Founding Members

- Chevron
- Clean Air Task Force
- CONSOL Energy
- Environmental Defense Fund
- EQT Corporation
- Group Against Smog and Pollution (GASP)
- Heinz Endowments
- Citizens for Pennsylvania’s Future (PennFuture)
- Pennsylvania Environmental Council
- Shell
- William Penn Foundation
Board of Directors

- **Armond Cohen**, Executive Director, Clean Air Task Force
- **Jared Cohon**, President of Carnegie Mellon University
- **Nicholas Deluliis**, President of CONSOL Energy
- **Paul Goodfellow**, Vice President, U.S. Unconventionals, Shell
- **Paul King**, President, Pennsylvania Environmental Council
- **Fred Krupp**, President, Environmental Defense Fund
- **Jane Long**, Principal Associate Director/Fellow, Lawrence Livermore National Laboratory (retired)
- **Bruce Niemeyer**, President, Chevron Appalachia
- **Paul O’Neill**, former Secretary of the U.S. Treasury Department and former CEO of Alcoa
- **David Porges**, President and CEO of EQT Corporation
- **Robert Vagt**, President, The Heinz Endowments
- **Christine Todd Whitman**, former Administrator of the U.S. Environmental Protection Agency and former Governor of New Jersey
FORMATIONAL PRINCIPLES
IEA: Golden Rules for a Golden Age of Gas

- Measure, disclose and engage
- Watch where you drill
- Isolate wells and prevent leaks
- Treat water responsibly
- Eliminate venting, minimize flaring and other emissions
- Be ready to think big
- Ensure a consistently high level of environmental performance

Source: Golden Rules for a Golden Age of Gas (IEA, 2012)
U.S. Secretary of Energy’s Advisory Board, Shale Gas Production Subcommittee

• …for industry to increase their best practices process for field engineering and environmental control activities by adopting the objective of continuous improvement, validated by measurement and disclosure of key operating metrics

• Best practices involves the entire range of shale gas operations

• …understand the importance of involving non-industry stakeholders

Source: SEAB Shale Gas Production Subcommittee – Final Report (November 2011)
• **Working group (2011)**
  • Defined scope
  • Conceptually aligned
  • Constrained group size

• **Operationalizing best practice**
  • Existing universe of practices
  • Adaptive standards
  • Basin specific

• **Model process**
  • Balance
  • Collaboration
  • Verifiability
STANDARDS OVERVIEW
Groundwater Protection Standards

- **Zero discharge** of wastewater until CSSD adopts a standard for treating wastewater.
- Wastewater **recycling** – > 90%.
- **Closed loop containment** of drilling fluids, eliminating the use of pits.
- Use of **double-lined impoundments** equipped with leak detection.
- Establishment of a predrill **Area of Review**, including subsurface geology and corresponding **risk analysis**.
- **Groundwater monitoring** – pre and post operations.
- Casing and cement standards that ensure complete isolation from groundwater.
- **Public disclosure** of well stimulation fluids.
- **Well pad design** that minimizes risk of contamination to water sources.
- **Spill response and public notification plans**.
Regional Air and GHG Standards

- Removal of free hydrocarbons from flowback and produced water before storage.
- “Green Completions” – Capture of pipeline-quality gas, with certain exceptions.
  - Gas not captured must be flared; not vented.
- Flaring requirements – 98% destruction efficiency and a prohibition on pit flaring.
- Emissions standards for:
  - diesel drilling rig engines and fracturing pump engines
  - compressor engines
  - on-road truck engines
- Control of VOC emissions from storage vessels (> 95% reduction).
- Standards for reciprocating compressors and pneumatic controllers.
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