100% Renewable Energy: From Pipedream to Mainstream

Building Carbon Zero 2015

Presentation by Diane Moss

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Go 100% Renewable Map

Who’s going 100% renewable in at least one sector?

8 Countries, 55 Cities, 61 Regions, 9 Utilities, 2+ NonProfit / Educational / Public Institutions, representing more than 54.9 million people in the next few decades, and counting… See Go100Percent.org for details.
100% Goal: From Pipedream to Mainstream
Renisla 2014 El Hierro Declaration:
Call To Action for 100% Renewable Energy
Emerging in Global Leadership Talks

June 2015 G7 Leaders’ Declaration:
Decarbonize Economies by 2100

Image: Michael Kappeler/picture-alliance/dpa/AP Images/Associated Press
Encyclical: Replace Fossil + Nuclear Fuel with RE
**Cities, Counties, States in US**

**Examples Committed to 100% Renewable Power Procurement**
- Lancaster, CA by 2020
- Marin County, CA by 2020
- Palo Alto, CA by 2017 (internally exploring other sectors)
- San Francisco, CA by 2020
- San Jose, CA by 2022
- San Diego, CA by 2030
- Aspen, CO by 2015
- Georgetown, TX by 2017
- East Hampton, NY by 2020 (other sectors by 2030)
- Hawaii - 100% RPS by 2045

**Examples that have already achieved it**
- Greensburg, KS (plus committed in other sectors)
- Burlington, VT

**Examples likely to adopt commitments soon**
- Several LA Region coastal cities
Debate 1.0: If it’s possible to go 100% renewable

“Petroleum-based fuels...as well as hydrocarbons such as coal and natural gas, will remain the dominant sources of energy...for decades because there are no viable alternatives.” -- Exxon Mobil CEO Rex Tillerson, 2009
100% RE: Not a question of “if”

Global Conventional Energy Proven Supplies

uranium
80 years left (WNA 2012)

coal
112 years left (BP 2011)

petroleum
52.9 years left (BP 2012)

natural gas
55.7 years left (BP 2012)
If you don’t change direction, you may end up where you are headed.
- Lao Tzu
Price history of silicon PV cells in US$ per watt

Source: Bloomberg New Energy Finance & pv.energytrend.com
100% RE: Discourse Beginning to Shift

Debate 2.0: When, How, and Who Will Lead and Profit

Photo credit: Agrokraft
100% RE: from Debate 1.0 to 2.0

Debate 2.0: When, How, and Who Will Lead and Profit
100% RE: from Debate 1.0 to 2.0

Debate 2.0: When, How, and Who Will Lead and Profit

Source: Statnett
100% RE: from Debate 1.0 to 2.0

Debate 2.0: When, How, and Who Will Lead and Profit

Big Savings from Vehicle-Grid Integration (VGI)

The U.S. electrical grid lacks energy storage. Battery-powered cars could fill this gap, storing and returning energy as needed.

EV owners are paid by utilities for allowing vehicle batteries to store energy, thus stabilizing the grid. $300-$5000/vehicle/year saved by consumers and up to $4 billion in annual benefits for renewable energy.

EV owners can schedule charging when green renewable energy is most plentiful.

EV battery storage can buffer peak demand on grid, preventing damage and wear of transformers and wires. $300 million to $1.6 billion in annual grid system value.

Roof-top solar can power cars, instead of going back to the grid. EV owners can use this “free” solar fuel. Up to $1000/vehicle/year saved by consumers.

Grid operators can use EV batteries to smooth peaks and valleys on demand, avoiding use of peaker plants. $150 million per year in avoided investment cost for kWh from solar and up to $3 billion in emissions savings nationwide.
More storage possible in 100% power by 2050 scenario with Power to Gas than other options (German Federal Environment Agency / Fraunhofer IWES)
"Sure, it's a great invention, but does it comply with all government guidelines?"
1. It’s almost inevitable. And it will either happen with you or to you.
Why focus on 100%?

2. It focuses decision makers & planners.

Mr. President, are you sure 10 or 20% of the way to the moon isn’t a safer bet?

No, James, we’re going 100%!
Why focus on 100%

3. It’s exciting!
Go 100% Renewable Energy

Join the community of millions around the world who are showing 100% renewable energy...

...is not a fantasy for someday, but a reality today.