

Electric Car UI Considerations



Krispin Leydon, Tesla Motors
University of Limerick - Oct 2008

Outline

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Intro to Tesla

Early Experience

Ambitious Plans

Enabling Edge

Drivers, Needs, Touch Screen UI

E.V. Differences - In Use

A Sound Design Challenge

Intro to Tesla Motors

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Car Company, producing
the Tesla Roadster:

- 0-60mph in 4 seconds
- 2X the Efficiency of Prius
- Zero emissions
- 220 miles per charge
- Less than 2 cents/mile



Background

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At turn of 20th century...

- 38% of cars electric (22% gasoline, 40% steam)
- Fastest cars were electric
- Popular through 1920s
- Henry Ford's wife *preferred* her electric car

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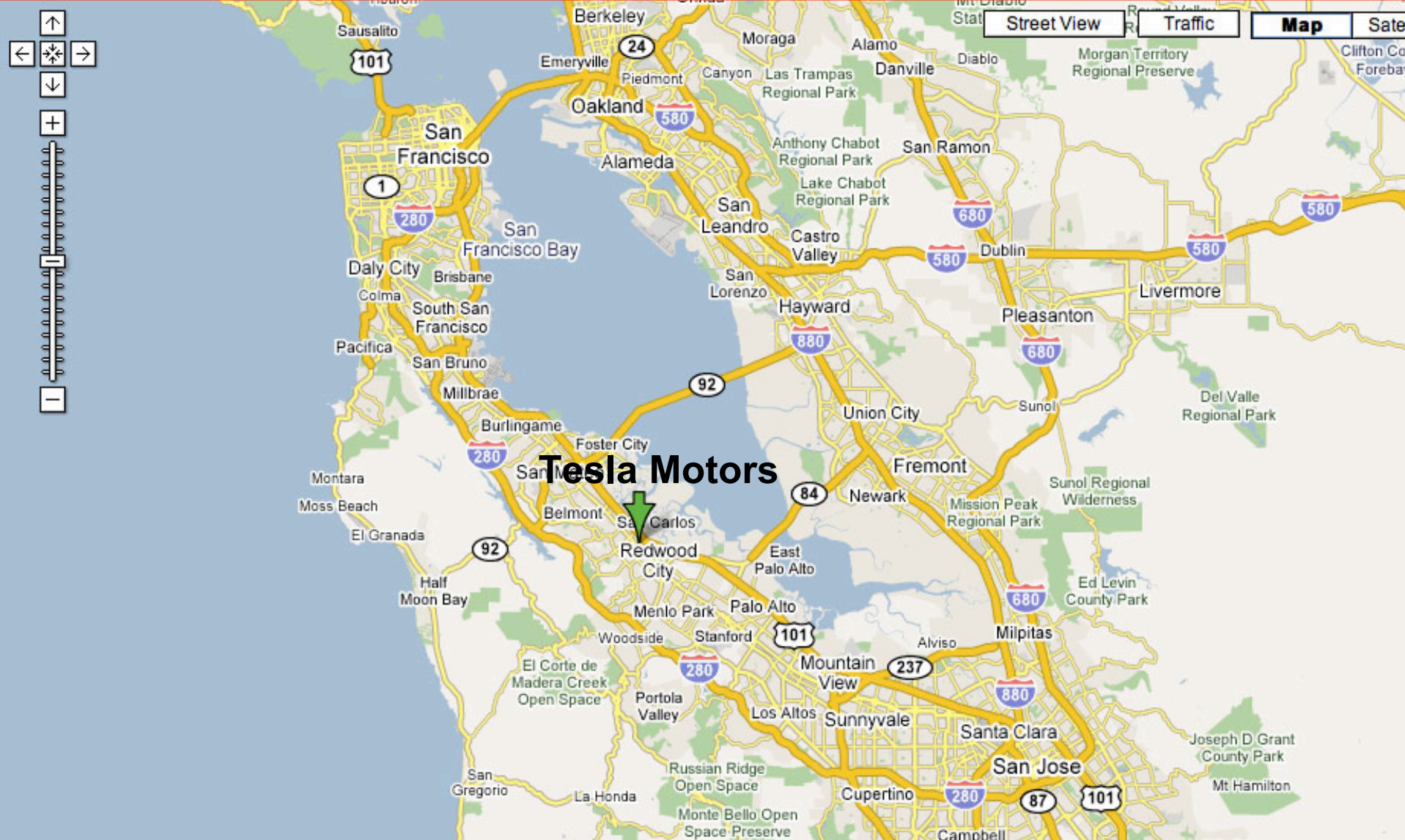


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www.teslamotors.com

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Early Experience

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Mission & Motivations

Mission & Motives

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Become the next great
American car company

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Accelerate change in
automotive industry

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Chevy Volt



Mission & Motives

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- Make a dent in global warming
- Reduce oil dependency
- Do *well* by doing *good*
- Tribute to Nikola Tesla

What makes an electric car
company possible today?

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1. Start at the Top

First introduce a superior product. *Then* reduce costs for the mass-market.

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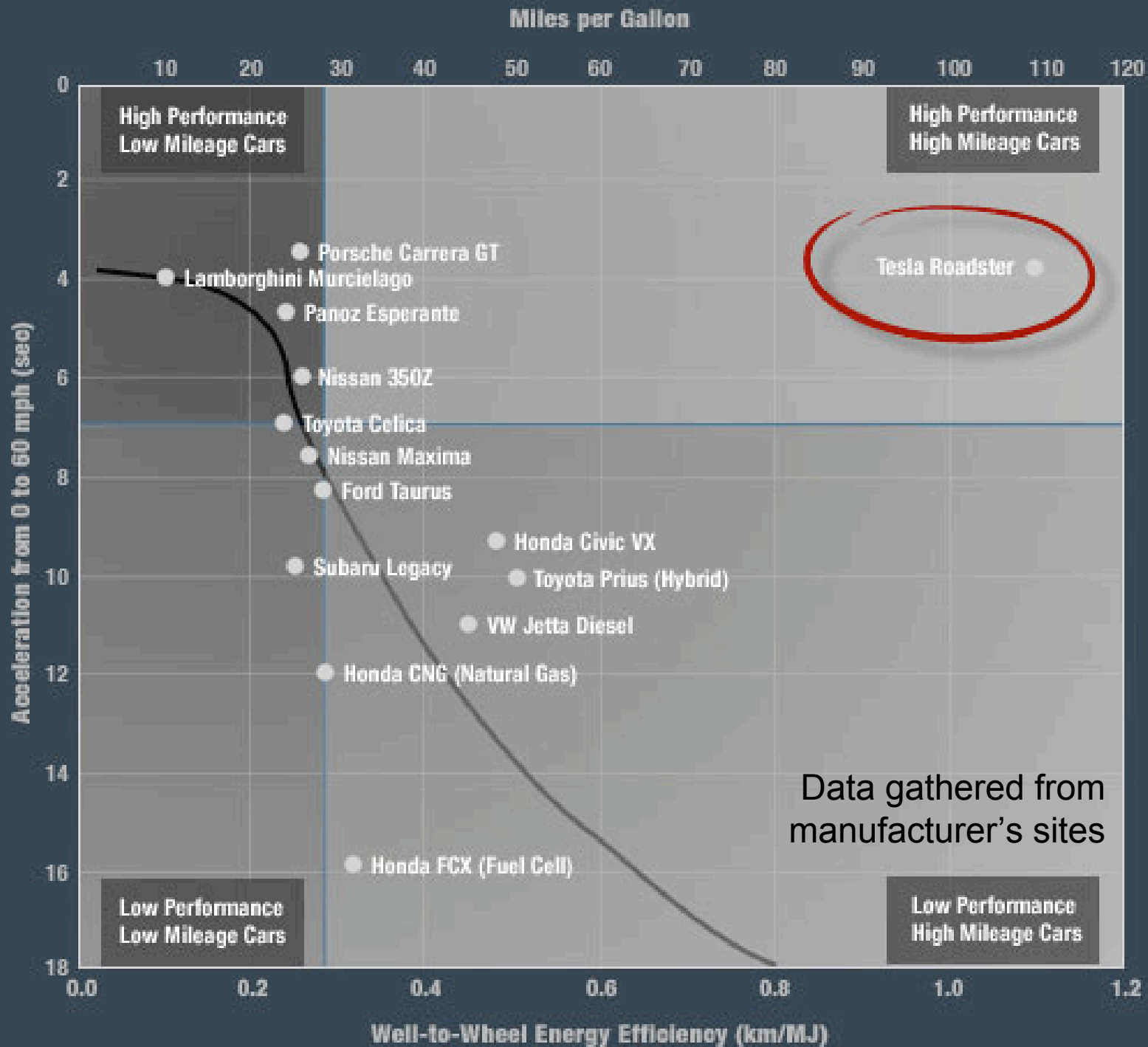


CW from top:
NmG, Myers Motors
Tango,
Commuter Cars
Xebra, Zap!
ForTwo, Smart

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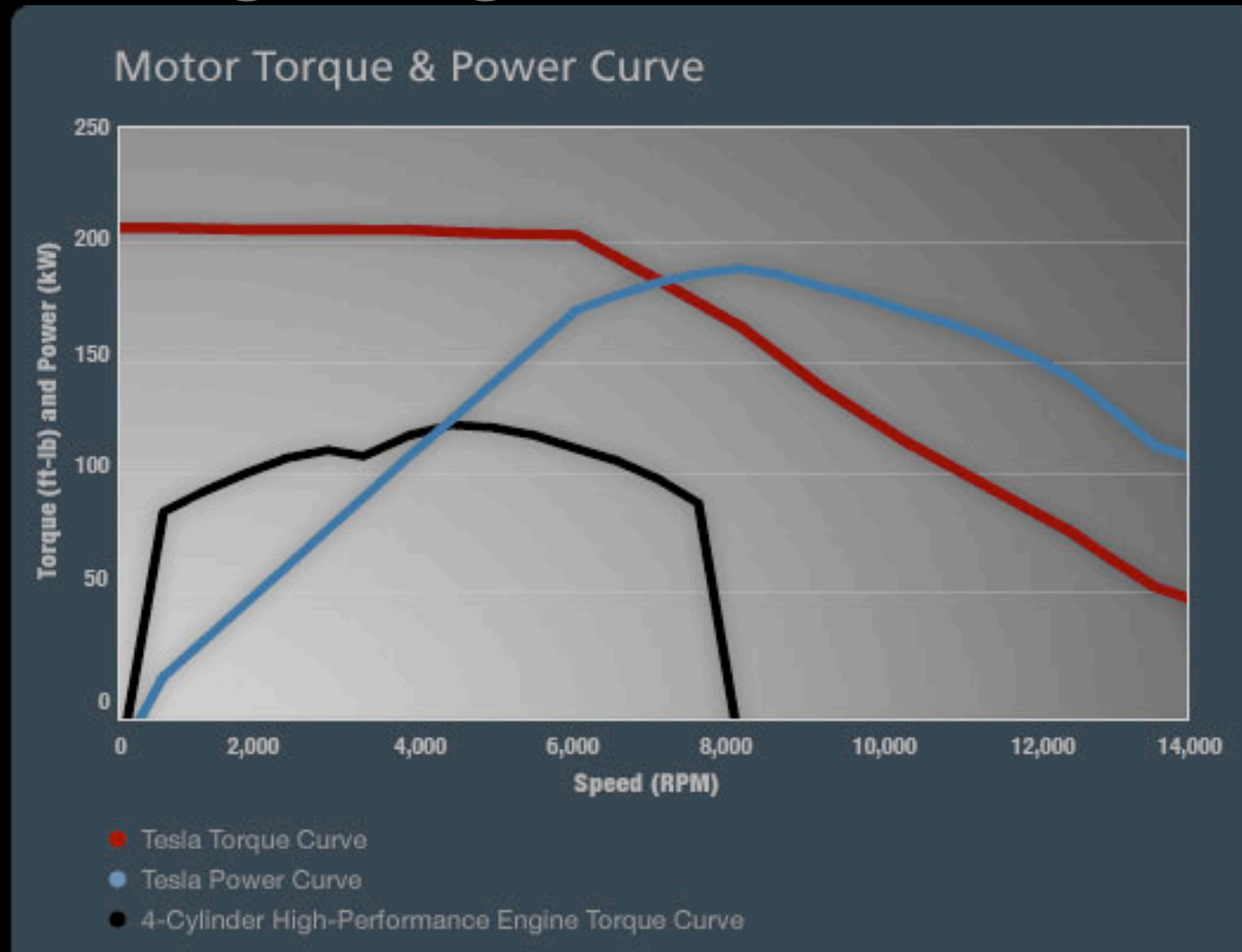
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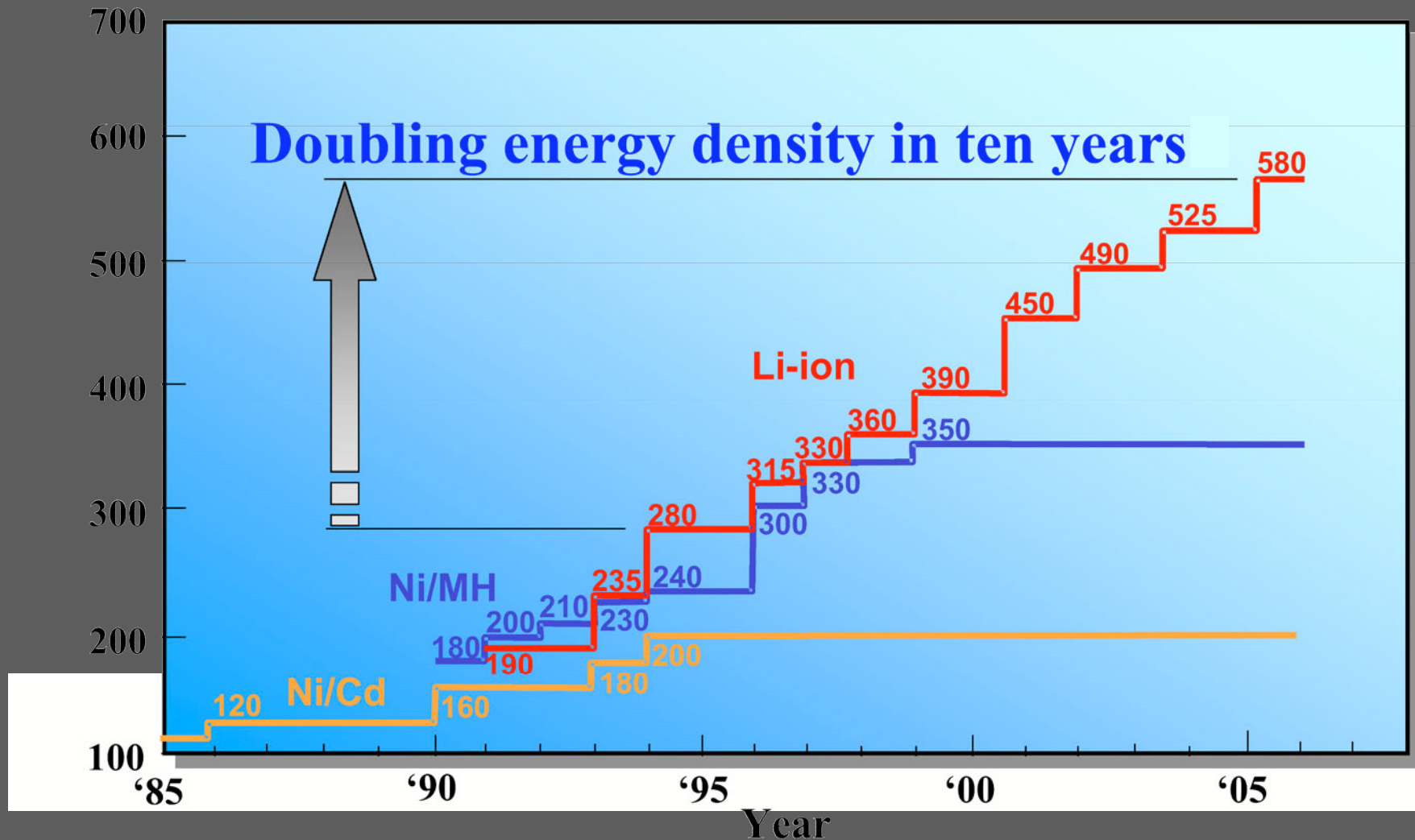




2. Leverage existing market pressures

Use commodity laptop cells, benefit from advances & cost reductions achieved by the laptop industry.

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Source: Panasonic presentation at Florida Educational Seminar, March 14th, 2006

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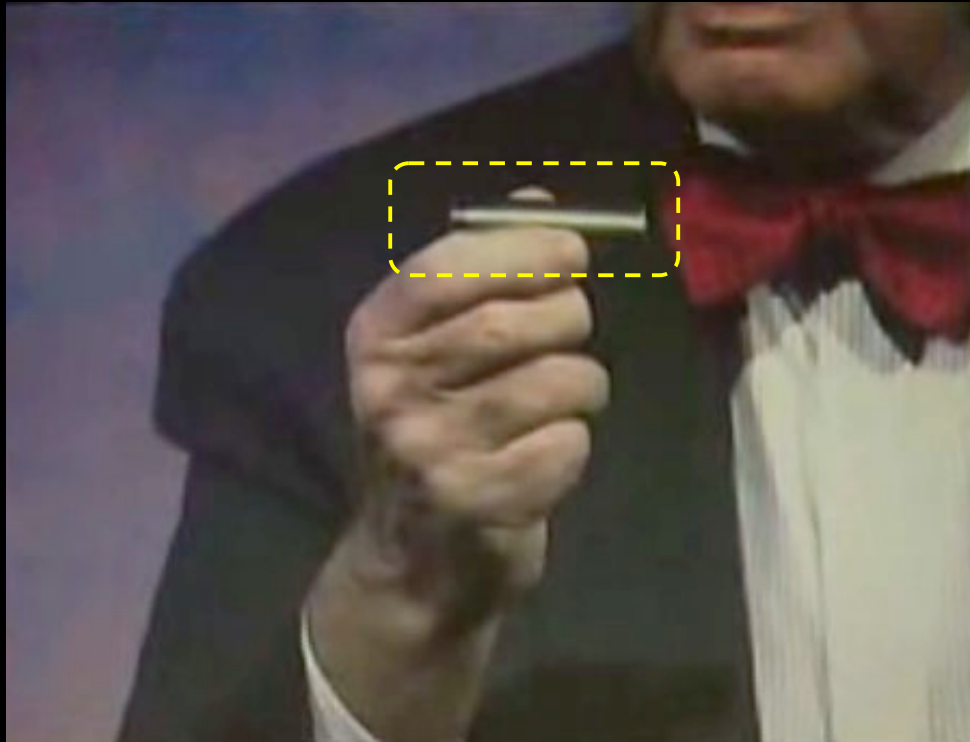
Falling Cell Prices

Institute of Information Technology, March 2006



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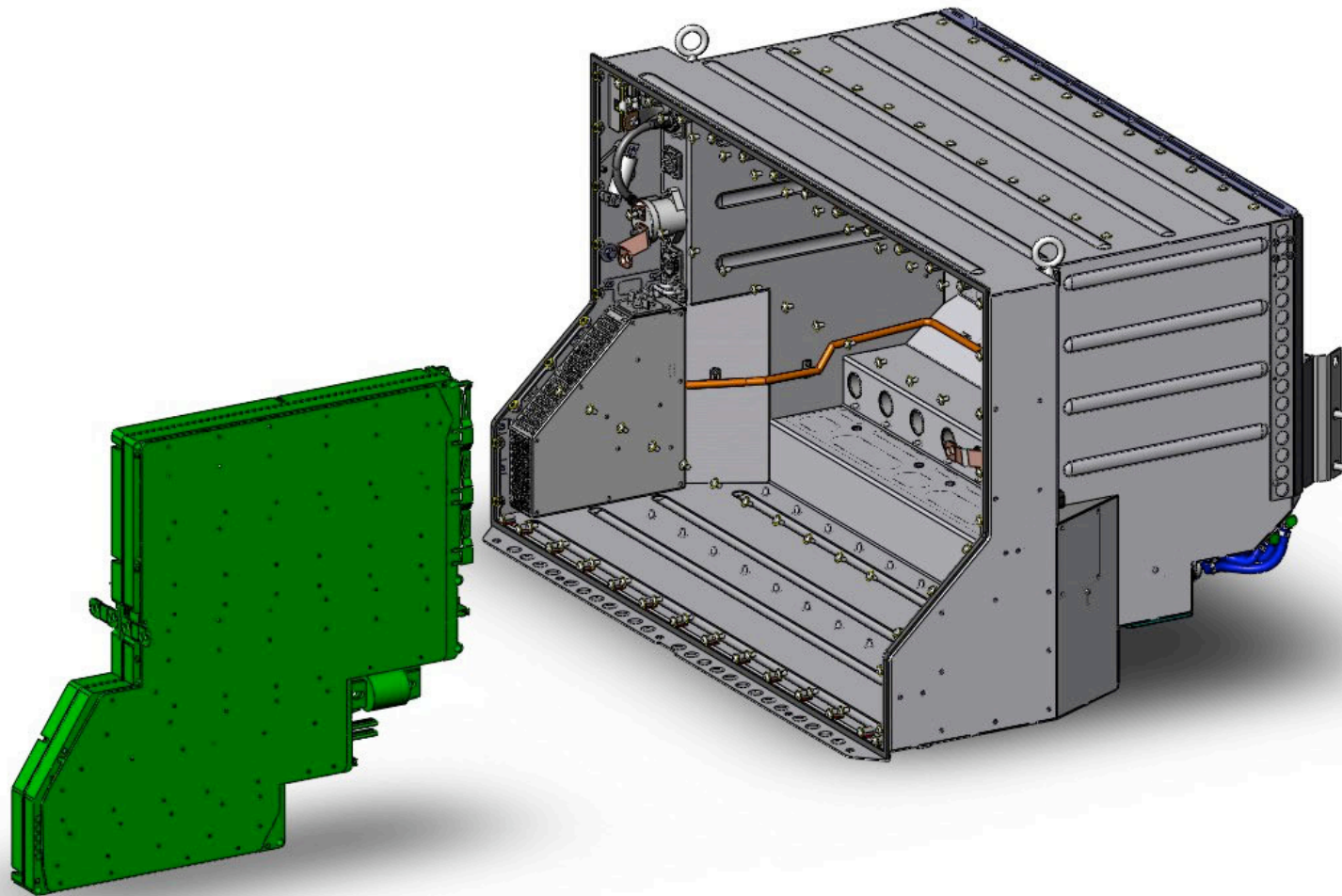
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X 6,831

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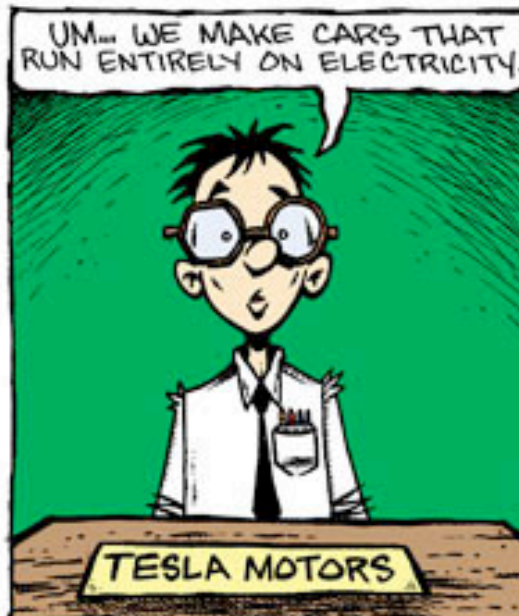
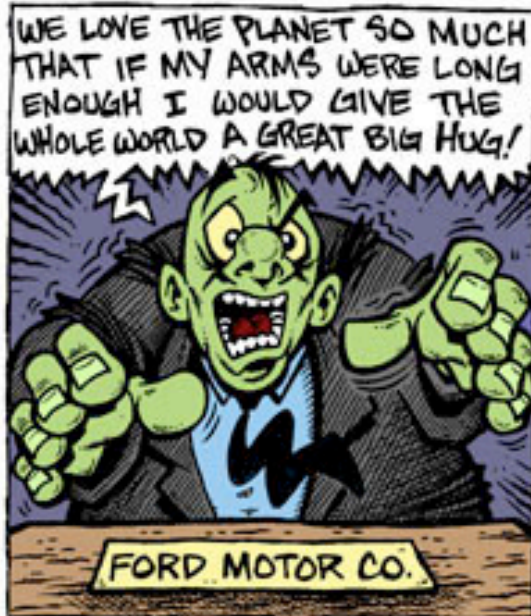
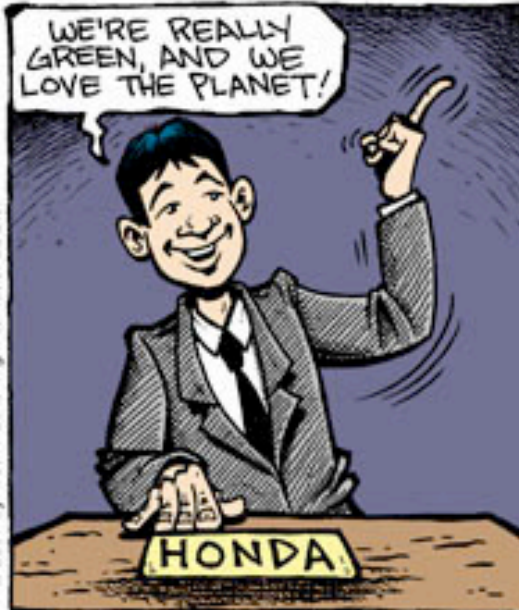
Motor



3. *Understate* Environmental Benefits

Let your products speak for themselves, avoid “green fatigue” and environmental backlash.

COUNTERTHINK "GREENBOASTING"



FACT: CAR COMPANIES TALK GREEN, BUT THEY KEEP SELLING DIRTY CARS THAT BURN OIL.

PLUG-IN ELECTRIC VEHICLES ARE THE SOLUTION. VISIT

WWW.PLUGINAMERICA.COM

WWW.NEWSTARGET.COM

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Toyota Prius Screen Spoof - Found on the Web

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4. Bypass Traditional Manufacturer / Dealership Relationship

Avoid an entrenched conflict
of interests

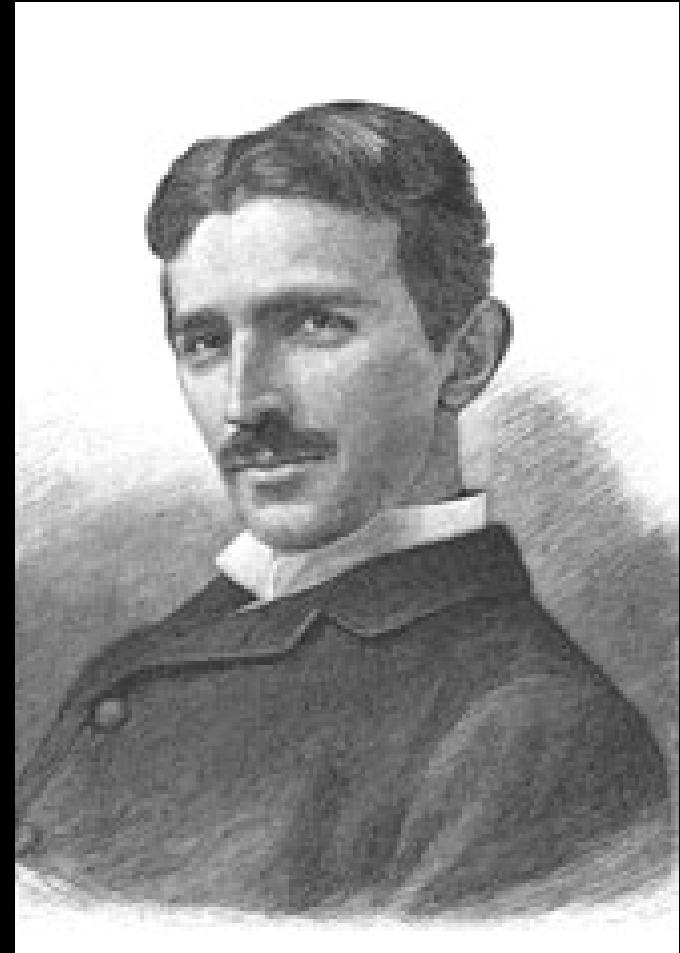
Timing

Timing

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2006: Year of
Nikola Tesla
(UNESCO)



Timing

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an inconvenient truth




Timing

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IN 1996, ELECTRIC CARS BEGAN TO APPEAR ON ROADS ALL OVER CALIFORNIA. THEY WERE QUIET AND FAST, PRODUCED NO EXHAUST AND RAN WITHOUT GASOLINE.

TEN YEARS LATER, THESE CARS WERE DESTROYED.



87.00
THIS SALE \$

21.488
GALLONS

4.049
PRICE PER GALLON \$

"A QUIETLY SHOCKING INDICTMENT OF OUR GAS-GUZZLING AUTO COMPANIES AND THE PETRO-POLITICIANS WHO LOVE THEM."
—MARTIN SHULZ, USA TODAY

SUNDANCE FILM FESTIVAL 2006 • TRIBECA FILM FESTIVAL 2006
WHO KILLED THE ELECTRIC CAR?

A SONY PICTURES CLASSICS RELEASE. ELECTRIC ENTERTAINMENT PRESENTS A DEAN WELTON/FUNNYMIND PRODUCTION A FILM BY CHRIS PAINE "WHO KILLED THE ELECTRIC CAR?" NARRATED BY MARTIN SHULZ. EDITED BY MICHAEL KOVALENKO CHRIS A. PETERSON. DIRECTOR OF PHOTOGRAPHY THADDEUS WADZIEH. ORIGINAL MUSIC BY MICHAEL BROOK. CONSULTING PRODUCER ALEX GIBNEY. EXECUTIVE PRODUCERS DEAN WELTON TAVIN MARIN TITUS RICHARD D. TITUS. PRODUCED BY JESSIE BEETER. WRITER AND DIRECTOR BY CHRIS PAINE. CASTING BY JILL LINDENBAUM. COSTUME DESIGNER JILL LINDENBAUM. HAIR BY JILL LINDENBAUM. MAKEUP BY JILL LINDENBAUM. PRODUCTION DESIGNER JILL LINDENBAUM. EXECUTIVE PRODUCERS DEAN WELTON TAVIN MARIN TITUS RICHARD D. TITUS. PRODUCED BY JESSIE BEETER. WRITER AND DIRECTOR BY CHRIS PAINE. CASTING BY JILL LINDENBAUM. COSTUME DESIGNER JILL LINDENBAUM. HAIR BY JILL LINDENBAUM. MAKEUP BY JILL LINDENBAUM. PRODUCTION DESIGNER JILL LINDENBAUM.

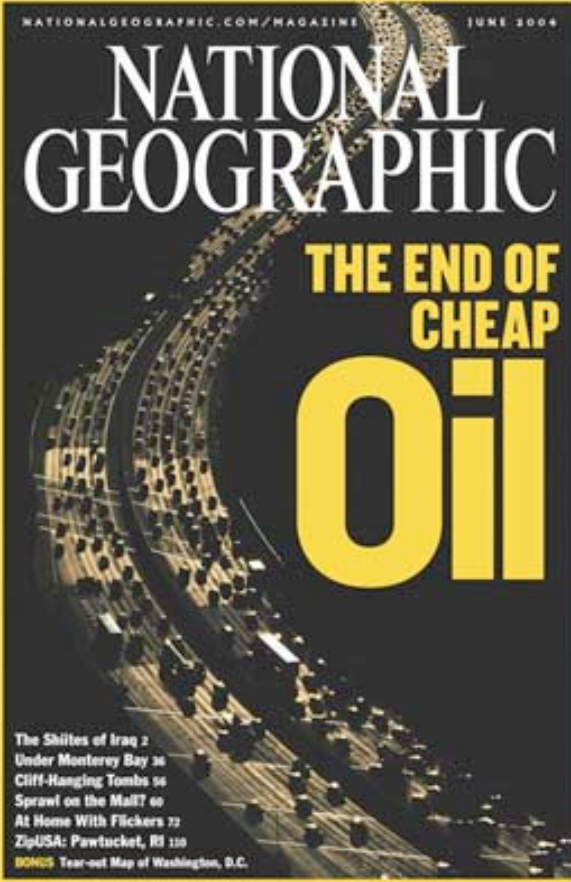
www.whokilledtheelectriccar.com www.sonyclassics.com

NATIONALGEOGRAPHIC.COM/MAGAZINE JUNE 2004

NATIONAL GEOGRAPHIC

THE END OF CHEAP

Oil



The Shites of Iraq 2
Under Monterey Bay 36
Cliff-Hanging Tombs 56
Sprawl on the Mall 60
At Home With Flickers 72
ZipUSA: Pawtucket, RI 110

BONUS Tear-out Map of Washington, D.C.

Timing



Timing

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National/Regional
Doubt & Uncertainty
Looking for positive reassurance

Who are our drivers?





Drivers

Techies

Early adopters

Excited to see a silicon valley car



Status from mastering the newest thing first

Configurability, details & data to chew on.

Real (non-condescending) info on how the car works.



Drivers

Sports Car Enthusiasts



Driving as sport,
not just transportation. Individualistic, risk-taking.
Up on car stats.

Drawn by performance. Status from having a cool car.

*Performance stats for bragging rights - and honing skills.
Crave feel for the road more than amenities.*



Drivers

Green “Cultural Creatives”



Cause driven, focused on environmental impact. Out to prove green values, fashion and profitability are not mutually exclusive. Idealize life “off the grid”.

High efficiency, low emissions - w/o loss of sex appeal.
Green moral superiority

Simplicity, lack of clutter. Confirmation they are “doing good” in the world.



Neo-Con Oil Isolationists

Pragmatic, nationalistic. View dangers of oil dependence chiefly in economic and political terms.

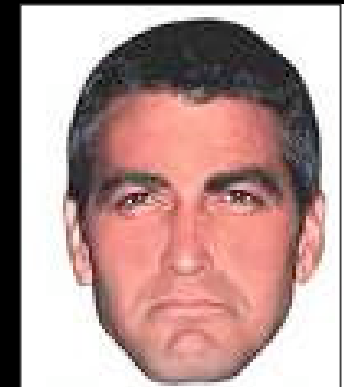


Drawn by desire to achieve “Energy Independence” (and support an American car company) for national security.

Seek confirmation of US independence from foreign oil.

Drivers

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In common: Affluent, Educated, Independent, Mostly Male

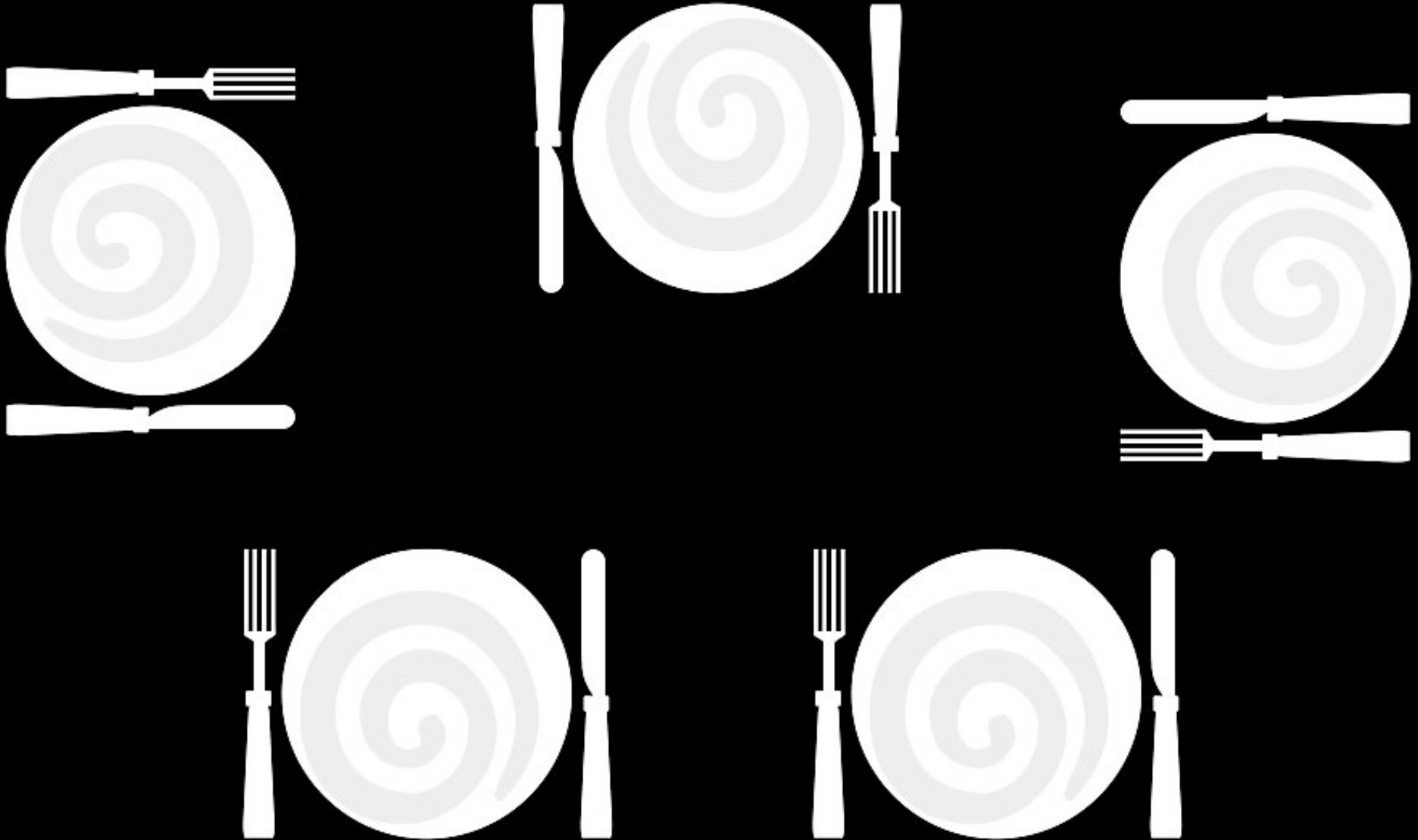
UI Challenge

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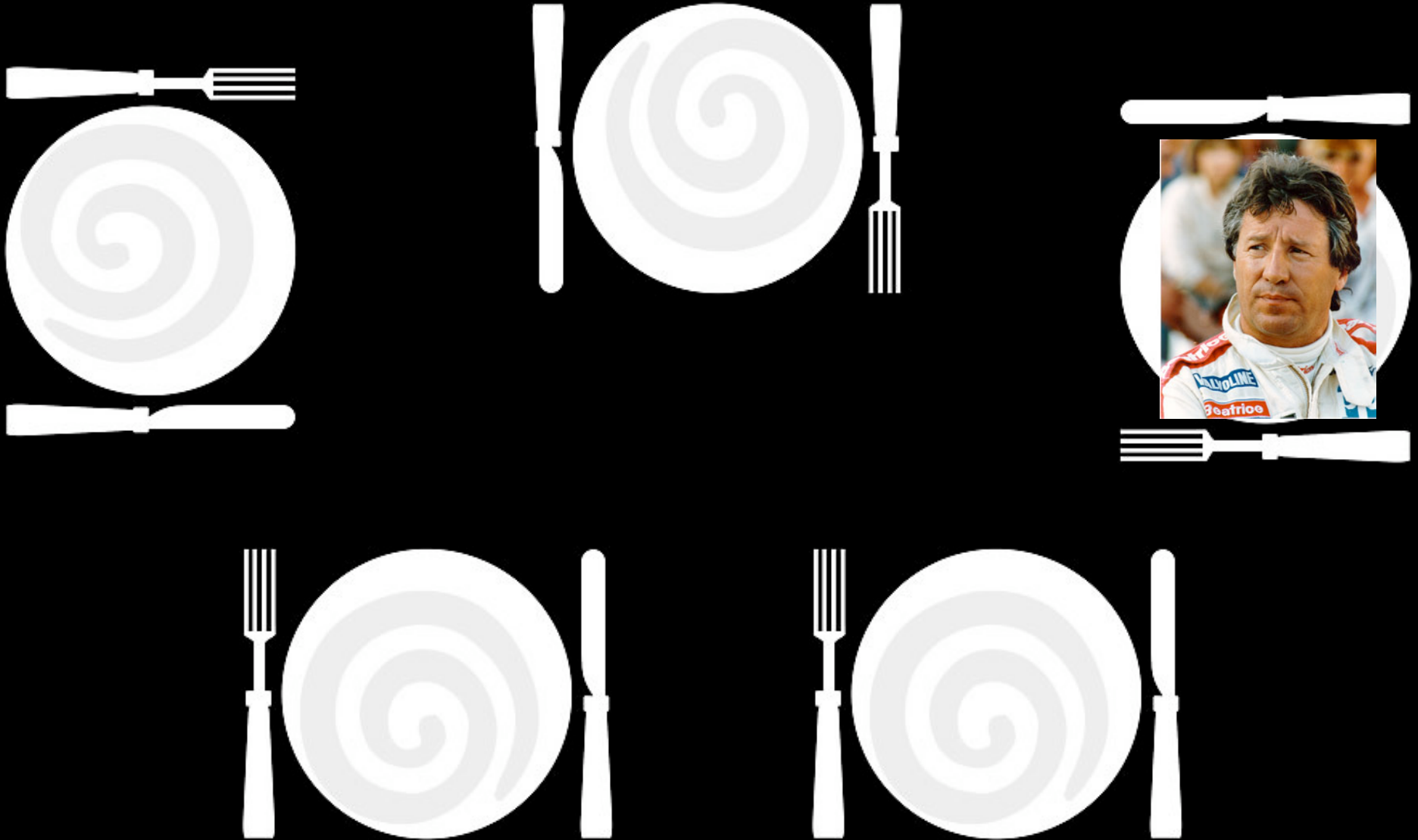
How to serve?

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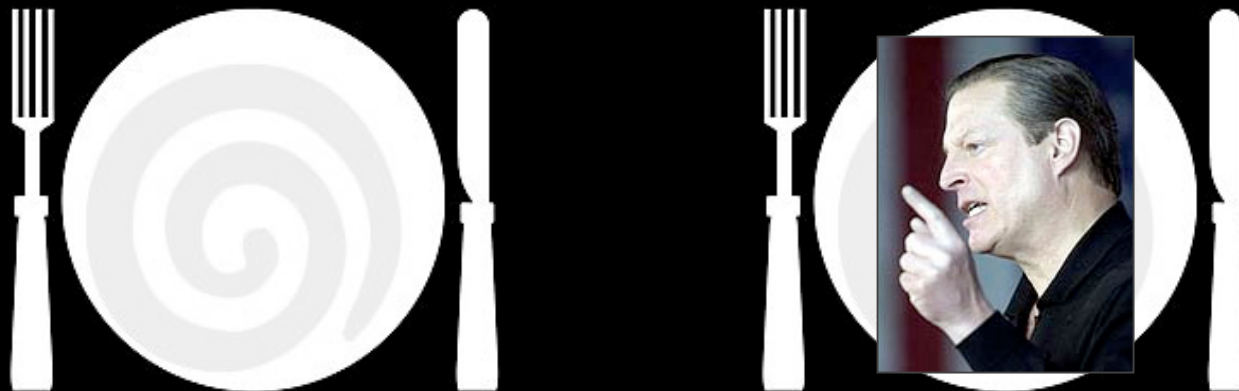
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Common Ground?



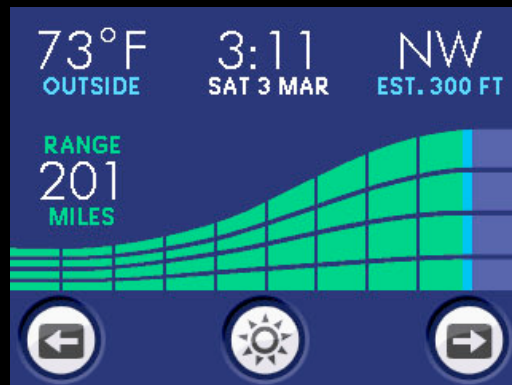
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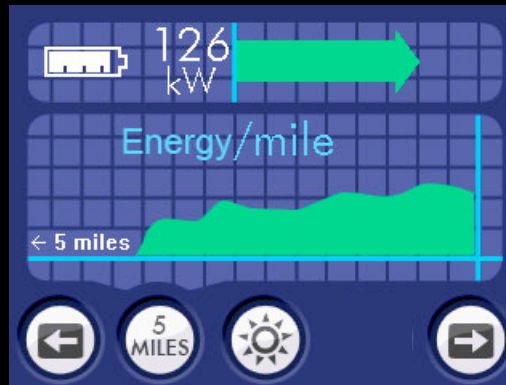


UI Challenge

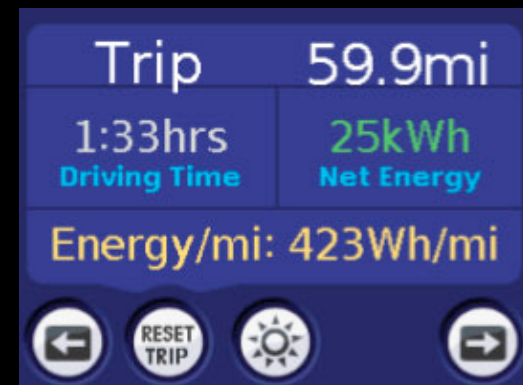
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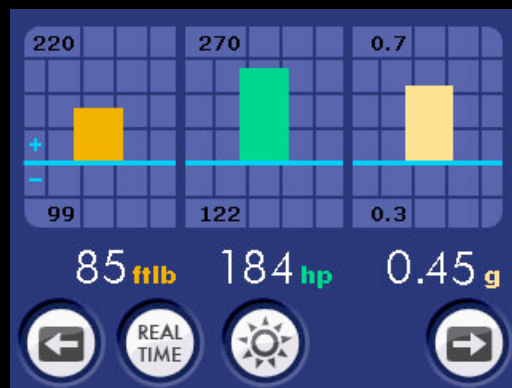
Standard



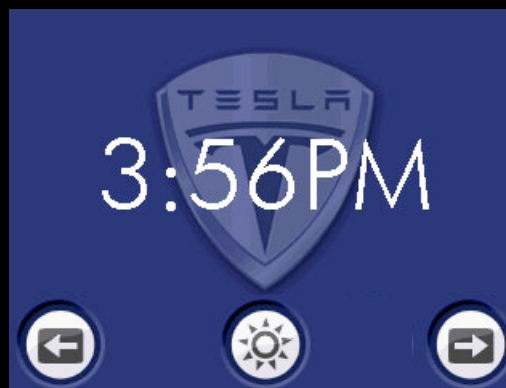
Energy



Trip



Performance



Clock



Vitals

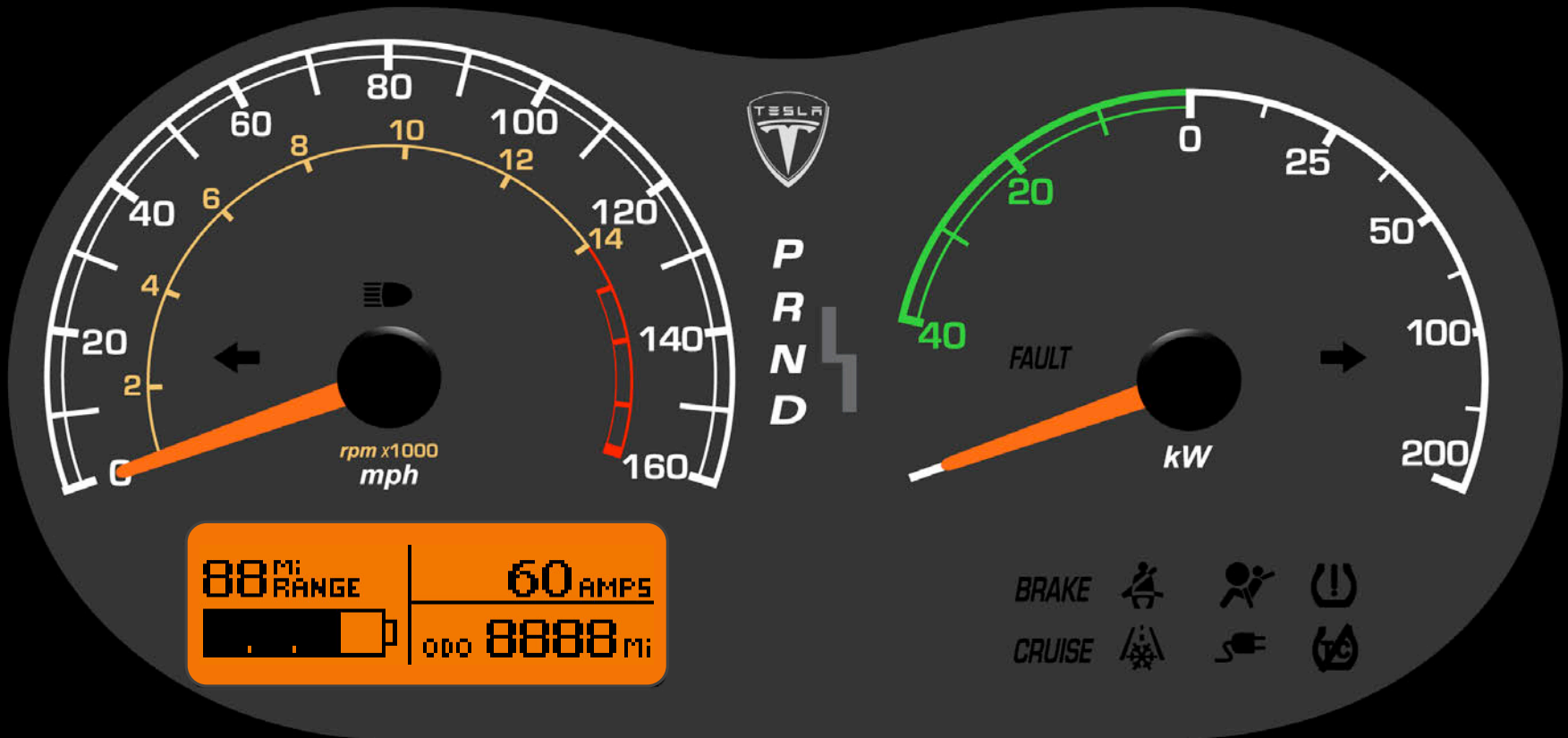
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EV Differences In Use

EV Differences

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Acceleration at any speed

EV Differences

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- Charging not instant
- You never have to go to a gas station, and probably start each day with a full tank.
(mobile phone)

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- Range highly dependant on grade
- Drive downhill, gain energy
- If battery is full, regenerative brake-assist may not be available.

EV Differences

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Sounds different.

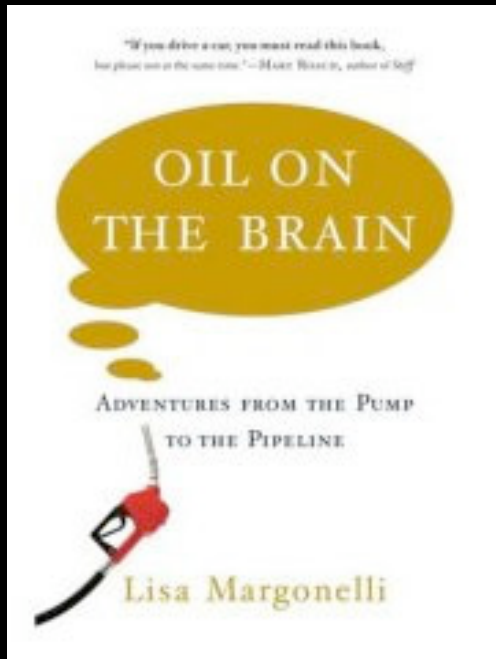
Quiet like a panther at low speeds, winds up like a jet engine.



Recommended Resources

Good Books

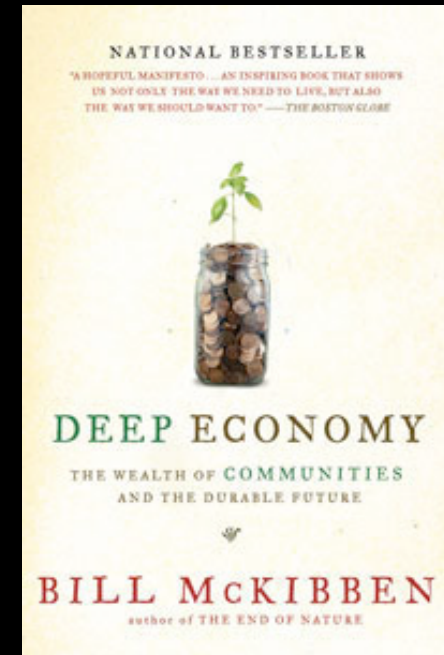
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Oil on the Brain
Lisa Margonelli



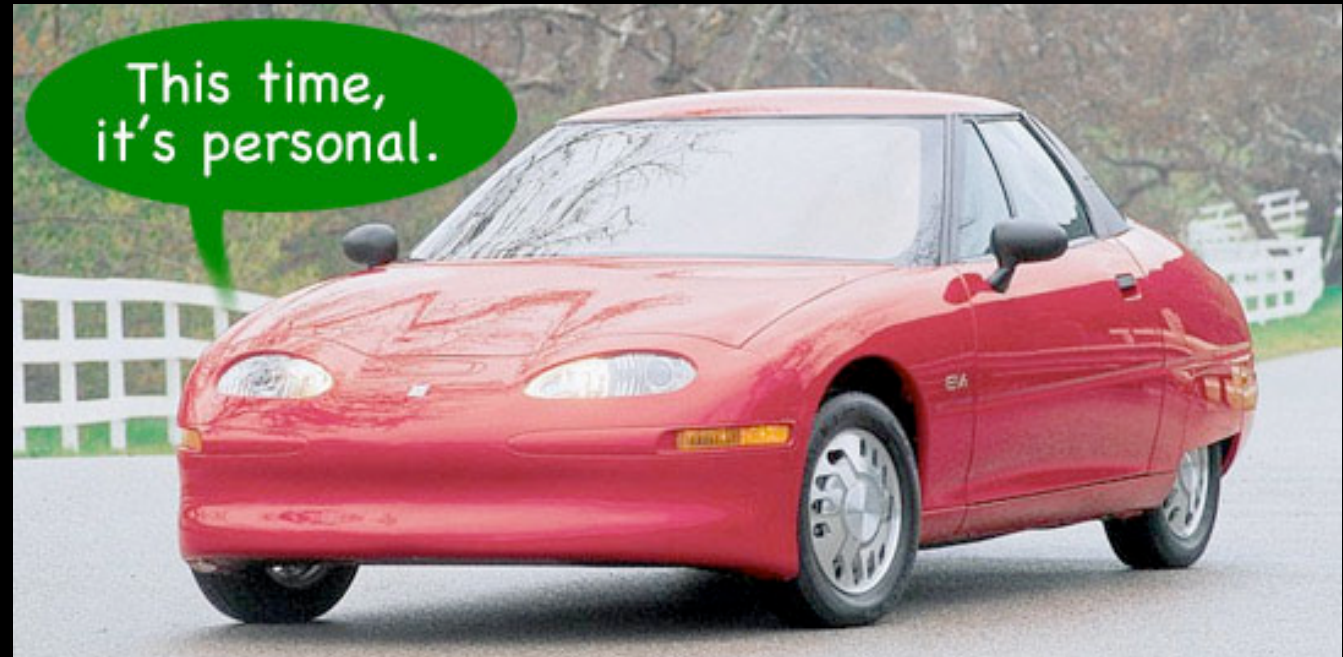
Cradle to Cradle
William McDonough
& Michael Braungart



Deep Economy
Bill McKibben

Films...

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Who Killed the
Electric Car?
Chris Paine, 2006

Revenge of the
Electric Car
Chris Paine, 2009 (?)

Parting Thought

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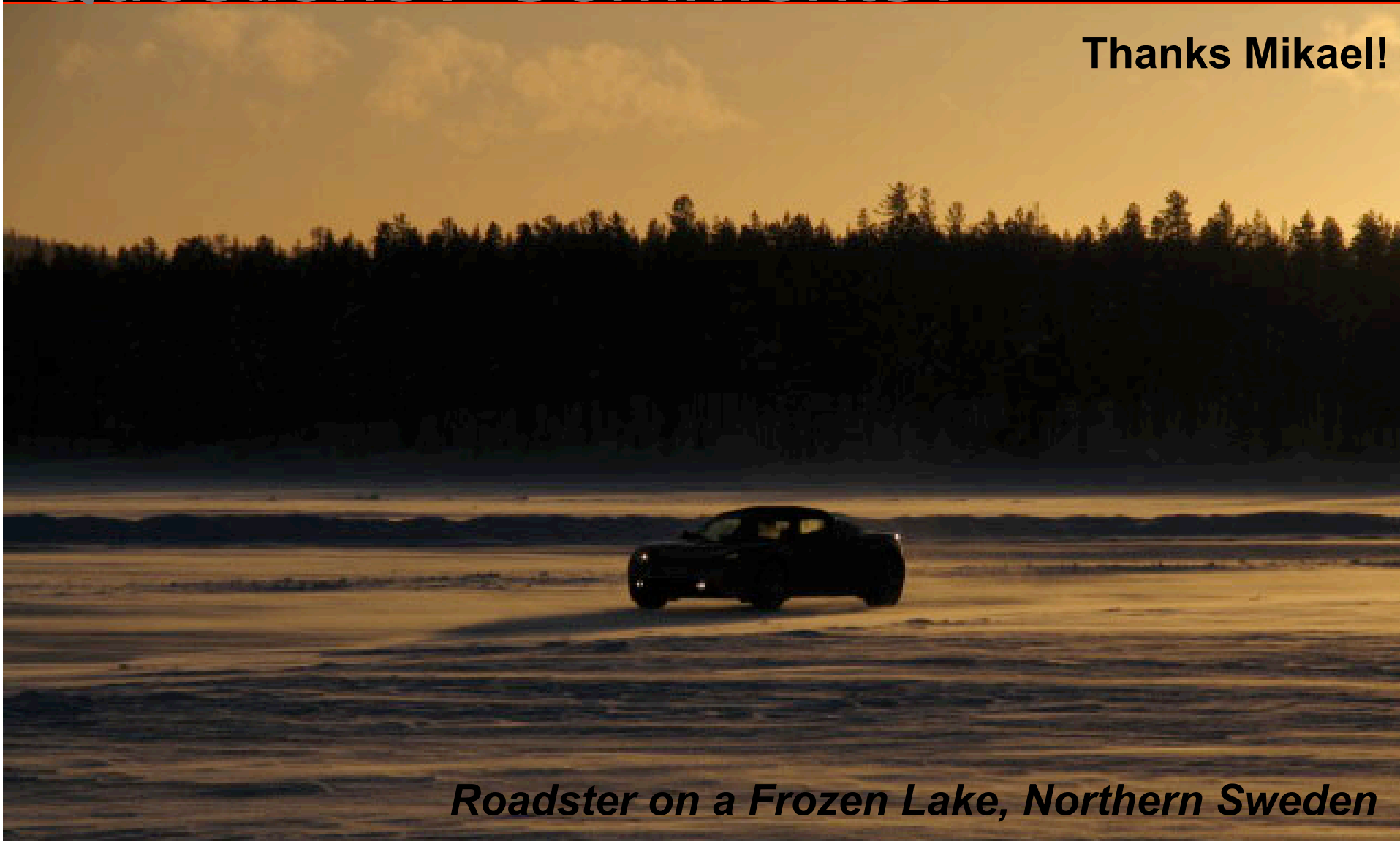
“The Stone Age came to an end not for lack of stones and the oil age will end, but not for lack of oil.”

Sheikh Yamani,
former OPEC Oil Minister

Questions? Comments?



Thanks Mikael!



Roadster on a Frozen Lake, Northern Sweden