy from oil. As a University of Michigan economist, Lutz Killian, told the Financial Times this month, "You can't have a global recovery without the price of oil recovering as well. The only way to keep oil prices down is to remain in recession which hardly sounds attractive." So succeeding in stimulating economic recovery will mean a return of triple-digit oil prices that could then drag the economy back into slow growth or recession. And in the past 12 months, we've seen oil prices rise by 70% to reach over $85 last week.

The only permanent fix is to disconnect the transportation sector, and thus the economy, from oil dependence. This also happens to be the only permanent fix to ills as diverse as our trade deficit, global warming emissions and national security.

Last week, an oil platform exploded and sunk in the Gulf of Mexico, which, aside from being a tragic loss of life, also illustrates the ever-increasing difficulty in accessing oil. We have to ask ourselves – what will be the stimulus cost next time we have a major oil price spike? Wouldn't it be more diligent to invest a fraction of that today on a "cure"?

Domestic manufacturing jobs depend on the creation of an EV market in the US

In the last two years, the US has made a $2B investment in battery technology through the Recovery Act, and billions more for automotive retooling. The only way to ensure that investment pays off for taxpayers and creates the long-term growth and jobs in the automotive sector domestically is to create mass-market demand for electric vehicles.

According to Johnson Controls Inc, if market demand for electric vehicles in the US is not catalyzed in the near-term, between 2010-2015, domestic capacity in vehicle units will exceed demand by about 1.35 million units by 2015, a gap of 62%. Globally, the demand vs. capacity gap for batteries and electric drive components manufacturing would be about 48%.[3] If the US is to see long-term jobs growth in manufacturing, then we need to create the domestic markets to sustain these products.

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[2] China beating US cleantech: http://blogs.wsj.com/dispatch/2010/03/04/doerr-china-beating-us-in-clean-tech/

[3] Testimony of Mary Ann Wright, Johnston Controls Inc, US Senate Committee on Appropriations Energy & Water Subcommittee, February 23, 2010.

Electrification gives new momentum to our automotive industry. All we have spoken of for the last decade is how Detroit has to "downsize" to be competitive. In a world where the global car park is expected to double in the next decade and a half, there is no reason the US automotive industry should have to downsize. Instead, let's help it build the cars for the post-oil age.

US needs a national commitment to electrification on a mass scale

The only alternative to gasoline that is commercially viable today is electrification. It is also one of the single most effective steps we can take toward a low carbon economy.

Mr. Chairman, you often express your frustration with those who keep their head in the sand and deny the scientifically proven fact that manmade pollution is contributing to changing the earth's climate.

Mr. Chairman, let me say I feel the same frustration when people express the view that electrification of transportation represents "choosing" one technology over another.

Electrification breaks the stranglehold of petroleum in the transportation sector and opens up a full menu of power sources, including zero-carbon resources. In fact, based on our experience in Israel, Australia and particularly Denmark, I would assert that the notion that we have to first clean the grid before we can bring electric cars is exactly backwards.

As we see it, electric cars enable the scaling of renewable electricity — once widespread, distributed, centrally managed and cost-effective storage is available, then you will see private investment flow into renewable generation on an order of magnitude we have not seen to date.

As FERC Chairman, Jon Wellinghoff, has described: "Electric vehicles, deployed in mass volume, and unmanaged represent a tremendous threat to the stability of the grid. Electric vehicles, deployed in mass volumes and intelligently managed by a utility or network operator represent a huge opportunity to add grid stability and versatility, and exploit the storage capacity to stimulate private investment in intermittent renewable electricity."

That is why electrification should not only be a top national security and economy priority, but a centerpiece of our energy and climate policy as well.

Mr. Chairman, thanks to your leadership and that of others on this Committee, the energy and climate bill passed in the House contained important first steps that would start us on the road of a national investment in electrification, including the creation of a DOE program to fund regional electric vehicle infrastructure deployment and demonstration.

We commend your leadership on this issue, and we offer the following recommendations to move us forward with a concerted national effort on electrification.

Policy recommendations

If the US were able to price gasoline in concert with the security, economic and environmental impacts of petroleum dependency, private capital would easily flow to mass-market solutions for transportation.

We have not been able to so as a country.

As a result, we must put focused support and investment behind electrification on a mass scale. We can do that by:

(1) **Setting a national electrification policy to signal the market and provide coherent policy direction toward mass-market adoption of electric vehicles.**

By setting an *explicit US policy in support of electrification*, we can unleash private investment and guide the market beyond technology development to meaningful commercial deployment of electric vehicles and infrastructure.

(2) **Investing in multi-regional electric vehicle ecosystems, with the explicit goal of proving out mass-market models that can support EV adoption at scale.**

A number of DOE programs have been proposed to develop regional EV demonstrations, including in the Waxman-Markey bill, the Senate energy bill, and the Electrification Coalition roadmap.

We agree with the approach of building out regional ecosystems. However, to ensure the investment leads to successful larger-scale deployment, the program should be *aggressively aligned with mass adoption as the goal*.

Additionally, our experience globally shows us that third party operators have a critical role to play in enabling EV adoption, and should therefore be recognized in the policy framework. Ultimately, the cost of going electric will be much lower if private entities are allowed to play in this market with innovative business models that break down the barriers to EV adoption.

(3) **Continuing to bolster consumer demand for EV's by ensuring the current $7500 EV purchasing tax credit scales to the rest of the US consumers**.

To further support EV adoption, the tax credit should be extended and provided as a rebate directly to consumers. With incentives and infrastructure in place, electric vehicles can be made a cost-effective, desirable alternative to the gasoline car.

Thank you, and we look forward to working with you to put the US on a path of leading the global transition to electric vehicles.