

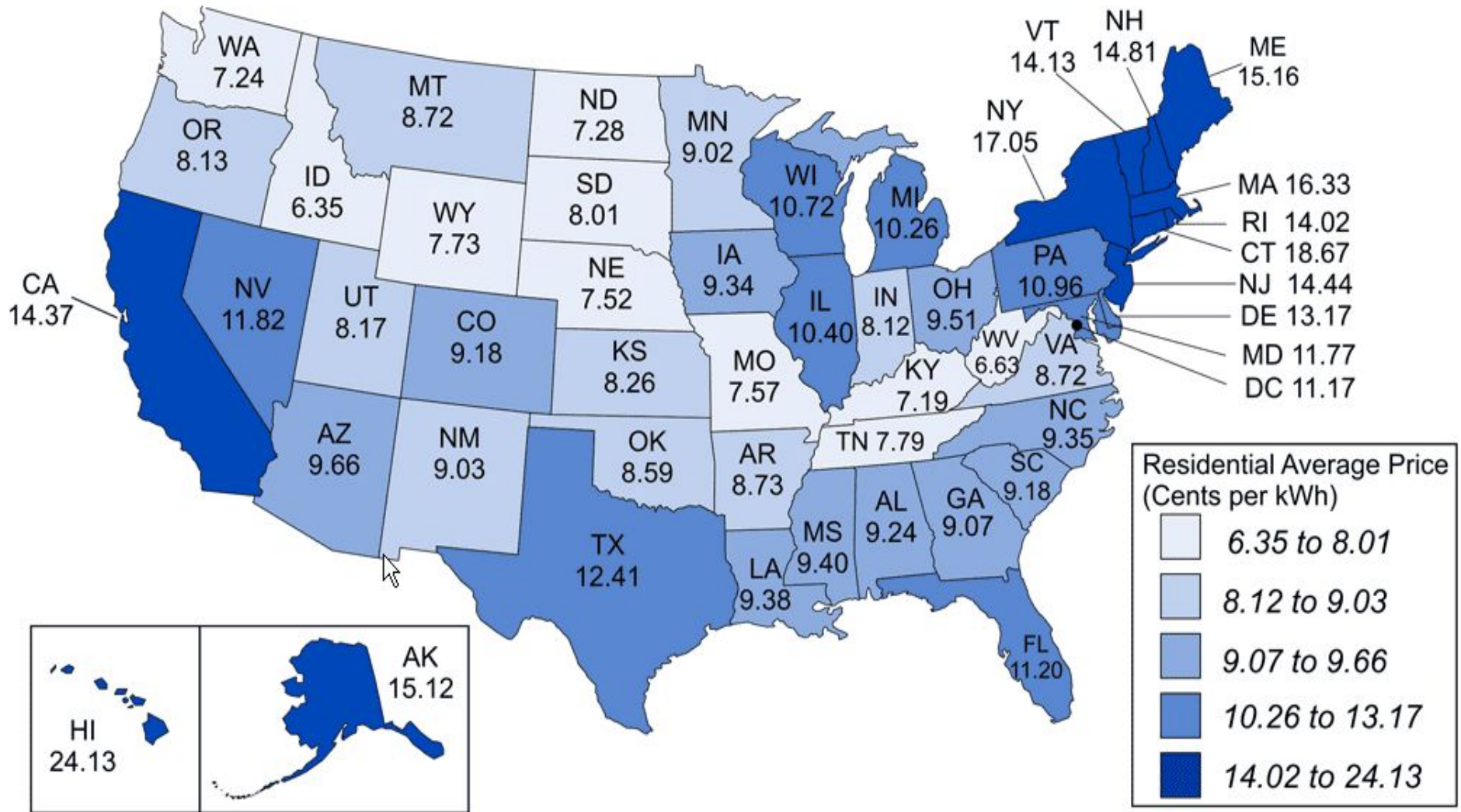
Real Costs of Energy, Efficiency & Sustainability

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The U.S. average residential retail price of electricity was 10.64 cents per kilowatthour in 2007.



Source: Energy Information Administration, Form EIA-826, "Monthly Electric Sales and Revenue with State Distributions Report."

Real Costs?

- Real Cost =

Cost on the consumer's bill + *Spillover cost*

Social Cost = Private Cost + External Cost

- KY Real Cost = 7.19 cents/kwh + ???

BP Deepwater Horizon Spill Gulf of Mexico - 2010



Oil on Pensacola Beach, FL June, 2010



TVA Ash Pond Dike Break Kingston Steam Plant - 2008



Massey Energy Upper Big Branch, Mountcoal, WV – April 2010



Are Spillover Costs Included?

Yes, but maybe not fully

- ***OIL SPILL:*** Regulations to protect, drillers' insurance costs; ban will increase rates on electricity bills.
- ***COAL ASH POND:*** Regulations, stricter?
- ***COAL MINING ACCIDENTS:*** Regulations, high wages

Energy Alternatives

- *Wind:* eyesores, sound & shadows
- *Solar:* climate & grid
- *Nuclear:* waste disposal & security risk
- *Hydroelectric:* ecosystems
- *Conservation:* demand management through higher prices

Efficiency



"Waste always makes me angry..."

—Rhett Butler in GONE WITH THE WIND.

Beware!

Snake Oil *n.*

A worthless preparation fraudulently peddled as a cure for many ills.

The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000 by Houghton Mifflin Company.

TANSTAAFL:

There ain't no such thing as a free lunch.

Efficiency in Energy Policy

Turn “hidden” spillover costs into costs reflected in the private bill; optimal consumption

- **Benefit Cost Analysis:** Balance

Increases in costs in private bills vs.

Increases in values of cleaner water and land & values of reductions in fatality and health risks

- **Market incentives:** Can keep increases in private bills under control

International Climate Change Policy & Market Incentives

- 1992 UN Earth Summit in Rio de Janeiro produced the U.N. Framework Convention on Climate Change
- 1997 Kyoto Protocol, signed in Japan, effective 2005
Market incentives

Kyoto Protocol

- **Emissions Trading:** trading of the national carbon quotas among countries listed in developed countries (Annex B)
- Joint Implementation allows developed countries to receive **Emission Reduction Credits** when financing projects in another developed country.
- (c) **Clean Development Mechanism:** developed countries finance emission reduction projects in developing countries and receive credit for emission reductions

Copenhagen Accord

- **Kyoto Deficiency:** absence of involvement in truly meaningful ways of the rapidly-growing developing countries, now better termed “**emerging economies**” – China, India, Brazil, South Africa, Mexico, and Korea.
- **Copenhagen Accord in December 2009:** Series of bilateral, eventually multilateral meetings
 - U.S. President Barack Obama
 - Chinese Premier Wen Jiabao
 - Indian Prime Minister Manmohan Singh
 - Brazilian President Luiz Inacio Lula da Silva
 - South African President Jacob Zuma

A Framework – no numbers

- “expanding the coalition of the willing and extending the time-frame of action.

With this step, all of the 17 countries of the Major Economies Forum – which together account for some 90% of global emissions – are agreeing to participate.”

- Robert Stavins, Harvard

<http://belfercenter.ksg.harvard.edu/analysis/stavins/?p=464>

Sustainability

Sustainability

- An Economist's Perspective
- Robert Solow, Nobel Laureate, 1987
- Contributions to theory of economic growth, optimal investment
- **“Leave future generations the capacity to be as well off as present generation”**

Obligation to the Future

- UNESCO: Leave air and water pure as when it came to earth, species undiminished
- Solow: Can't be morally obligated to infeasible
- *If we use something now, provide something of equal value for the future,
If we consume something now, invest in something of equal value for the future*

Real Costs of Energy Efficiency

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Sustainability