

# WORDS

Sam Rashkin

Chief Architect, U.S. DOE Building Technologies Office

Power Words:

It's really difficult to sell...

Patagonian **Toothfish**

Power Words:

It's much easier to sell an...

Chilean Sea Bass

Power Words:

It's difficult to rally public opinion against an...

Estate Tax

Power Words:

It's much easier to rally public opinion against a...

Death Tax

Power Words:

It's really difficult to sell an...

Energy **Audit**

Power Words:

It's much easier to sell an...

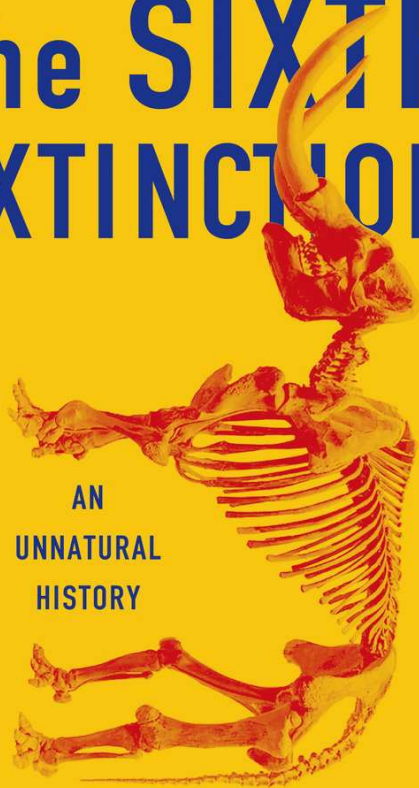
Energy **Check-up**

# Building America Building Science Translator

February 2015



# The **SIXTH** EXTINCTION



AN  
UNNATURAL  
HISTORY

**ELIZABETH KOLBERT**

Author of *FIELD NOTES  
FROM A CATASTROPHE*

AUTHOR OF *NO LOGO* AND *THE SHOCK DOCTRINE*

# NAOMI KLEIN

THIS CHANGES EVERYTHING  
**CAPITALISM vs  
THE CLIMATE**

NAOMI  
KLEIN  
THIS  
CHANGES  
EVERY  
THING  
CAPITALISM vs  
THE CLIMATE

# THIS CHANGES EVERY THING

# Substance

An addictive drink or drug  
with harmful side-effects.

# Fossil Fuel

~~Fossil Fuel~~

Fossil Substance

~~Fossil Fuel~~

## Fossil Substance

An addictive energy resource  
with harmful side-effects associated with  
exploration, extraction, processing,  
distribution, consumption, and emissions.

# Sample Fossil Substances

- Gasoline
- Oil
- Natural Gas
- Coal

# Fossil Fuel Dependency

~~Fossil Fuel Dependency~~

Fossil Substance Abuse



# ~~Fossil Fuel Dependency~~

## Fossil Substance Abuse

The excessive use of fossil substances that leads to negative environmental, health, and economic impacts.

# Fossil Substance Impacts

- High/Volatile Energy Costs
- Reduced National Security
- Reduced Economic Development
- Air Pollution
- Water Pollution
- Environmental Damage
- Species Extinction
- Melting Polar Caps/Sea Level Rise
- Acidification of the Oceans

# Fossil Fuel Consumers

~~Fossil Fuel Consumers~~

Fossil Substance Addicts

~~Fossil Fuel Consumers~~

Fossil Substance Addicts

Compulsive users of fossil substances  
despite their harmful consequences.

# Addictive Behavior

- **Constant State of Denial**
  - Dependency
  - Steady Atrophy to Quality of Life
  - Ignored Responsibilities
  - Negative Impacts to Themselves
  - Negative Impacts to Loved Ones
- **Take Risks Can't Afford**
  - Costs
  - Health
  - Physical Harm
  - Without Treatment, Things Don't End Well

# Fossil Fuel Companies

~~Fossil Fuel Companies~~

Fossil Substance Dealers



# ~~Fossil Fuel Companies~~

## Fossil Substance Dealers

Business enterprises that substantially control fossil substance distribution and pricing, and are vested in a growing number of fossil substance addicts.

Irony

*The Atlantic*

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# Why the Saudis Are Going Solar

The fate of one of the biggest fossil-fuel producers may now depend on its investment in renewable energy.

# External Costs

~~External Costs~~

Side-Effects

# ~~External Costs~~

## Side-Effects

Secondary effects associated with an activity that can be negative or positive.

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# Fossil Fuel External Costs

~~Fossil Fuel External Costs~~

Fossil Fuel Side-Effects



# ~~Fossil Fuel External Costs~~

## Fossil Fuel Side-Effects

Secondary effects of fossil substance use that are usually negative, entailing significant economic, health, and environmental costs.

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# Fossil Substance Sample Side-Effects

- Cost of Military Protection for Strategic Interests
- Cost Military Interventions
- Cost of Lives Lost in Military Interventions
- Cost of Lifetime Health Services for Injured Veterans
- Cost of Public Health Problems Due to Polluted Air
- Cost of Pollution Clean-up from Spills/Extraction
- Cost of Repairing Environmental Damage
- Cost of Strategic Reserves for National Security
- Cost of Job Loss and Trade Imbalance
- Cost of Long-Term Climate Impacts

# Renewable Energy External Costs

~~Renewable Energy~~  
~~External Costs~~

Renewable Energy  
Side-Effects

# ~~Renewable Energy~~ ~~External Costs~~

## Renewable Energy Side-Effects

Secondary effects of renewable energy use that are usually highly positive and entail significant economic and environmental benefits.

# Renewable Energy Sample Side-Effects

- Cleaner Air
- Improved Health
- Increased Number of Persistent Jobs
- Economic Development
- Reduced Business Costs
- Increased Energy Security
- Reduced Military Obligations
- Reduced Environmental Damage
- Reduced Climate Change Impacts

Cost

~~Cost~~

Partial Cost or Full Cost



# ~~Cost~~

## Partial Cost or Full Cost

**Partial Cost**: An incomplete cost for a product or service that only accounts for production and distribution.

**Full Cost**: A true cost for a product or service that accounts for production, distribution, and side-effects.

# Proper Communication About Cost

- The **partial cost** of gasoline is \$3.00/gallon at the pump.
- The **full cost** of gasoline is \$3.00/gallon at the pump plus \$7.00/gallon for side-effect costs for a total cost of \$10.00/gallon.
- In other words the government is spending \$1+ Trillion/year to subsidize our nation's addiction to cheap gasoline.

# Proper Communication About Cost

- The **partial cost** to produce electricity is \$.04/kWh from coal and \$.08/kWh from solar.
- The **full cost** of electricity from coal is \$.04/kWh for production plus \$.04/kWh for side-effects costs for a total cost of \$.08/kWh.
- The **full cost** of electricity from solar is \$.08/kWh for production minus \$.03/kWh for side-effect benefits for a total cost of \$.05/kWh.
- In other words, solar electricity is the lowest cost source of electricity.

# Cheap Fossil Fuel

~~Cheap Fossil Fuel~~

Subsidized Fossil Substance

# ~~Cheap Fossil Fuel~~

## Subsidized Fossil Substance

Artificially low cost fossil substance made possible by massive public expenditures hidden in tax policies, government budgets, health-care costs, environmental clean-up, economic job loss, and national defense.

# Carbon Tax

~~Carbon Tax~~

Fossil Substance

Free-Market Adjustment



# ~~Carbon Tax~~

## Fossil Substance

## Free-Market Adjustment

Cost adjustment to ensure the government does not unintentionally impact **free-market forces** by neglecting the side-effect costs of fossil substances.

# Renewable Tax Subsidy

~~Renewable Tax Subsidy~~

Renewable Energy

Free-Market Adjustment

# ~~Renewable Tax Subsidy~~

## Renewable Energy

### Free-Market Adjustment

Cost adjustment to ensure the government does not unintentionally impact **free-market forces** by neglecting the side-effect benefits of renewable energy.

# Clean Energy Programs

~~Clean Energy Programs~~

Fossil Substance Abuse  
Treatment Centers

# ~~Clean Energy Program~~

## Fossil Substance Abuse Treatment Centers

Programs provided to help fossil substance addicts become economically, environmentally, and physically healthier by switching to clean energy alternatives.

# Fossil Substance Abuse Treatment Centers

- ENERGY STAR
- NAHB Green Building Standards
- LEED
- DOE Zero Energy Ready Home
- Passive House
- Living Building Challenge
- Architecture 2030 Challenge/Achieving 80x50
- World Wildlife Fund
- Environmental Defense Fund
- Climate Action Network

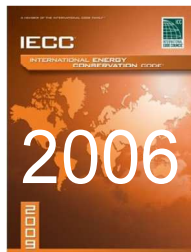
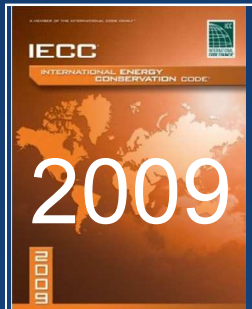


Doing Well by Doing Good...

## Zero Energy Ready Home Impacts:<sup>\*</sup>

- **~\$350 Billion** Utility Bill Savings
- **~120,000** Persistent New Jobs
- **~3 Million** Job-Years of Work
- **~2,800 MMTCe** Less Carbon Emissions

\* Internal DOE analysis assuming high-performance new and existing homes













Which brings up another power word...

Super Power











# Before Retrofit





# After Retrofit

Increased square footage from 1,800 to 3,300  
while reducing energy bill 33%



# Before Retrofit





# After Retrofit

Doubled square footage  
while reducing energy bill





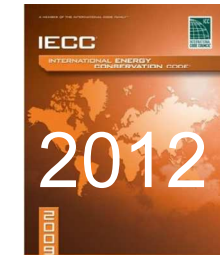
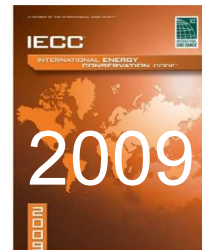
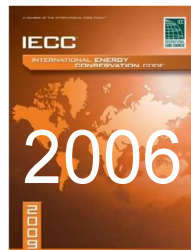
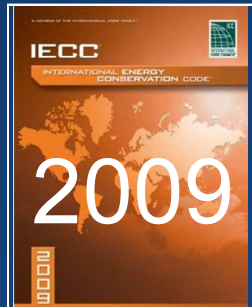




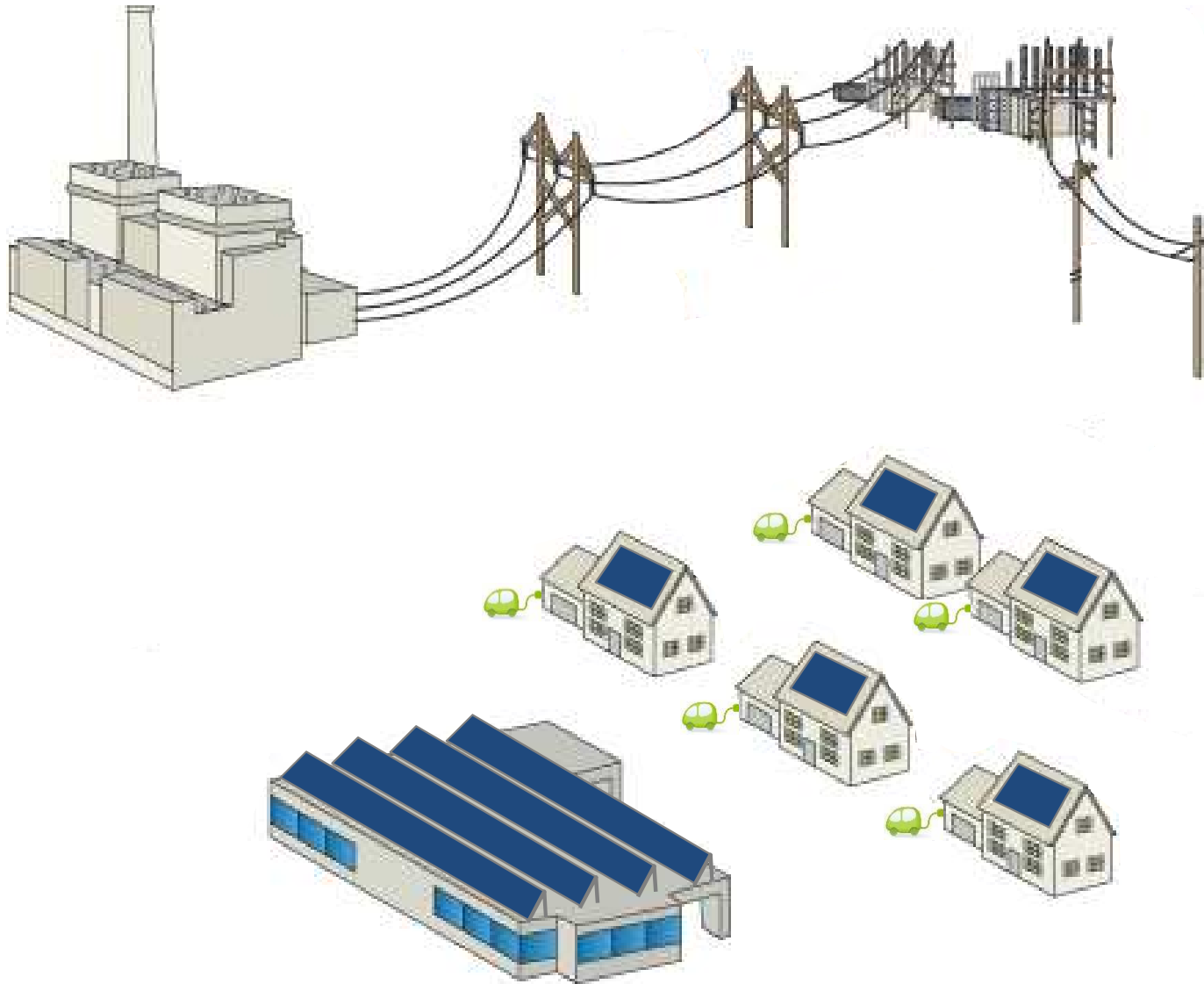
v3



v1 and v2



# Which Leads to the Home of the Future I Was Supposed to Talk About...



“The paradigm shift we are seeing now is that consumers have stopped being this dumb agent, where they receive a fixed electricity price and then consume at will.”

Ruben Lobel  
Wharton Professor



# Proper Use of the 'Term' Cost

- The **partial cost** is \$300,000 for a code home vs. \$350,000 for a zero energy home or **\$50,000 less partial cost, but...**
- The **full cost** including energy and health costs over the life of a mortgage is \$600,000 for a code home vs. \$400,000 for a zero energy home or **\$200,000 greater full cost.**















An aerial photograph of New York City, showing the dense urban landscape of Manhattan and the surrounding areas. The Hudson River is visible on the left, and the East River is on the right. The city is characterized by a grid of streets and numerous skyscrapers. The text is overlaid on the upper left portion of the image.

*“The earth is not inherited from our fathers  
but borrowed from our children.”*

Native Proverb