

Measuring the Quality of EIA Analysis: A Revised Approach, Bill Weinig, SMG, EIA This revised survey approach was developed by a team of Stan Freedman, Team Leader, Howard Bradsher-Fredrick, Tom Broene, Inderjit Kundra, Herb Miller, Renee Miller, Joseph Sedransk, Phillip Tseng and Bill Weinig, SMG, EIA.

1. Background:

The first of three goals in EIA's Strategic Plan for 2004-2008 states that, **"EIA's information program is relevant, reliable and consistent with changing industry markets and EIA's information products will retain or improve their high quality and timeliness.**

EIA has been conducting surveys and employing other methodologies to assess the quality, timeliness and other attributes of EIA products for a number of years. However, a systematic quantitative assessment of EIA analytical products had not been conducted. In a paper presented to the Committee last fall, we proposed to survey a limited number of subject matter experts who review EIA draft products. These we would contact through the Independent Expert Review program and 2 reviewers under contract to the Statistics and Methods Group. Seven questions with definitions of terms were designed to solicit responses from these reviewers. At the fall 2003 meeting, we shared this approach and the proposed questions, and asked the Committee for advice.¹

The Committee response was that the survey questions were comprehensive and balanced. However, the questions were fairly complex and open to some range of interpretation. EIA's use of definitions in the proposed questionnaire suggested this too. The small sample size of outside reviewers could lead to fairly unstable results. While the survey form supported tabular results, the results were not likely to provide rich information. If this limited survey approach was important, the Committee suggested EIA consider open-ended questions, and a qualitative evaluation. Independent reviewers might be good at qualitative evaluations, and might be surveyed through Independent Expert Review contracts at intervals after their reviews. The committee was mixed on the value of keeping the reviews anonymous, and was generally not supportive of the survey in its current methodology or form.²

2. EIA reactions to the ASA Committee's advice:

2. A. A Summary of EIA's Response to Advice at the Fall 2003, Meeting

Since the fall 2003, meeting, we have:

- (1) replaced the original 7 questions with 17 more narrowly focused questions and 2 open-ended questions, 1 at the end of each survey section,
- (2) eliminated the imbedded definitions in the original questions, and
- (3) otherwise maintained the scope of the original survey.

¹ The paper and proposed questions may be reviewed on last fall's ASA/EIA meeting home page at:
http://www.eia.doe.gov/smg/asa_meeting_2003/fall/

² The complete summary of advice and response to the fall 2003 meeting may be found on EIA's Home page under Energy Events, Summary of Advice from the American Statistical Association:
http://www.eia.doe.gov/calendar/asa_overview.htm

Also, we reviewed the previous survey methodology, and replaced the limited number of intended survey recipients (approximately 10 reviewers of EIA products) with a much larger group of EIA's analytical customers (those registering to attend the spring 2004 National Energy Modeling System Annual Energy Outlook Conference in March, 2004).

2. B. EIA's Detailed Responses to ASA Advice

This paper is about the revised survey methodology. (The revised questions may be found in Attachment 1.)

Responding to the Committee's advice to broaden the survey, the team chose to survey users of EIA's two main analytical publications, the "Annual Energy Outlook" and the "International Energy Outlook." These 2 publications are considered to represent EIA's broader range of analytical products, and recognized and used by the widest audience of EIA's analytical customers.

(Other important analytical products, such as EIA's Service Reports, typically respond to Congressional requests to study proposed legislation. These studies typically compare proposed legislation to EIA's base case in the Annual Energy Outlook (AEO). This audience is narrow, difficult to reach and survey, and is thought to be closely akin to EIA's other analytical customers anyway.)

The AEO is based on forecasts from the National Energy Modeling System, EIA's mid-term analytical model, forecasting to 2025. The AEO and the International Energy Outlook are discussed at an annual 1-day conference and agency sponsored. The conference, called the National Energy Modeling System/Annual Energy Outlook, was held in Washington, D.C. on March 23, 2004.

Based on past experience, EIA expected approximately 500 people at the conference. To register, one was asked to provide name, title, organization, address, phone, fax and email. The conference was free.

Registrant names, email addresses and phone numbers were provided to the Survey Team electronically by EIA's Office of Integrated Analysis and Forecasting, who managed the conference.

So an effort was made to hold the survey mailing list cut-off as long as possible. This (1) minimized those potentially "different" participants from the main group, and (2) kept the survey population as close as possible to the total expected conference attendance.

Survey names, email addresses and telephone numbers were transferred to the team electronically. This allowed last minute transfer, insured the accuracy of the information and minimized the time needed for the information transfer.

The electronic survey mailing and the survey instrument were pre-tested March 1, to approximately 12 EIA staff to see if the survey could be received, if questionnaires could be completed, if the responses could be returned and if responses could be read. On March 2, the pre-test was evaluated and judged successful. No revisions were needed.

On March 4, the survey was sent to 397 conference registrants received as of March 1, 2004. There were 42 responses in 3 days for a 10.6 percent response rate. After several days, the list was purged of

respondents and a second emailing went to the reduced list. The results of these and a third wave of mailings may be seen in Table 1 below.

Table 1: Respondents to March EIA Analytical Survey Mailings

Mailing:	Number of Response	Percent Response	Cumulative Respondents	Cumulative Percent Response
March 4	42	10.6	42	10.6
March 9	39	9.8	81	20.4
March 11	47	11.8	128	32.2

Answers from the first round of respondents were compared to those from the rest of the respondents and no significant differences were found.

We had considered sampling at the conference. But this was considered very awkward. The logistics associated with finding and surveying specific individuals in a meeting of 500 individuals without a central registration desk or a location to pick up materials (done in previous years) led us to believe there was no effective way to contact a sample audience. Further, the schedule was very compressed leading participants to have limited time to complete surveys. The team decided that no further sampling should be conducted at or following the AEO/IEO/NEMS Conference.

Some team members thought it would be worthwhile to attempt one follow-up using an alternative mode. Thus, on March 19 and 22, a sample of approximately every 6th non-respondent was selected and their names and phone numbers were given to two SMG contract employees to do follow-up calls. The sample selection and results to the follow-up calls follow in Table 2:

Table 2: Post Email Sample Selection and Survey Results

Sample Selection:	
Original total sample base	397
Reduced by previous responses	128
Reduced/revised sample base	269
New Telephone sample base	50 (18.6%)
Survey Results	
Calls attempted	32
Responses (4):	
Completed	3
Didn't know enough to respond	1
Non-Responses (Declines, can't reach, no call backs, wrong number and promised to call back but didn't)	28
Calls not attempted (ran out of time)	18

3. The Survey Results and Findings:

The survey results may be found in **Attachment 2: Table of Results: Abbreviated Questions and Descriptive Statistics**. Highlighting these results, the survey found that the respondents evaluated EIA's analytical products as follows:

1. 132 Respondents answering the survey (email and by phone)
2. 19 stated they were not familiar with the AEO and the IEO
3. Therefore, 113 respondents provided at least some information.
4. On a 5-point Likert scale, averages varied from a low of 3.37 on the AEO ("The methodology is suitable to the analysis Petroleum Refining.") to a high of 4.31 ("The AEO is relevant."). This range of answers is indicative of products that are generally well liked and acceptable to the evaluators.
5. Survey responses by mailing:
 - 1st mailing: 42 respondents
 - 2nd mailing: 39 respondents
 - 3rd mailing: 47 respondents
 - 4th attempt (phone calls): 4 respondents
6. Comparison of responses to all questions of those submitting answers after 1st mailing & before 2nd mailing to those submitting answers following the 2nd mailing:
 - No significant differences (at 0.05 significance level)
 - This provides some evidence that non-respondents are not different from respondents.
7. Comparison of experts³ (n = 44) with non-experts for the AEO:
 - One question was significant at the .05 level: Q1. "The AEO is used extensively in my work."
 - Averages: 4.11 experts,
 - 3.70 non-experts.
 - This should be expected.
8. Comparison of experts⁴ with non-experts for the IEO. (13 experts and 19 non- experts). Questions resulting in significant differences are the following:
 - Question #1: "The IEO is used extensively in my work."
 - a. Averages: Expert: 3.82
 - b. Non-Expert: 2.89
 - c. Difference significant at the 0.10 level
 - Question #2: "The IEO is clearly written."
 - a. Averages: Expert: 4.33
 - b. Non-Expert: 3.75
 - c. Difference significant at the 0.01 level
 - d.

³ Experts were operationally defined as respondents answering one or more questions evaluating the AEO NEMS methodology.

⁴ Experts were operationally defined as respondents answering one or more questions evaluating the IEO NEMS methodology.

4. Two Questions to the Committee:

1. Do EIA's responses appear adequate to meet suggestions and criticisms at the fall 2003 meeting?
2. If this survey is needed every year, is there a way to avoid overworking our respondents?

Attachment 1:

OMB No. 1901-0302

The Energy Information Administration is conducting an e-mail survey of customers who registered for our upcoming NEMS Conference. This short survey will take about 5 - 10 minutes to complete.

The purpose of the survey is to determine the level of satisfaction with two of EIA's major products: The *Annual Energy Outlook* and the *International Energy Outlook*. We are interested in your feedback.

To take this voluntary survey now, please **click the reply button** to this e-mail and add your responses to the questions below. Your participation is voluntary and your responses are confidential.

EIA PRODUCT SURVEY

Are you familiar with the *Annual Energy Outlook*?

If Yes, continue at A. *Annual Energy Outlook*.

If No, go to B, *International Energy Outlook*.

If unfamiliar with either publication, stop here. **Please click the reply button and send your e-mail reply to EIA.**

Thank you for your time.

A. *Annual Energy Outlook*

Because analyses by the Energy Information Administration (EIA) are required to be policy-neutral, the projections in the *Annual Energy Outlook 2004 (AEO2004)* are based on Federal and State laws and regulations in effect on September 1, 2003. The potential impacts of pending or proposed legislation, regulations, and standards—or of sections of legislation that have been enacted but that require funds or implementing regulations that have not been provided or specified—are not reflected in the projections.

Use a scale from 1 to 5, with 5 meaning that you strongly agree with the statement; 4 meaning you agree; 3 meaning you are neutral, 2 meaning you disagree; 1 meaning you strongly disagree with the statement. If the answer is “Don’t Know”, please answer using a 6.

Strongly Disagree		Neutral		Strongly Agree	
1	2	3	4	5	6 (Don’t Know)

1. The *AEO* is **used extensively in my work.**

Enter number here:

(If your answer is 1 or 2, please tell us why.)

2. The *AEO* is **clearly written.**

Enter number here:

(If your answer is 1 or 2, please tell us why.)

3. The *AEO* is **relevant.**

Enter number here:

(If your answer is 1 or 2, please tell us why.)

4. Do you use **other sources** with information similar to the *AEO*? (*Please check.*)

Yes

No

If yes, please list one or more of those sources.

If you are familiar with the modeling details behind the *AEO*, then please continue with questions 5 thru 9. If not, please provide the name and e-mail address of someone in your organization who is knowledgeable about the *AEO* and go on to Section B on the *IEO*.

Name:

E-mail Address:

5. The *AEO* **incorporates the changing industry structure.**

Enter number here:

(If your answer is 1 or 2, please tell us why.)

6. **Appropriate assumptions** (e.g. GDP, world oil prices, environment) are used in the *AEO*.

Enter number here:

(If your answer is 1 or 2, please tell us why.)

7. **Methodology used in the *AEO*** - Are you familiar with the NEMS model structure?

If the answer is “Yes” continue,

If “No”, go to the next question.

Use a scale from 1 to 5, with 1 = Strongly Disagree, 5 = Strongly Agree; Answer using 6 if you Don't Know.

Strongly					Strongly
Disagree		Neutral		Agree	
1	2	3	4	5	6 (Don't Know)

The methodology is suitable to the analysis of the following:

(7a.) End-Use Sectors

- (i) Residential Sector
 - Enter number here:
- (ii) Commercial Sector
 - Enter number here:
- (iii) Industrial Sector
 - Enter number here
- (iv) Transportation
 - Enter number here
 - (If your answer to i – iv is 1 or 2, please tell us why.)

(7b.) Supply

- (i) Petroleum
 - Enter number here:
- (ii) Natural Gas
 - Enter number here:
- (iii) Coal
 - Enter number here:
- (iv) Renewables
 - Enter number here:
- (v) Electric Power Generation
 - Enter number here:
 - (If your answer to i – v is 1 or 2, please tell us why.)

(7c.) Petroleum Refining

- Enter number here:
 - (If your answer is 1 or 2, please tell us why.)

8. The **conclusions** reached in the report are **supported** by the analysis in the *AEO* and its companion report, "Assumptions to the AEO".

Enter number here:
(If your answer is 1 or 2, please tell us why.)

9 The information in the *AEO* is of **high quality**.

Enter number here:
(If your answer is 1 or 2, please tell us why.)

Is there anything else you would like to tell us about the *AEO*?

CONTINUE WITH *IEO* – IF FAMILIAR

B. *International Energy Outlook*

Because analyses by the Energy Information Administration (EIA) are required to be policy-neutral, the projections in this *International Energy Outlook 2004 (IEO2004)* are based on Federal and State laws and regulations in effect on September 1, 2003. The potential impacts of pending or proposed legislation, regulations, and standards—or of sections of legislation that have been enacted but that require funds or implementing regulations that have not been provided or specified—are not reflected in the projections.

Use a scale from 1 to 5, with 5 meaning that you strongly agree with the statement; 4 meaning you agree; 3 meaning you are neutral, 2 meaning you disagree; and 1 meaning you strongly disagree with the statement. If the answer is “Don’t Know”, please answer using a 6.

Strongly Disagree		Neutral		Strongly Agree		
1	2	3	4	5	6 (Don't Know)	

1. The *IEO* is **extensively used** in my work.

Enter number here:

(If your answer is 1 or 2, please tell us why.)

2. The *IEO* is **clearly written**.

Enter number here:

(If your answer is 1 or 2, please tell us why.)

3. The *IEO* is **relevant**.

Enter number here:

(If your answer is 1 or 2, please tell us why.)

4. Do you use **other sources** with information similar to the *IEO*? (Please check)

Yes

No

If yes, please list one or more of those sources.

If you are familiar with the modeling details behind the *IEO*, then please continue with questions 5 thru 8. If not, please provide the name and e-mail address of someone in your organization who is knowledgeable about the *IEO*.

Name:

E-mail Address:

Thank you for your participation in this study.

5. The *IEO* incorporates the changing industry structure.

Enter number here:

(If your answer is 1 or 2, please tell us why.)

6. **Appropriate assumptions** (e.g. GDP, world oil prices, environment) are used in the *IEO*.

Enter number here:

(If your answer is 1 or 2, please tell us why.)

7. The **conclusions** reached in the report are **supported** by the analysis in the *IEO*.

Enter number here:

(If your answer is 1 or 2, please tell us why.)

8. The information in the *IEO* is of **high quality**.

Enter number here:

(If your answer is 1 or 2, please tell us why.)

Is there anything else you would like to tell us about the *IEO*?

“Thanks for responding.”

Attachment 2: Survey Results

Table of Results: Abbreviated Questions and Descriptive Statistics

Abbreviated Questions	Average	% 1s&2s	%4s&5s
AEO Section:			
1. The AEO is used extensively in my work.	3.85	12.5%	68.8%
2. The AEO is clearly written.	4.08	1.8%	80.1%
3. The AEO is relevant.	4.32	2.8%	88.0%
4. Do you use other sources with information similar to the AEO?			
5. The AEO incorporates changing industry structure.	3.51	7.2%	49.2%
6. Appropriate assumptions (e.g., GDP, world oil prices, environment) are used in the AEO.	3.64	7.5%	59.7%
7.a. The methodology is suitable to the analysis of the following end-use sectors:			
i. Residential	3.70	12.1%	66.7%
ii. Commercial	3.79	6.1%	66.7%
iii. Industrial	3.46	11.4%	48.6%
iv. Transportation	3.41	17.2%	55.2%
7.b. Supply			
i. Petroleum	3.76	6.1%	66.7%
ii. Natural Gas	3.56	16.7%	52.8%
iii. Coal	3.88	0%	68.8%
iv. Renewables	3.45	20.7%	51.7%
v. Electric Power Generation	3.80	12.5%	72.5%
7.c. Petroleum Refining	3.37	14.8%	40.7%
8. The conclusions reached in the report are supported by the analysis in the AEO and its companion report, "Assumptions to the AEO."	3.95	5.0%	76.7%
9. The information in the AEO is of high quality.	4.13	2.9%	82.3%
Is there anything else you would like to tell us about the AEO?			
IEO Section:			
1. The IEO is used extensively in my work.	3.34	14.3%	42.9%
2. The IEO is clearly written.	3.94	2.8%	77.8%
3. The IEO is relevant.	4.11	0%	83.3%
4. Do you use other data sources with information similar to the IEO?			
5. The IEO incorporates the changing industry structure.	3.64	7.1%	64.2%

6. Appropriate assumptions (e.g., GDP, world oil prices, environment) are used in the IEO.	4.0	0%	85.7%
7. The conclusions reached in the report are supported by the analysis in the IEO.	4.0	0%	73.3%
8. The information in the AEO is of high quality.	4.13	0%	73.3%
Is there anything else you would like to tell us about the IEO?			

Scale instruction: Indicate your evaluation “Using a scale from 1 to 5, with 5 meaning that you strongly agree with the statement; 4 meaning you agree; 3 meaning you are neutral; 2 meaning you disagree; and 1 meaning you strongly disagree with the statement. If the answer is “Don’t know (DK)”, please answer DK.”