

A SHOCKING TRANSFORMATION

DOES ELECTRIC GRID 2.0 MEAN ENERGY DEMOCRACY?

John Farrell
March 9, 2016

Presentation at NESEA 2016



IISR's
**ENERGY
DEMOCRACY
INITIATIVE**

A QUESTION



 **Bell Atlantic**

iPhone

Designed by Apple in California. Assembled in China. Model A1122
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A SIMILAR
MONOPOLY
PROBLEM

STEADY FOR DECADES

"GOLDEN AGE"

c1900

1970

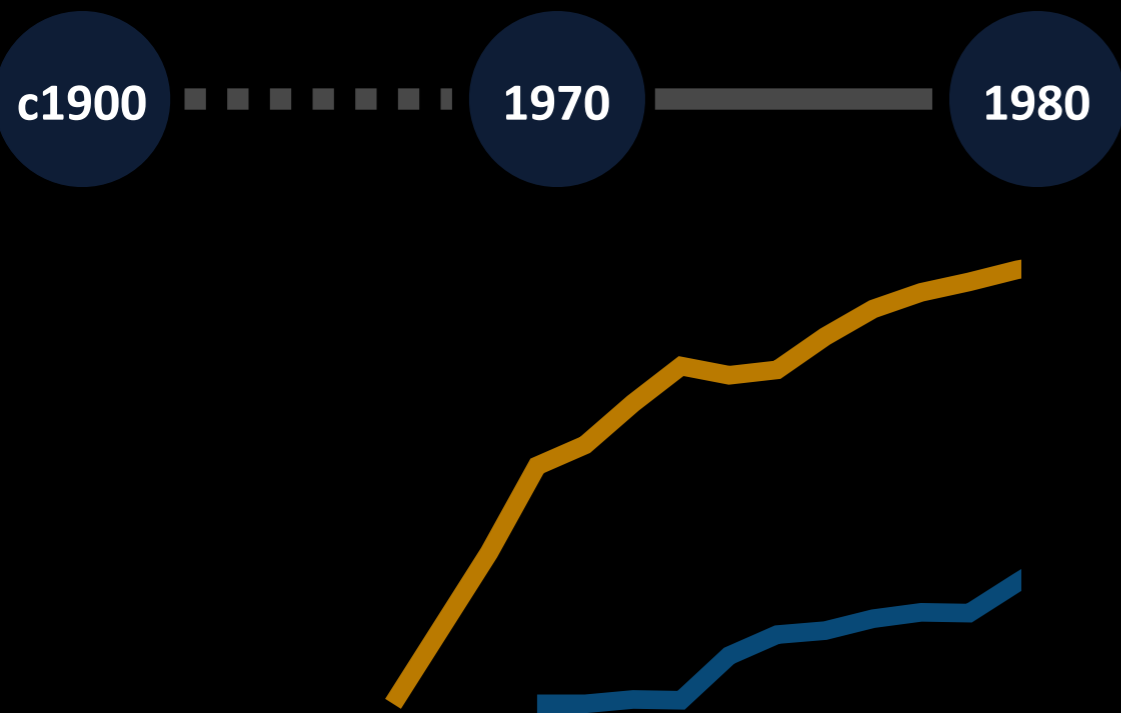


ISR's
ENERGY DEMOCRACY
INITIATIVE

SHOCK #1

"GOLDEN AGE"

COST & COMPETITION



- Per capita electricity use
- Average annual retail electricity prices

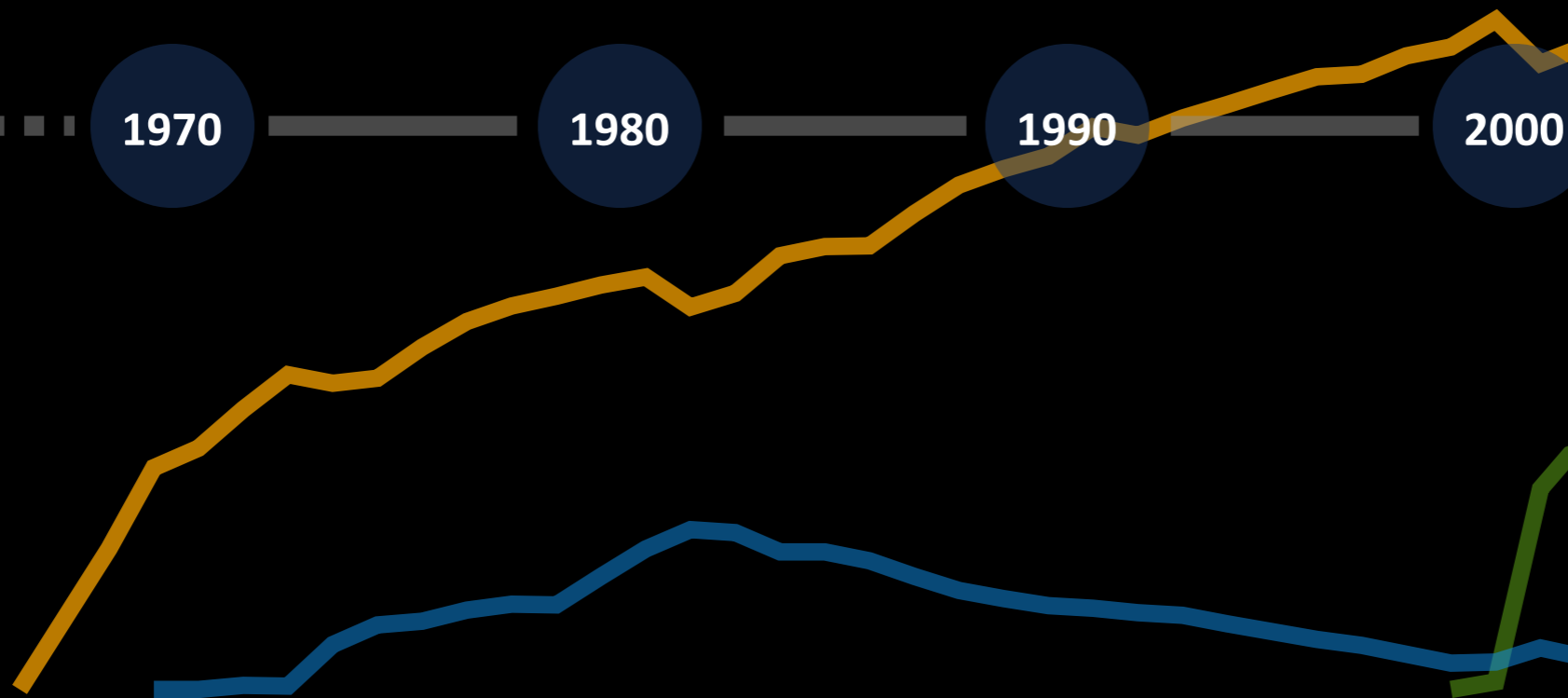
SHOCK #2




"GOLDEN AGE"

COST & COMPETITION

STABILITY

DEREGULATION & RENEWABLES



-  *Per capita electricity use*
-  *Average annual retail electricity prices*
-  *Wind and solar power capacity*

Sources: World Bank, EIA, US Census, SEIA, LBNL

A TRANSFORMATIVE TIME

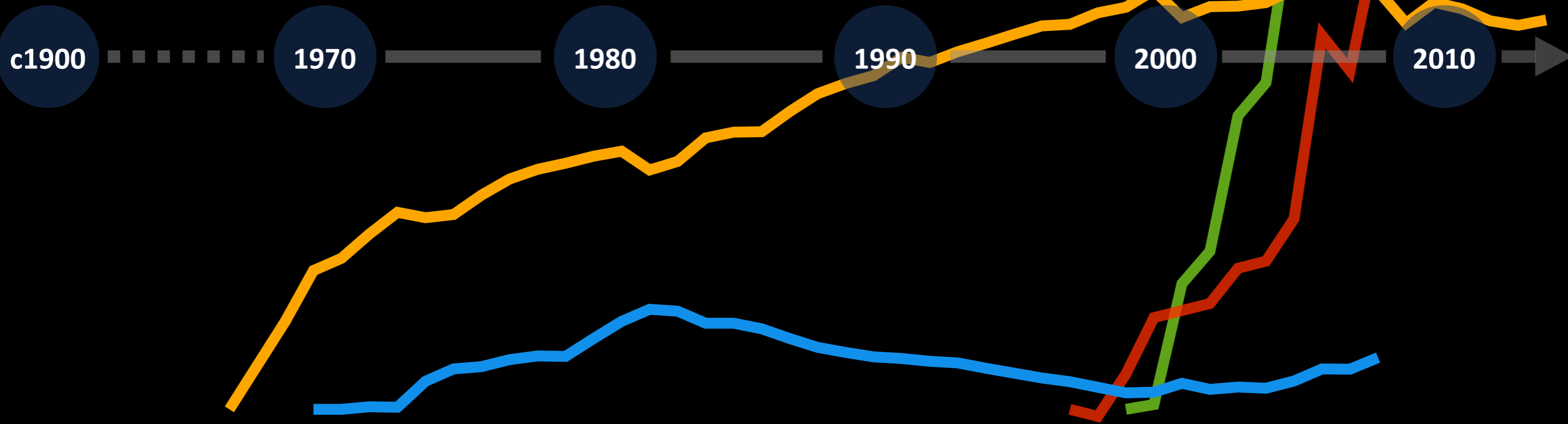
"GOLDEN AGE"

COST &
COMPETITION

STABILITY

DEREGULATION &
RENEWABLES

TRANSFORMATION



Sources: World Bank, EIA, US Census, SEIA, LBNL

- Per capita electricity use
- Average annual retail electricity prices
- Interstate transmission spending
- Wind and solar power capacity



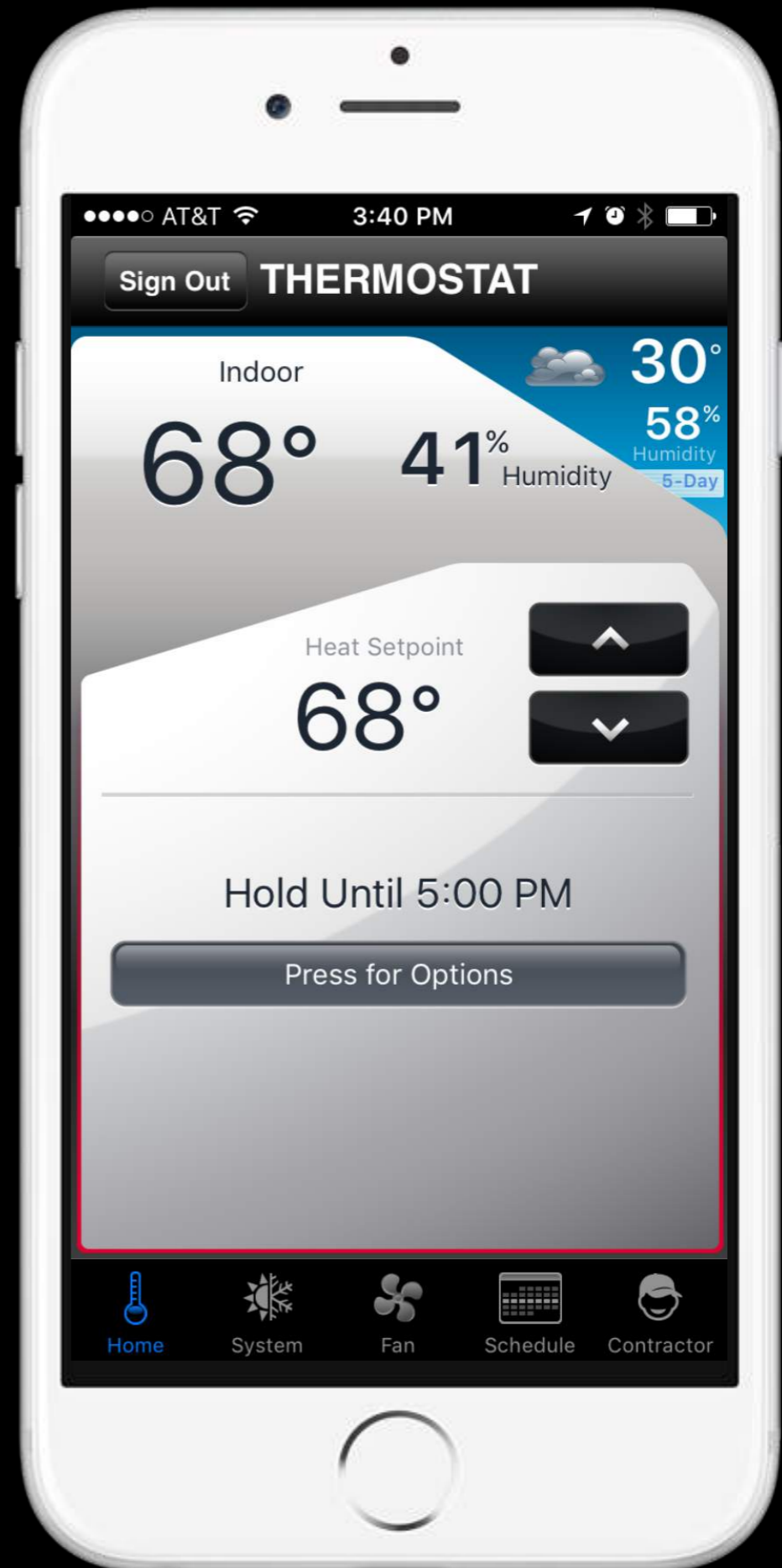
NO PIECE
OF CAKE



1 INSTALL EVERY
60 SECONDS

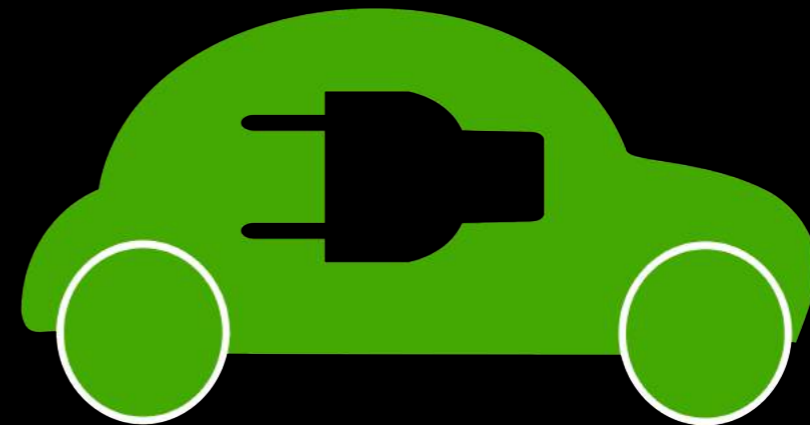
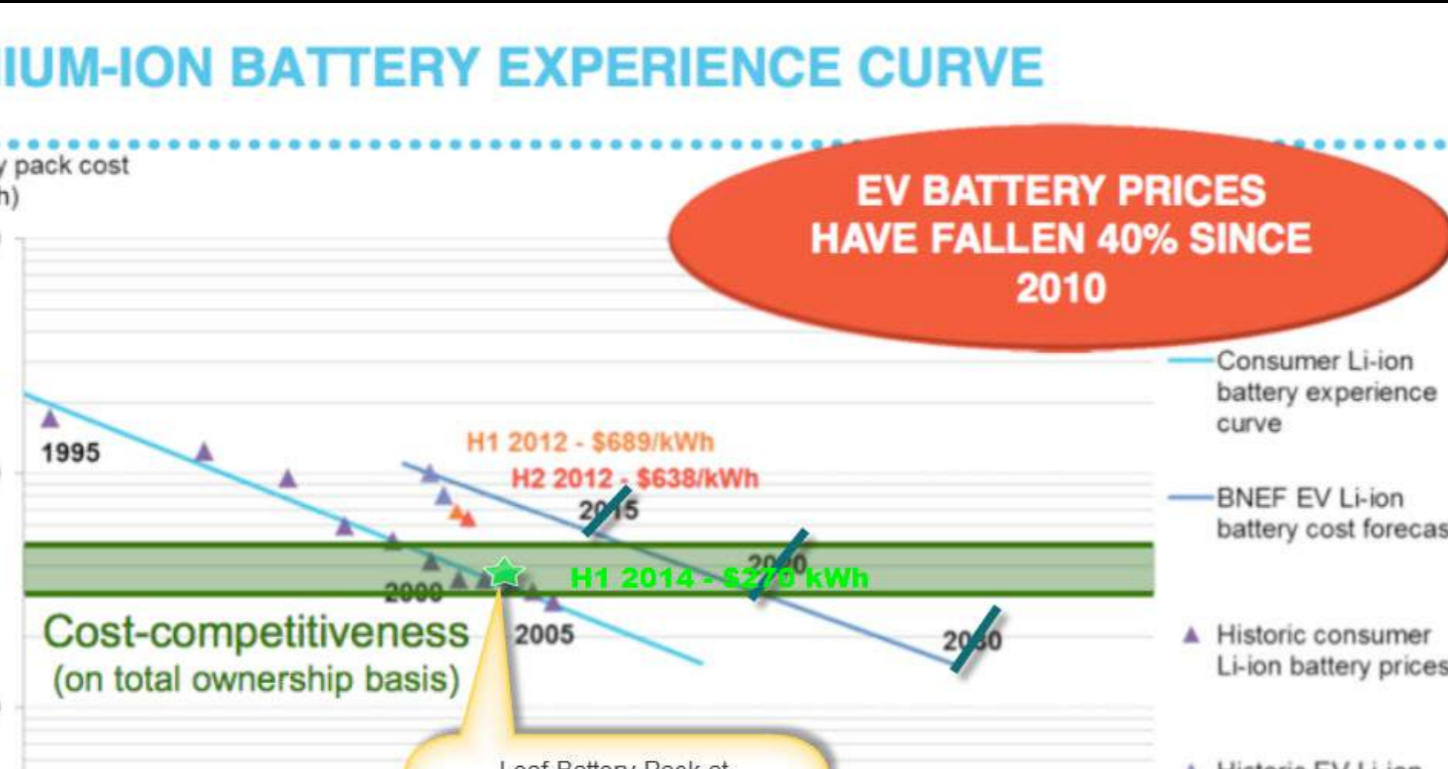
SANTA CRUZ, CA
USA

UNPRECEDENTED POWER





BATTERIES
EVERYWHERE



DISTRIBUTION GRID INVESTMENT LAGGING

*“America will see an **investment gap** in distribution infrastructure **of \$57 billion** by 2020”*

American Society of Civil Engineers



MIND THE GAP



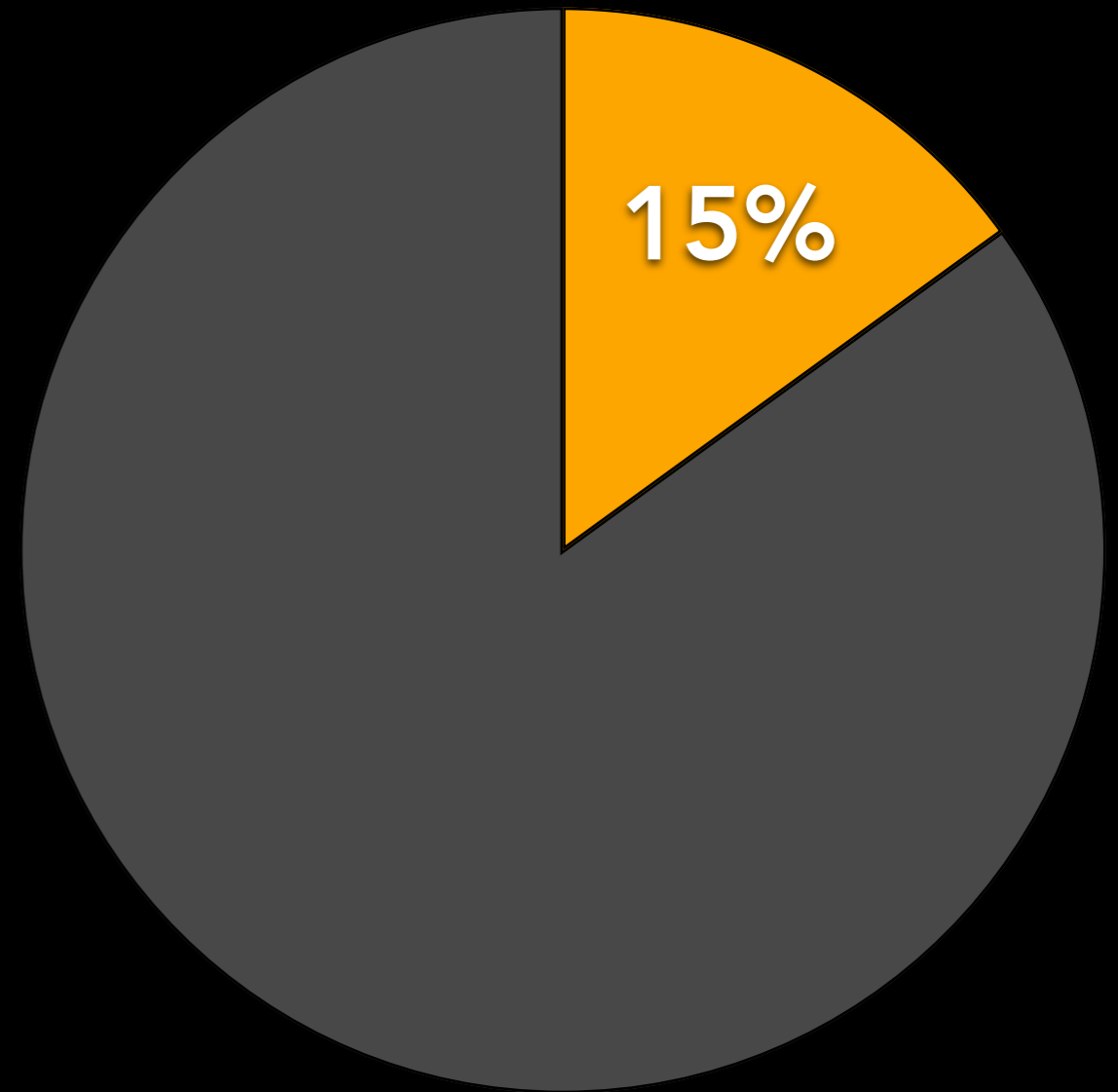
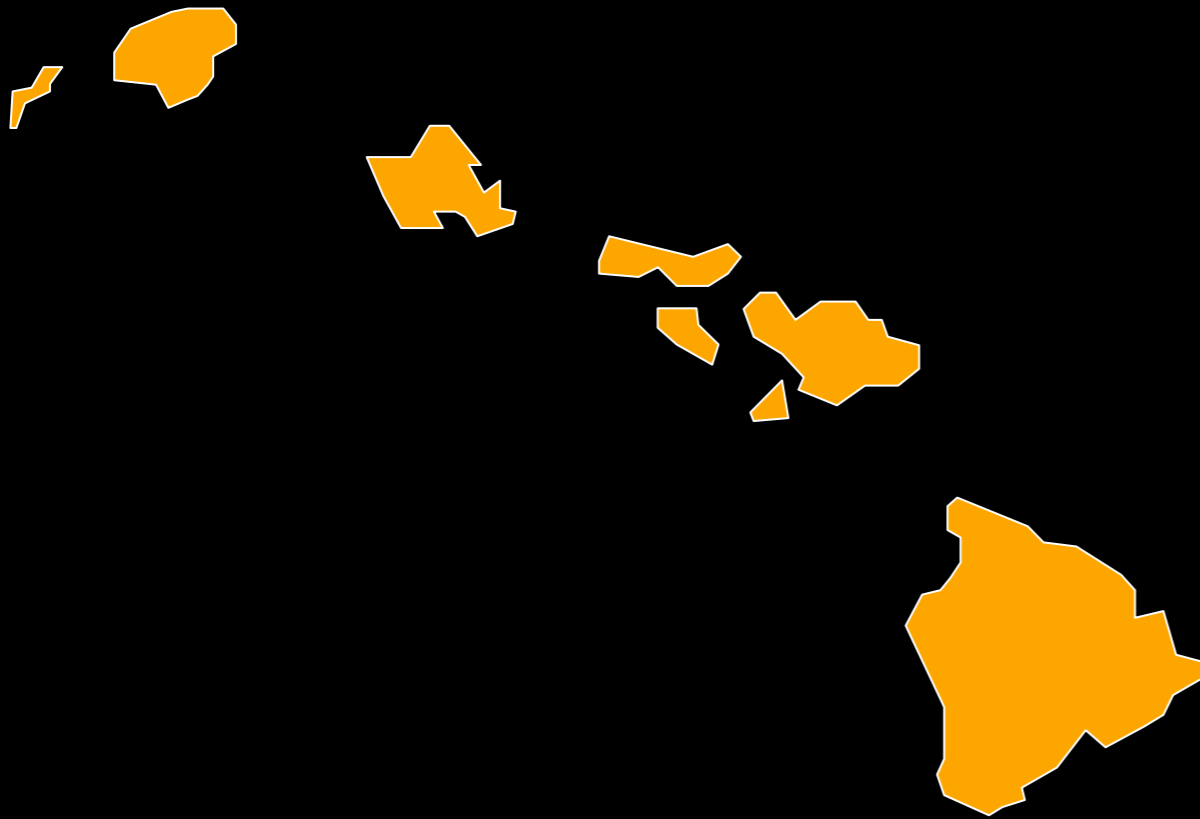
A WHOLE
NEW WORLD



Minster

POPULATION 2,806

PERCENT OF
HOUSEHOLDS WITH
SOLAR



SOLAR ALONE

SOLAR+EV+BATTERY
+SMART CONTROLS



53% used on-site

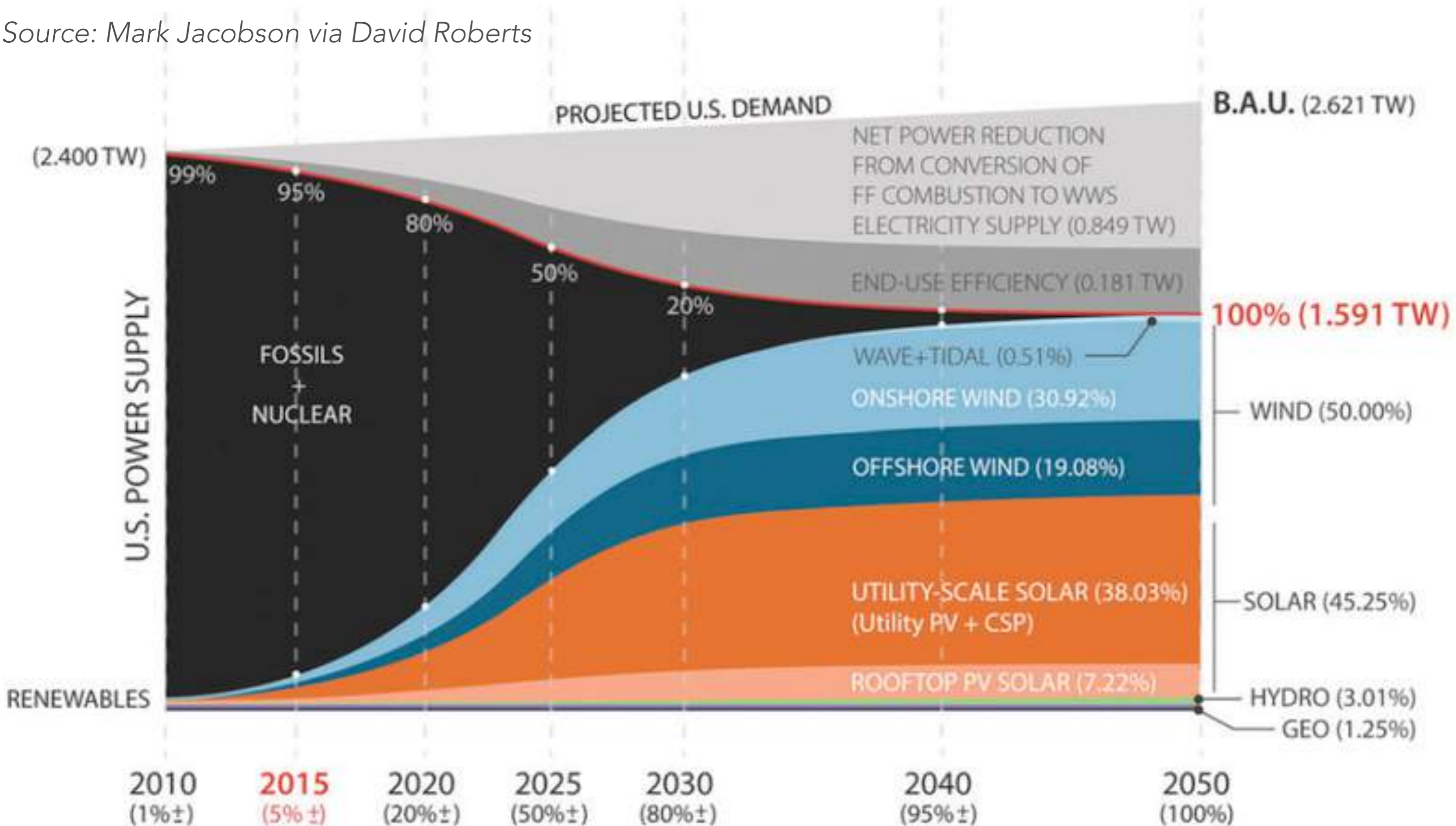
89% used on-site

HOW
DIFFERENT?



100% RENEWABLE ENERGY

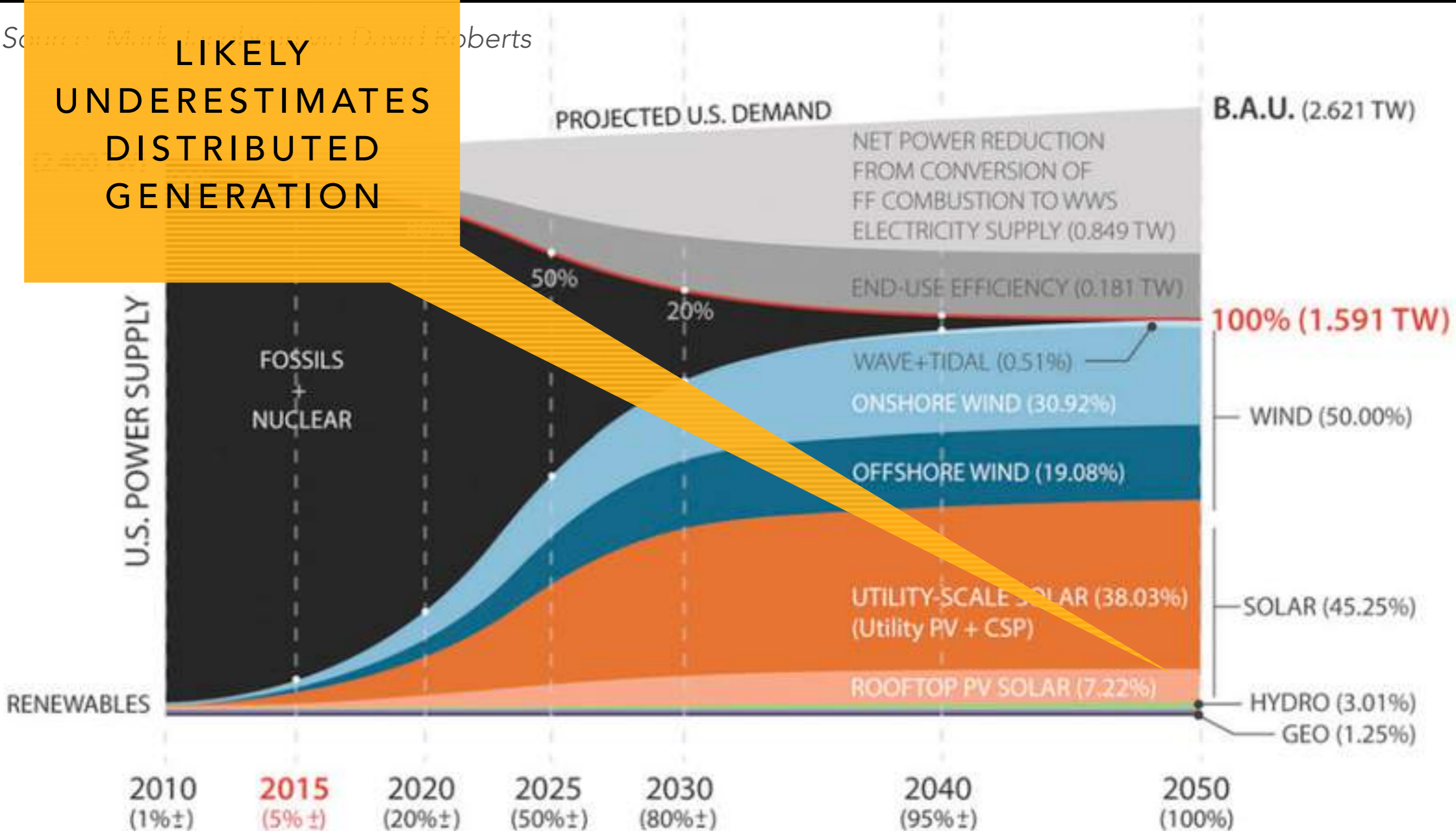
Source: Mark Jacobson via David Roberts



100% RENEWABLE ENERGY*

LIKELY
UNDERESTIMATES
DISTRIBUTED
GENERATION

Source: Mark Jacobson and David Roberts





Credit: mark notari via Flickr

*WITH A FEW CHANGES IN DIRECTION

1. ELECTRIFY EVERYTHING



Credit: Ken Bosma via Flickr

2. REDUCE USE

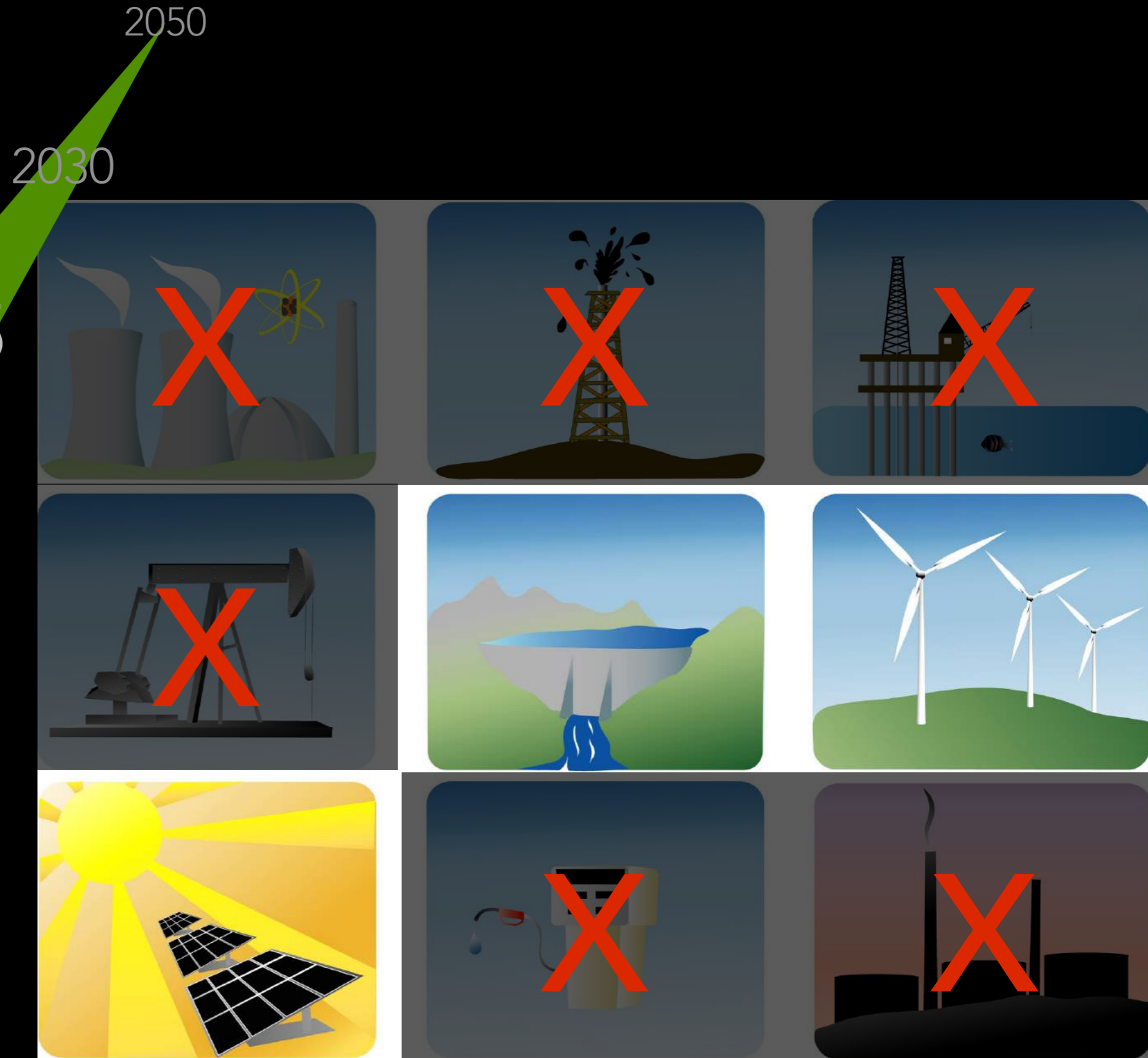
39.3%

Compared to business-as-usual

3. WIND-WATER-SOLAR ONLY

for new
power
plants
after 2020

016



ELECTRIFICATION TIMELINE TO REACH 100% RENEWABLE BY 2050

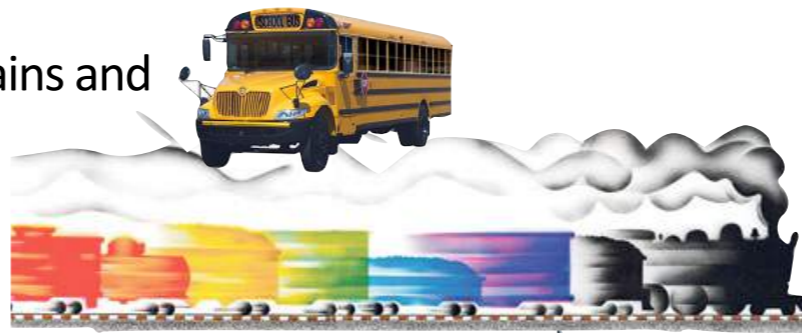
Heating, drying, and cooking in the residential and commercial sectors



2015

2020

All new trains and buses



2025

All new heavy duty trucks

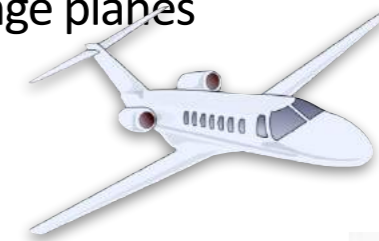


2030

All new light-duty vehicles



All new small, short-range planes



2035

All new long-haul aircraft



2040

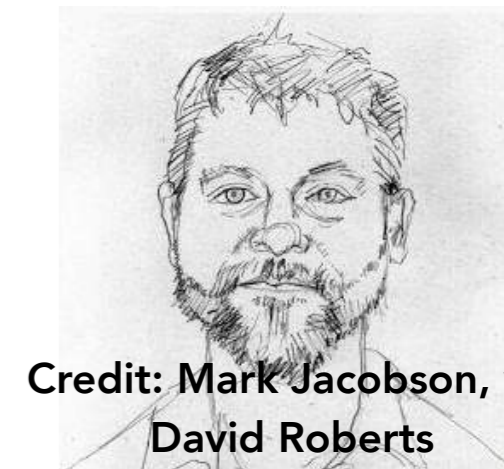
All new ships and ports



All new small marine vessels



IN JUST 25 YEARS...



A hand is shown holding a hammer, poised to strike a large, dark, spherical metal weight. The weight is suspended from a chain and is positioned on the left pan of a mechanical scale. The background is a blurred industrial setting with various mechanical parts and a sign that partially reads "LECTRIC COMPANY". The scene is overlaid with a semi-transparent, stylized graphic of a hand holding a hammer, suggesting a metaphorical or literal act of force or impact.

ADAPT OR DIE?





NEW RULES

- Enable alternatives

5 Reasons Why Microgrids Face Macro-Problems

1. A microgrid is undefined in most state laws



2. Questions as to who legally sells/distributes energy

3. Utilities denying interconnection requests



4. Lack of a plug-and-play control solution

5. Who pays for it?
Who benefits?



NEW RULES

- Set up markets



NEW RULES

- Allow power sharing





John Farrell | 0 Comments | Dec 15, 2014

A \$48 Billion Opportunity for U.S. Electric Customers

Electricity customers in the U.S. got good news last week. A new report from Accenture highlighted a potential revenue loss for U.S. utilities of \$48 billion per year by 2025 due to distributed solar and energy efficiency. But where does that money go? If we pursue a democratic energy system as outlined in ILSR's new...

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OUR FULL
REPORT



Beyond Utility 2.0 to Energy Democracy

Why a technological transformation in the electricity business should unlock an economic transformation that grants power to the people.

John Farrell
December 2014



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