

1. **[[[SLIDE 1]]] Welcome (and where the restrooms are) – 40 sec**

- Good morning, ladies and gentlemen. Welcome to Room 100 of the Keck Center of the National Academy of Sciences, which is used for many august occasions (and even some August occasions).
- **[[[SLIDE 2]]]** For those in the room who may need to use comfort facilities during the day: Go out either of the doors in the back of this room and turn right. Turn right again just before you reach the glass doors to the building lobby. The restrooms are on your left down that hallway.
- **[[[SLIDE 3]]]** Welcome also to those who are watching by webcast in real time, and to those who may view the video archives of today's and tomorrow's discussions, which will be posted online. The video access URLs are shown on the screen.

2. **About BECS – 1 min 10 sec**

- **[[[SLIDE 4]]]** My name is Meredith Lane. I'm the director of the
- National Research Council's Board on Environmental Change and Society, known as BECS. **[[[SLIDE 5]]]** My board has
 - Interests and expertise in the intersection of societal and environmental systems, sometimes called the "human-environment interface" or "human dimensions of global change" or "socio-ecological interactions".
 - Particular interests and expertise of the board are in decision sciences, both analysis and decision support; economic policy and analysis, including valuation of natural resources; risk evaluation and management; and societal adaptation to change.
 - A short way of describing BECS interests is that we engage in promoting and developing "Science for managing transitions".

- Recent and current activities of the board include
 - [[[SLIDE 6]]] A consensus study on *Climate Change and Social Stress: Implications for Security Analysis*;
 - [[[SLIDE 7]]] A workshop titled “Sustainability Science: Can Earth’s and Society’s Systems Meet the Needs of 10 Billion People?” to be held 30 September through 1 October of this year, at the main NAS building; and
 - And the project of which today’s workshop is a part: “Risk Management and Governance Issues in Shale Gas Development”.

3. Intro to “big picture” – 2 min 30 sec

- [[[SLIDE 8]]] Estimates of the quantities of natural gas and oil that can be obtained through hydraulic fracturing of deep shale deposits have been cause for economic optimism in recent years.
 - For example, [[[SLIDE 9]]] the *America’s Energy Future* report would have painted a different picture had it been known that shale gas adds 27 to 30 % to the total of reserves.
 - The presence of abundant natural gas means the U.S. can rely less than otherwise on nuclear and coal electricity generation, and use the transition time it provides to increase energy efficiencies, renewable sources, and carbon capture and storage mechanisms.
 - The *Transitions to Alternative Vehicles and Fuels* report notes that increased domestic production means that “natural gas is now a viable option for providing transportation fuels through multiple pathways,” including hydrogen fuel cells.
- Indeed, the positive aspects of this technology were not lost on the

respondents to the elicitation [[[SLIDE 10]]] that forms a starting point for today’s workshop, about which you will hear more shortly. Respondents noted, among other positives:

- Potential for tax revenues and economic growth;
 - Jobs that are brought in to communities;
 - Prospects of energy independence and the benefits that would bring to the economy and national security; and
 - The potential for abundant natural gas to provide a means to transition away from more environmentally harmful fuels.
- [[[SLIDE 11]]] Other NRC projects related to hydraulic fracturing include
 - *Induced Seismicity Potential in Energy Technologies*, which concluded, among other things, that “the process of hydraulic fracturingdoes not pose a high risk of inducing felt seismic events”.
 - An ongoing project in DELS is titled *Development of Unconventional Hydrocarbon Resources in the Appalachian Basin*, and
 - the Institute of Medicine has a soon to be published workshop summary on *Health Impact Assessment of Shale Gas Extraction*.
 - [[[SLIDE 12]]] The primary sponsor of this BECS project specifically requested a consideration of risks related to shale gas development, because every silver lining has a potential cloud—that is, all new technologies bring both benefits and risks. Thus, today’s focus is on investigating ways and means of managing the risks so that society may better enjoy the benefits.

4. Sponsors – 40 sec

We are grateful to the sponsors of this project, who themselves represent a range of viewpoints:

- **National Science Foundation** – the agency of the U.S. government that

focuses on scientific inquiry balanced with broader interests, and specifically its Division of Social, Behavioral and Economic Sciences, represented here today by the program officer that supervises the award;

- The **Park Foundation**, which is interested in public communication of options surrounding this technology, and is making our webcast possible; and
- **Shell Upstream America**, which has supported travel to this workshop by a range of experts.

ROUND OF APPLAUSE

5. [[[SLIDE 13]]] With that as background, I now introduce Paul Stern, director of this BECS project, who will introduce the committee and its charge.