

B. Delphi Analysis

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The following pages present the slides from the Delphi presentation at the conference. A discussion appears in Volume 1. A transcript of the presentation itself and the conference discussion can be accessed at <http://www.rand.org/scitech/stpi/Evision/Transcripts/Day1-am.pdf>.

Futures Methodologies (TFI taxonomy)

- Extrapolation
- Pattern Analysis
- Goal Analysis
- Counter Punching
- Intuition
 - Delphi Survey
 - Nominal Group Conferencing
 - Structured and Unstructured Interviews
 - Technology Advantage Management

Modified Delphi Technique

- Original Delphi Technique (1963)
 - Anonymous response
 - Iteration and controlled feedback
 - Statistical group response
- Modified Delphi Technique
 - More qualitative
 - Anonymous response
 - Iteration and controlled feedback

Setup for Modified Delphi

- "You have it on unimpeachable authority that a time traveler will appear to early in the new millennium. That traveler comes from 20 years in the future knows everything you could possibly want to know about the situation surrounding energy needs in the year 2020. You will get to ask that time tra 10 questions about that future. The single drawback to this extraordinary situation is that the time traveler is mute. S/he can only nod yes or no to questions."
- Round 3 - reduced to six questions

Participants

- Private Sector/Industry Traders (8)
 - American Electric Power, Ford, Weyerhaeuser, Robert Charles LeseMcDonough and Partners, SAIC, Gas Research Institute
- Government (6)
 - National Energy Technology Laboratory, National Renewable Energy Laboratory, Former Presidential Science Advisor, Oak Ridge National Laboratory
- Academia/Other Non-Profit (13)
 - Colorado School of Mines, International Research Center for Energy and Economic Development, University of Houston, American Council for an Energy-Efficient Economy Chairman of the Energy Foundation, Arizona Corporation Commission, Center for Energy and Climate Solutions, Sigma Xi, University, Carnegie Mellon University, Resources for the Future, CONSAD Research Corp., James Madison University

Results

- Consensus?
- By question
 - *And participant's institutional affiliation*
- By question-area
- Support for EERE categories

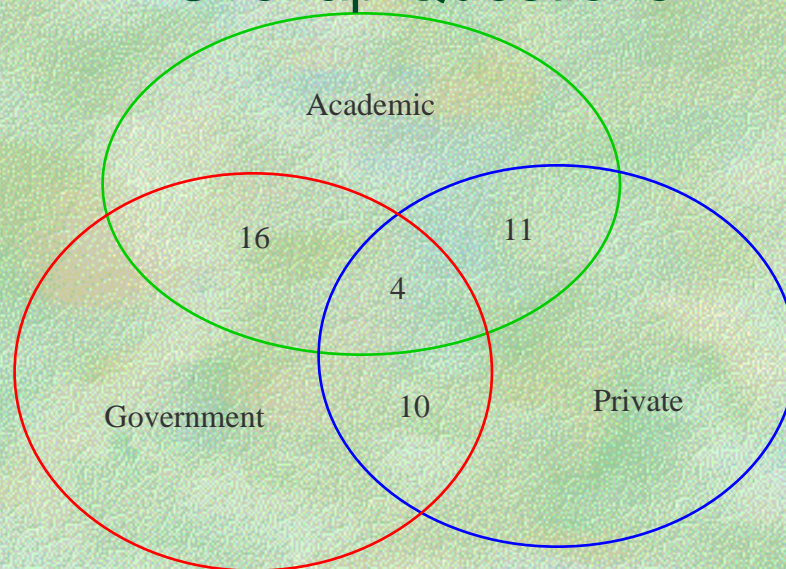
Was Consensus Reached?

- There was some convergence
 - *R#1 - 262, R#2 - 185, R#3 - 99 (< 111)*
- Little consensus on by-question basis
- Much greater consensus on question-area basis

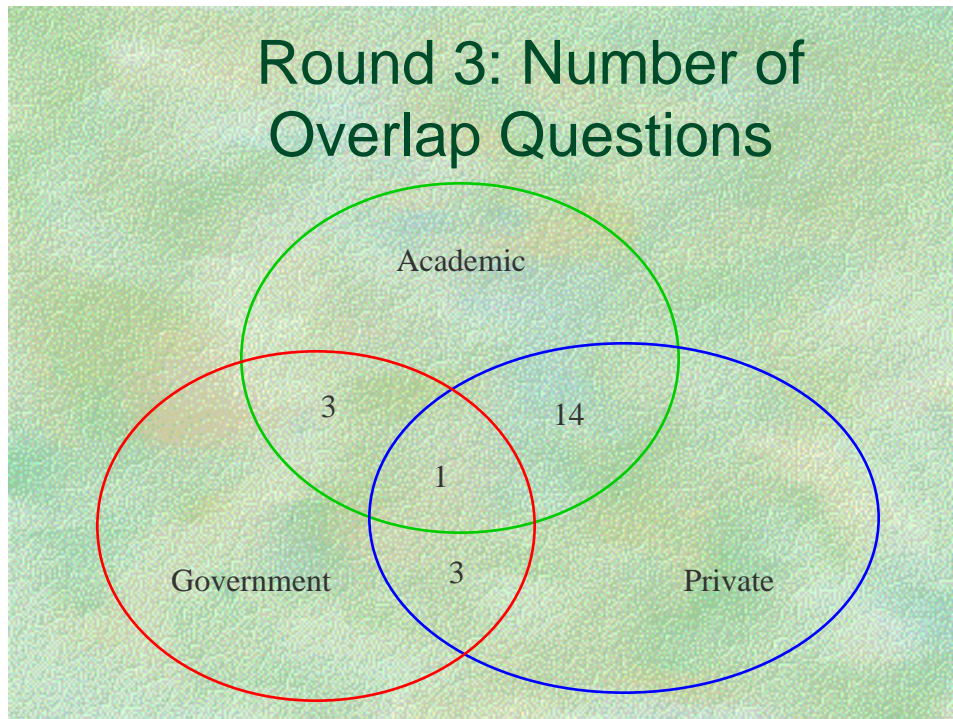
Round 3: By Question Results

- Only one question got as many as 4 votes
 - “Within the U.S. transportation sector, is the market share of hybrid and zero-emission vehicles 20 percent or greater?”
- Nine got three votes
- Eighty got only one vote

Round 2: Number of Overlap Questions



Round 3: Number of Overlap Questions



Round 3 by Question Area

- Global warming and GG emissions (27)
- Hybrid/zero-emission vehicle penetration (13)
- Natural gas usability/use (11)
- Fuel cell viability (7)
- Increased nuclear use (7)
- Oil prices (7)

Maximum Overlap Questions

- Round 2
 - Has the price of natural gas risen by more than a factor of 3 between 2008 and 2020?
 - Is the cost of petroleum greater than \$45 per barrel in 2020?
 - Has the theory of long-term global warming and climate change by anthropological activity been validated and generally accepted?
 - Is Industrial Carbon Management practiced on a commercial scale expressly for the purpose of limiting emissions?
- Round 3
 - On average, over the period 2000 to 2010, has the price of petroleum remained largely constant when adjusted for inflation?

Support for "Other" EERE Categories

- Energy Security - 6 (R#3 questions asked)
- Smart Growth - 1
- Transportation - 15
- Hydrogen Economy - 8
- Demographic/Population Growth - 5
- Environmental Laws - 12
- Distributed Power - 2

Inferences

- By far, the greatest concern is global warming and CO₂ emission control
- Among technologies, natural gas, fuel cells and nuclear power draw greatest interest
- Clear support for EERE's concerns with the future roles of transportation/energy and environmental law

Strategic Planning Notes

- Delphi participants are generally more concerned about the context of the future than the technologies
- Context concerns speak both to threshold events worth more thought and monitoring, and important scenarios worth working through

