Here We Go Again: Lessons from Previous Energy Crises and What is Different this Time?

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“Those who do not learn from history are doomed to repeat it”
George Santayana

“If history repeats itself, and the unexpected always happens, how incapable must Man be of learning from experience?”
George Bernard Shaw
"... BUT FIRST, LET'S HEAR YOUR POSITION ON THE ALASKA PIPELINE AND INDEPENDENT GAS DISTRIBUTORS!"
Regular Gasoline Dollars per Gallon, In Today’s Dollars

$2.69, March 1981
U.S. Invades Iraq

$1.50
Iran Rev
Ruble Collapse

$1.00
OPEC Oil Embargo
Iraq-Iran War Starts
Iraq Invades Kuwait

$0.50

$0.00

Source: EIA as compiled by zFacts.com (2005$)
Energy Crises: Nothing New

- 1865: Jevons writes *The Coal Question* – running out of coal
- 1954: Harrison Brown: *The Challenge of Man’s Future*
- 1956: UN Report says *Europe will face energy crises unless nuclear power becomes widespread*
- 1970: F.P.C.'s Head Warns Power Shortages Are Possible Next Winter
- 1972: Natural Gas shortages in US lead to scramble for coal
- 1973: Arab oil embargo of US and Israel-friendly countries
- 1978: Iranian revolution
- 1986: Oil price collapse – Saudi’s give up
- 2000-1: California Electricity crisis
- 2003: US invades Iraq and oil prices rise
- 2005: Crude prices hit $70 a barrel
Some Background Questions

- What types of energy do we use?
- What do we use energy for?
- Where do we get our energy?
- What is going on in the rest of the world?
- What have been the big changes over the past three decades?

See background info in your briefing book!
US Oil use and imports

Where from ➔
What happens in the world explains a lot about the price of oil.

China:

![Chart showing oil production and imports for China, with projections to 2025.](chart.png)

Source: EIA
What is the “Crisis” in “Energy Crisis”? Prices, supply and import dependence

- Prices – going up, going down, remaining fixed, jumping around
- Supply – physical shortages not common but can occur (eg, 1973 gasoline lines; 2001 Calif. Electricity outages)
- Import dependence and foreign policy (eg, war in Iraq)
Issues in 1970’s

• Physical shortages in 1973 due to embargo (and price controls)
• Distributional issues
  – Burden on poor (eg, heating oil)
  – Regions of country burdened differently
  – Inflation exacerbated by oil price increases
• Environmental consequences of expanded domestic energy production
• R&D inadequate to address problem
• Technologies disappointing – nuclear, synfuels
• Economy does not always respond properly to price signals on energy scarcity – economy slow to adopt fuel efficient measures
'HENRY — IT'S THE THERMOSTAT POLICE!'
70’s Generic Government Responses

- Increase reliance on market
  - Deregulate oil and gas (c. 1980)
  - Increase market for alternative electricity -- PURPA
- Decrease reliance on market
  - Oil and gas price controls with windfall profits tax
  - Average cost pricing for regulated gas and electricity utilities
  - Subsidies for adopting energy saving technologies
- Actions outside the market
  - Fuel efficiency standards for appliances, cars
  - Federal energy R&D program
  - Reduced highway speed limits
  - Information programs
  - Targets (eg, renewable portfolio standards)
  - Moral suasion (Jimmy Carter and his fireside chats)
  - Grants to help with heating oil costs for lower income folks
  - Strategic Petroleum Reserve to buffer price shocks
The Effect of California’s Actions in the 1970's
Maybe it is just migration to balmy climates

**Population Weighted Cooling Degree Days, Trends: California v. Nation**

Source: National Climatic Data Center/NOAA
Historical Climatography Series NO. 5-1 and 5-2

- **1951 - 1980 Normal Periods of Record**
  - California
  - Nation

- **1971 - 2000 Normal Periods of Record**
  - California
  - Nation
Prices played a role

National v. California Electricity Prices

(Prices per kWh in 1999 dollars)

Source: EIA State Energy Data 2001: Prices and Expenditures

<table>
<thead>
<tr>
<th>Year</th>
<th>Price per kWh</th>
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<tbody>
<tr>
<td>1970</td>
<td>0.08</td>
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<tr>
<td>1975</td>
<td>0.10</td>
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<tr>
<td>1980</td>
<td>0.12</td>
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<tr>
<td>1985</td>
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<td>2000</td>
<td>0.20</td>
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The graph shows a comparison of electricity prices per kWh in 1999 dollars for the nation and California from 1970 to 2001. The prices for California are consistently higher than those for the nation in most years.
As Did State Government Policies

GWH Impacts from Programs Begun Prior to 2001

~ 14% of Annual Use in California in 2001

Utility Programs

Building Standards

Appliance Standards

Source: Mike Messenger, CEC Staff, April 2003
The Message

1. States can’t change the price of oil

2. States **can** prepare their citizens and firms to buffer gales of energy markets
The 1970’s: what worked?

and what didn’t?
What worked

• Price signals worked wonders for energy savings – high prices get responses
  – BUT, downside of high prices significant
  – State levers: Utility regulation; gasoline taxes

• Actions to improve markets also work well
  – PURPA an important policy action in late 1970’s
  – State levers: policies that affect energy industries within your state

• Technology-forcing standards worked well
  – Automobiles, appliances, houses
  – State levers: R&D policy that rewards work in state

• Programs to buffer disruptive effects of price rises and disruptions are important tools
  – State levers: Public transport and heating oil assistance

• Conservation just as important as supply augmentation
  – Efficiency standards
  – State levers: building standards, electricity demand side management
What Didn’t Work

• Price signals didn’t always work
  – Consumers don’t seem to buy “enough” efficiency

• Efforts to protect everyone from higher prices
  – Create significant problems – end up failing; eg,
    • NatGas price controls in early 1970’s
    • Oil and gas controls in 1970’s vis-à-vis domestic prodn

• Relying on direct funded applied R&D
  generally disappointing – eg, PNGV, synfuels

• Technology fixes – looking for the golden technology that solves all problems

• SPR not very effective
Issues of the 1980’s

- Energy prices high in early 1980’s – nothing much done
- Big change: oil price collapses in 1986
  - Oil companies “hurt”
  - States big in energy lose revenue
  - Cars and trucks start to get bigger
  - Energy conservation takes big hit
  - Energy R&D suffers
- Government policy not prominent
- Environment and energy takes center stage
  - Sulfur from electricity generation a big issue
  - 1987: hot summer -- climate change rises in import
Case Study: CAFE

[CAFE = Corporate Average Fuel Economy Standards]

• Steady increase in fuel efficiency during 1980’s
• CAFE: Technology forcing or is it simpler?
• Auto Company response to CAFE – apply a “feebate” internally
  – Small cars get a subsidy – people buy more
  – Large cars get “taxed” internally – people buy fewer
• Suggests a powerful regulatory option
  – Zero-net-revenue incentives to move behavior
80’s: What worked; what didn’t?

What worked
• Efficiency standards (eg, CAFÉ)

What didn’t
• Federal investment in Energy R&D
• Extending Clean Air Act to Acid Rain
Issues of the 1990’s

- Climate emerges as the new energy problem
- Clinton tries a very modest energy tax – fails
- EU tries a very modest energy tax – fails
- Iraq-Kuwait: War in the Middle East
- Oil prices plummet – below $10/barrel in 1998
- Oil producers hit very hard; consumers boom
- Deregulation mania takes over electricity (Cal strikes out – other succeed)
- Continuing cheapening of oil causes problems for conservation
A Case Study: the Golden Carrot

- Consortium of utilities & NRDC pool $30 million
- Competition to build a super-efficient, CFC-free refrigerator
- Winner gets rebates on sales
- Whirlpool won
What Worked

• Cap and trade systems for pollution from electricity generation
• States take lead in climate change policy
What Didn’t Work

• Energy tax (US or Europe)
• Policies to curb GHG emissions
• Tightening auto fuel economy standards when energy is cheap
• Command and control efforts to conserve energy fall on hard times
  – Speed limits
  – CAFE
Issues of the 21st Century

• Auto fuel economy big issue (red vs. blue?)
• World demand and weak dollar pushes up price of oil/gasoline to record levels (get used to it!!)
• Climate change
  – Bush pulls US out of World agreement
  – States take the lead in US
• US invades Iraq in part to secure oil
• Temporary disruptions due to hurricanes and other natural disasters – disrupt refining capacity temporarily
• Push for supplies puts pressure on environment (ANWR)
• Deregulation of electricity can lead to big problems (eg, California electricity crisis of 2001 brings down Gray Davis)
Choose the Patriot

GOD BLESS USA

AMERICA STAND UP AMERICA

13 MPG

38 MPG

12/7/01
What have we learned?

• High energy prices come and go (mostly come)
• The market works wonders in many cases – use it
• The market isn’t enough in some important cases
  – Pushing technological improvements in efficiency
  – Getting people to buy energy efficiency
• Government (fed & state) has a role in preparing citizens for next price spike
  – Reducing energy share in personal budgets
  – Buffering lower income folks from price rises
• States can play an important long-run role in reducing energy dependence (feds not necessary)
• Direct government investment in R&D disappointing
• Efficiency standards have been very effective
• Market restructuring can yield large energy gains
States: a few lessons for action

• Priority: work to increase the efficiency of our energy-using, long-lived capital stock
  – Automobiles, buildings, major appliances
  – Regulated utility sector effective and can be used proactively
  – Provide positive and negative incentives to consumers
    • Tie auto registration fees to fuel efficiency in a revenue-neutral way
    • Use revenue-neutral fees to promote appliance efficiency
  – BUT, be prudent in how subsidies are “thrown around”
• Rolling back gas taxes poor way to address price rises
  – Build programs to buffer the most vulnerable from price fluctuations
• Build citizen consensus to reduce energy consumption and be willing to shoulder higher prices in exchange for tangible benes
• Markets can be helpful in energy policy but deregulation of electric power should be pursued with care
• Discourage sprawl – substitution of gasoline expenditures for housing expenditures
Questions??

For a copy of this presentation:

www.ckolstad.org

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