Gary Tobey

- Retired lawyer – 45 years
  - Business, real estate, natural resources, contract matters and legislative and governmental relations
- Navy Carrier-based Nuclear Delivery Pilot – Vietnam Era
- Civil Air Patrol -- 40years
- BA University of Rochester 1964
- Juris Doctorate – University of Denver

A Little Nuclear History

- Cousin Marion Harrison, crane operator, Los Alamos

USS Enterprise

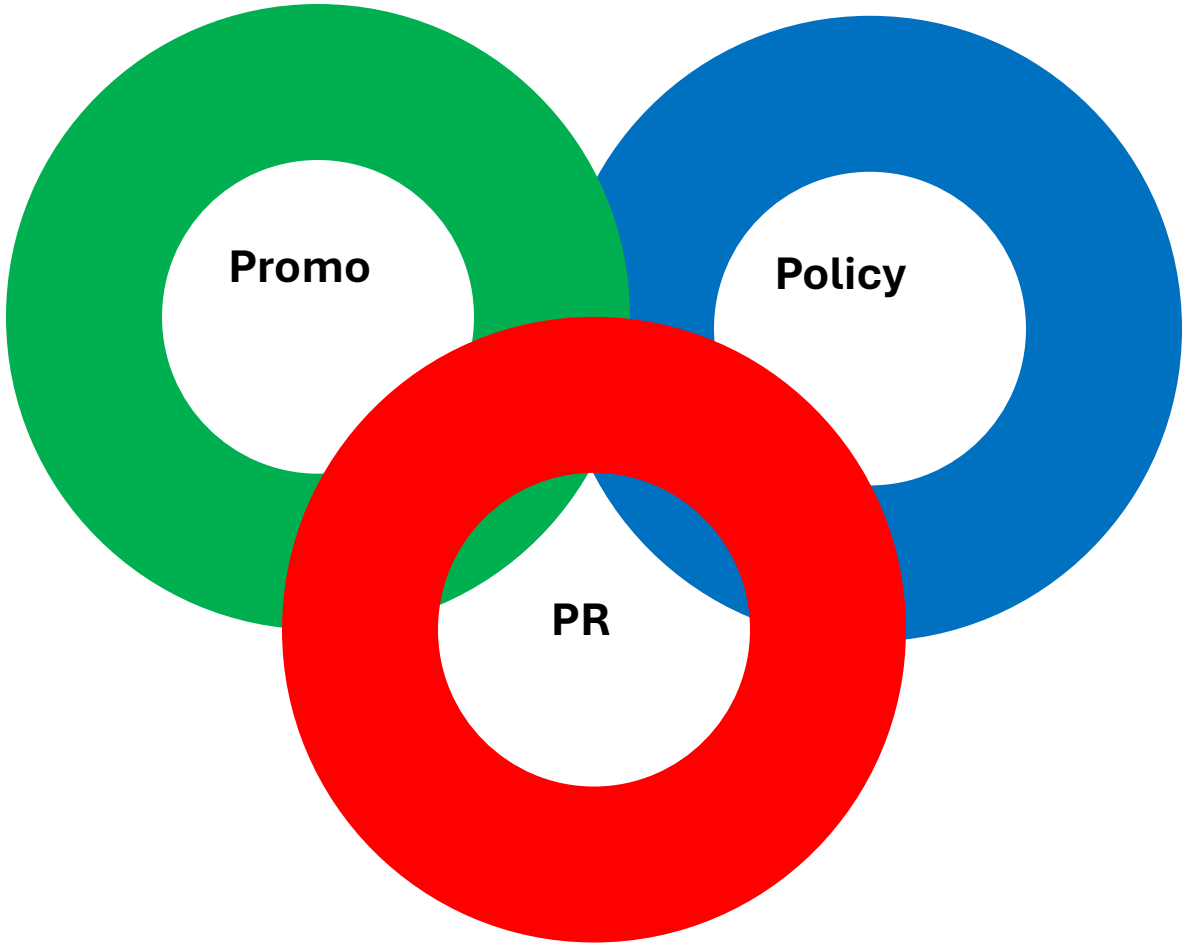
Navy Nuclear Delivery Pilot

Vicarious knowledge as lawyer

The Energy Source Progression

- Wood
- Whales
- Coal
- Oil
- Gas
- Nuclear Fission
- Wind and Solar
- Nuclear Fusion

The Players



Policy

Energy, The Environment, and The Economy are All Interlocked

Policy usually follows technology

- **House Bill (Fusion regulation will wait ‘til we know more)**

Policy tends to overregulate

Need a cooperative environment

- **With Industry participation**
- **DOGE – Musk & Ramaswamy?**

Government Regulations

Government must have something to regulate

Not only do they not understand, but they don't understand that they don't understand. And that's a whole new level of ignorance.

A Good Message With Baggage

Global Climate Change

Stop, look and listen before we leap

International efforts to deal with climate change are lurching from speculation toward actions that could wreak havoc on nations even as the underlying science and economics continue to signal caution.

While governments have agreed that there may be reasons for concern over the buildup of greenhouse-gas emissions, primarily carbon dioxide (CO_2), there is no consensus on what constitutes "dangerous levels" of emissions nor is there agreement on when, where and how best to reduce their impact. Yet, an action plan with binding commitments on developed nations could take shape by year's end.

We are concerned that policy makers are not considering the implications of controlling CO_2 emissions. Studies have examined some of the emission-control plans tabled to date and concluded that they will impose painful burdens on developed economies, particularly if timetables are short and targets unrealistic. For Americans, such solutions mean jobs will disappear and lifestyles will be pinched as our industrial infrastructure shrinks.

A study just issued by Charles River Associates (CRA) provides additional weight to the impact of emission controls in an age of global markets. The report shows how ill-timed or ill-considered abatement measures could stunt world economic growth, unsettle global trading patterns and set the stage for a new era of trade protectionism.

CRA analyzed two abatement scenarios—one a more modest stabilization proposal, the other a more aggressive reduction plan. Both policies appear to fall within the boundaries of acceptability by the U.S. government. The authors utilized a carbon-rationing plan to achieve required reductions in CO_2 emissions. In practice, rationing will increase energy prices for both industry and the consumer.

The cost of limiting emissions could range from $200 to $580 per ton of carbon, depending on the timing and severity of the plan selected. To put this in perspective, this equates to an additional cost to consumers of 50 cents to $1.50 per gallon of gasoline in today's dollars.

The expected blow to U.S. prosperity would be considerable, according to CRA: an annual drop in gross domestic product ranging from $105 billion in the year 2010 to $460 billion in 2030, both in today's dollars. At the lower range, this works out to a loss in annual household income of roughly $1,000.

One key finding of CRA's study is that the economic burden of emissions controls is borne not only by the industrialized countries, but also by developing societies, who under current proposals need do nothing. The developed world feels the pain as it is forced to switch fuels and revamp its industrial infrastructure. The developing world, which now exports 60 to 75 percent of its products to industrialized countries, will see those markets shrivel as economic growth stalls and demand for protectionist measures grows. Developing countries that import energy will benefit from lower fossil-fuel prices, but in most cases that gain won't offset the loss of trading markets. And energy exporters—be they developed or developing—will be particularly hard hit as energy markets shrink.

The CRA study injects a healthy dose of realism into the climate-change debate. In the coming months, we'll continue to look at what other experts are saying. Meanwhile, we urge international policy makers not to make 1997 a year of hasty decisions. The entire world's prosperity depends on a course of wise, sustainable action.

Mobil The energy to make a difference.

http://www.mobil.com

The Messenger is just as Important as the Message

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NATIONAL GEOGRAPHIC SOCIETY

PR and Promotion

An Industry Responsibility

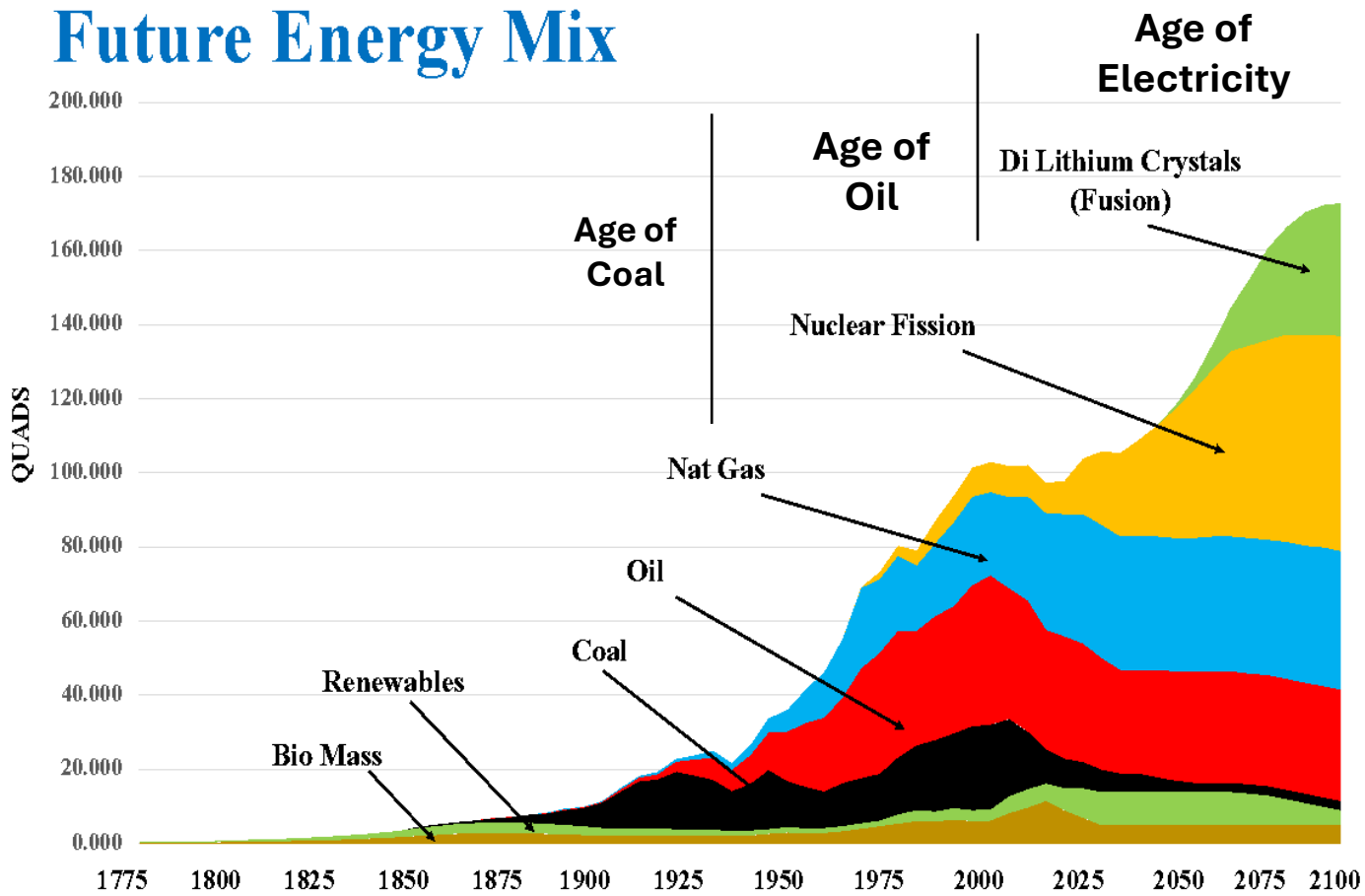
Putting your money where your mouth is demonstrates credibility

An ongoing Public Education effort

“Protest Fossil and Promote Fusion”

We have a good start

Future Energy Mix



And now, Controlled Nuclear Fusion

- **Lawrence Livermore National Laboratory**
- **Massive laser machinery – one of several possibilities**
- **Big laser shot, producing more energy from fusion**

Commercialization

- **Yeah, but can we make a profit?**
- **One report has 130 programs globally that are putting their money where their mouths are on fusion for electrical generation**
- **The Demand – John's Intro**
- **See Artificial Intelligence Workshop this morning**
- **Bitcoin**
- **Quantum computing**

Rational or Irrational Exuberance

- **The DEMAND**
- **The need for MASSIVE SUPPLY**
- **Nucor Steel/Helion**
  - **300 MW electric generation plant**
  - **Energy from fusion**
  - **Cost in the $5B plus range**
  - **Commercial in 5 years**

Rational or Irrational Exuberance, cont.

- **Open AI's Sam Altman says electric demand will double from 200 TWs to 400 TWs by 2030**
- **Urgent Data Center demand – Microsoft / Three Mile Island -- back to fission -- Google, Amazon**
- **Xcel Energy closing coal-fired facility – gas, then fission; maybe Small Modular Nuclear Reactor (SMR); how about Fusion?**

The Government

- **Lawrence Livermore, one of 17 research labs under the Department of Energy**
- **National Renewable Energy Laboratory, Boulder**
- **Government regulations – Impact of Trump Administration**
  - **Chris Wright – Department of Energy**
- **Government contracts – Usually ponderous procedure**
- **Public Utility Commission**

Show Stoppers

- **Impact on all electric generation entities**
- **Intrenched industries**
- **Vested interests (whose ox is being gored?)**
- **Reliable transmission – The Grid -- Wire**
- **National Energy Regulatory Commission or its follow-on**
- **It’s still nukes**
- **It’s still water**
- **Stranded assets**