



Changing Energy:

Thoughts on Energy & DOE under the New Administration

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Personal Intro: David Danielson



- Precourt Energy Scholar, Stanford University
- Former **Assistant Secretary** of Energy Efficiency & Renewable Energy (EERE), DOE
- Co-Founder/Employee #1, **ARPA-E**, DOE
- Advisory Board, **GE** Ecomagination
- Former Clean Energy **VC**
- PhD, MIT

Driving Factors for Energy Under Trump Administration?

- Energy Security, Low Cost Energy, Manufacturing Competitiveness In; Climate/Environment Out
- Pendulum swings toward big existing energy sources/big politically powerful players
 - Fossil Energy, Nuclear Energy, Automakers Incremental Tech, Utilities
- Pendulum swings away from Renewable Power, EV's, Biofuels, Fuels Cells/H2, Building Efficiency
- Reduced Regulation
- General push toward more science/early applied R&D support; very little support for deployment programs; mixed politically motivated support for scale-up programs
- Manufacturing competitiveness increasingly important angle for companies to leverage
- Infrastructure Focus (Fate of Loan Guarantee Program??)

Predictions for Energy Under Trump Administration

- U.S. Federal Government abdicates global climate leadership position to China
 - U.S. doesn't support global climate agreement
 - China uses as opportunity to pivot into global leader nation on “moral authority”
 - **CHINA RELEVANCE IN ENERGY INCREASES**
 - **IMPORTANCE OF CHINA STRATEGY INCREASES FOR ENERGY COMPANIES/INVESTORS**
- Clean Power Plan gets stalled/derailed
 - Relatively low importance for clean power deployment?
 - Renewable Power Tax Credits passed by Congress, phase down already
 - State/City Leadership
 - **WE WERE LIKELY TO HIT CPP TARGETS ANYWAY**

Predictions for Energy Under Trump Administration

- Appliance Energy Efficiency Standards
 - Congressional Review Act allows undoing of regs enacted back to May 2016
 - Easy to slow, stall
 - Very hard to undo what was done before May 2016 (which is a lot)
- CAFÉ?
 - Automakers would love to undo this...
 - EPA trying to accelerate mid-program review...
- Renewable Fuel Standard...
 - Remains dysfunctional or gets fixed?

DOE \$ Basics

- **EERE: ~\$2B/year**
 - Transportation, Renewable Power, Building Efficiency, Advanced Manufacturing
- **Fossil: ~\$1B/year**
- **Nuclear: ~\$1B/year**
- **ARPA-E: ~\$300M/year**

Predictions for DOE Under Trump Administration

- Stable/increased funding for Nuclear/Fossil Energy
 - Including support for scale-up...
- Stable funding for ARPA-E (bipartisan support)
- Significantly decreased funding for EERE (~30%)
 - Transportation, Advanced Manufacturing stable or grow (Vehicles, Biofuels, Fuel Cells)
 - Renewable Power, Energy Efficiency hit hardest
 - Deepest reductions in scale-up funding,
- Significant decreases in DOE/EERE staff numbers
 - High turnovers of more senior leaders (DAS, Directors)
 - High attrition of more recent high talent hires
 - Long-term committed federal staff become increasingly important decision makers

How to Successfully Engage with DOE/ARPA-E

- Concerted effort should get you an average **~\$1M/year** non-dilutive funding over 5-10 years.
- Strategy:
 - Build a long-term relationships
 - Visit DOE every 6 months
 - Do meetings all the way up and down the chain
 - Attend relevant workshops
 - Two way street – give value, get value
- Outcomes:
 - Trusted players have higher probability of funding
 - Long-Term: Guide program design/focus

...A Back Door to the Competitive Process...

- DOE staff can easily and flexibly direct funds to the National Laboratories for joint projects with companies
- Build strong relationships with DOE staff AND key relevant National Lab staff
- Work with Lab/DOE HQ staff to develop a scope of work
- Take the standard contract terms to avoid excessively long time to contract

Recent/Continuing EERE Program Trends:

- Smart Mobility Initiative
- Engine/Fuels Co-Optimization Initiative
- Biomass to High Value Products
- Energy Materials Network (i.e. Materials Genome)
- Geothermal: Field Observatory for Research in Geothermal Energy (FORGE)
- Advanced Manufacturing!!!
 - NNMI's, National Lab Manufacturing Demo Facilities (MDF)
 - MDFs: 3D Printing, HPC4MFG, Synthetic Biology Foundry

EERE Programs Most Worth Engaging With...

- National Network of Manufacturing Innovation
- Manufacturing Demonstration Facility (3d printing at Oak Ridge Lab)
- Energy Materials Network (National Labs)
- HPC4MFG Program (Livermore Lab)
- Lab Incubators: Cyclotron Road (LBNL), Chain Reaction (ANL), Innovation Crossroads (ORNL)
- Lab Small Business Vouchers Program (sbv.org)

ARPA-E... Innovation Summit: Feb 27 – Mar 1, 2017

- Good budget prognosis/bi-partisan support
- Does ARPA-E retain its autonomy? Critical question for survival of impactful model
- For companies, direct engagement to guide program design provides high opportunity. Directors have a LOT of discretion...
- Likely pivot to more fossil energy related topics, constrained in recent years (NG vehicles, Modular GTL, etc)
- Current Topics of Interest:
 - Telepresence, Fuel Cell/Heat Engine CHP, Waste Heat Recovery, Rewiring Anaerobic Digestion, Grid Control/Optimization, Wide Bandgap Power Electronics, Macroalgae for Biofuels, Nuclear Power...

Happy to Engage Further...

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