

## **Natural gas leakage: Moving the science forward**

Workshop sponsored by the Natural Gas Initiative, Stanford University

**Date** Wednesday November 9<sup>th</sup> and Thursday November 10<sup>th</sup>, 2016

**Place** Stanford University, Palo Alto CA

### **Structure**

- Participants: scientific community, science funders, industry technical managers
- Invitation only (<50 participants)
- Structure: Four topical sessions with time for discussion and workgroups
- Short presentations from research leaders: all presentations focused on “key research gaps”
- Facilitated discussion on additional gaps, areas of uncertainty, needed progress
- Breakout to workgroups to draft outline material
- Chatham House rules: free and open discussion, no specific attribution
- Session leads will generate working paper. Tentative title: “Natural gas leakage: Moving the science forward”

### **Agenda**

#### November 9<sup>th</sup> 2016

8:30–9:30 – Introduction and stage setting

9:30–12:30 – Session 1: Improving bottom-up and facility-scale studies

12:30–1:30 – Lunch

1:30–5:00 – Session 2: Improving top-down studies and remote sensing

5:00–6:30 – Reception

#### November 10<sup>th</sup>, 2016

8:30–12:00 – Session 3: Moving towards a global science

12:00–1:00 – Lunch

1:00–4:30 – Session 4: At the interface of science and regulation

4:30–5:30 – Synthesizing discussion

### **Session leaders**

Bottom-up: Adam Brandt, Stanford University

Top-down: Gabrielle Petron, NOAA/CU

Global science: Rob Jackson, Stanford University

Science and regulation: Garvin Heath, NREL/JISEA

## Program

### Day 1: Wednesday, Nov 9<sup>th</sup> 2016

#### **1. Introduction and kickoff (8:30-9:30)**

- a. Purpose of workshop: Adam Brandt (Stanford)
- b. Overall views: high-level perspectives on largest challenges
  - i. Federal perspective on state of the science and priorities: Colin Cunliff (DOE)
  - ii. Corporate perspective on state of the science: Heide Mairs (ExxonMobil)
- c. Breakfast provided

#### **2. Improving bottom-up estimates from device- or facility-scale studies (9:30-12:30)**

- a. Discussion leader: Adam Brandt (Stanford University)
- b. Detailed plan:
  - i. 9:30–10:40 – Presentations: “10 largest research gaps”
    1. Dan Zimmerle (Colorado State University)
    2. Allen Robinson (Carnegie Mellon University)
    3. Fiji George (Southwestern/OneFuture)
    4. Adam Brandt (Stanford University)
  - ii. 10:40–11:20 – Plenary discussion and Q&A
  - iii. 11:20–11:35 – Break
  - iv. 11:35–12:15 – Break-out groups (draft text around focus areas)
  - v. 12:15–12:30 – Regroup and summarize from break-out groups
- c. Desired outcomes:
  - i. Notes on gaps, needed studies, and key priorities
  - ii. Notes on working groups or follow-on actions

#### **3. Lunch (12:30-1:30)**

#### **4. Improving large-scale, remote, and top-down studies (1:30-5:00)**

- a. Discussion leader: Gabrielle Petron (NOAA/CU Boulder)
- b. Detailed plan:
  - i. 1:30–2:50 – Presentations: “10 largest research gaps”
    1. Gabrielle Petron (NOAA/CU Boulder)
    2. Stefan Schwietzke (NOAA)
    3. Thomas Lauvaux (Penn State)
    4. Marc Fischer (Lawrence Berkeley National Laboratory)
  - ii. 2:50–3:20 – Plenary discussion and Q&A
  - iii. 3:20–3:35 – Break
  - iv. 3:35–4:30 – Break-out groups (draft text around focus areas)
  - v. 4:30–5:00 – Regroup and summarize from break-out groups
- c. Desired outcomes:
  - i. Notes on gaps, needed studies, and key priorities
  - ii. Notes on working groups or follow-on actions

**5. Reception at Stanford Faculty Club: 5:00-6:30****Day 2: Thursday, Nov 10<sup>th</sup> 2016****6. Towards a global science on natural gas leakage (8:30-12:00, breakfast provided)**

- a. Discussion leader: Rob Jackson (Stanford)
- b. Detailed plan:
  - i. 8:30–9:50 – Presentations: “10 largest research gaps”
    1. Rob Jackson (Stanford University)
    2. David Picard (Clearstone Engineering)
    3. Felix Vogel (LCSE)
  - ii. 9:50–10:20 – Plenary discussion and Q&A
  - iii. 10:20–10:35 – Break
  - iv. 10:35–11:30 – Break-out groups (draft text around focus areas)
  - v. 11:30–12:00 – Regroup and summarize from break-out groups
- c. Desired outcomes:
  - i. Notes on gaps, needed studies, and key priorities
  - ii. Notes on working groups or follow-on actions

**7. Lunch: 12:00-1:00****8. Making science and regulation work together (1:00-4:30)**

- a. Discussion leader: Garvin Heath (NREL/JISEA)
- b. Detailed plan:
  - i. 1:00–2:20 – Presentations: “10 largest research gaps”
    1. Garvin Heath (NREL/JISEA)
    2. Austin Brown (OSTP)
    3. Melissa Weitz (EPA)
    4. David Lyon (EDF)
  - ii. 2:20–2:50 – Plenary discussion and Q&A
  - iii. 2:50–3:05 – Break
  - iv. 3:05–4:00 – Break-out groups (draft text around focus areas)
  - v. 4:00–4:30 – Regroup and summarize from break-out groups
- c. Desired outcomes:
  - i. Notes on gaps, needed studies, and key priorities
  - ii. Notes on working groups or follow-on actions

**5. Overall synthesis and cross-cutting ideas: 4:30-5:30**