West Virginia 2009 Energy Summit
Roanoke, WV
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AEP CCS Project Update

Mountaineer Plant - New Haven, WV

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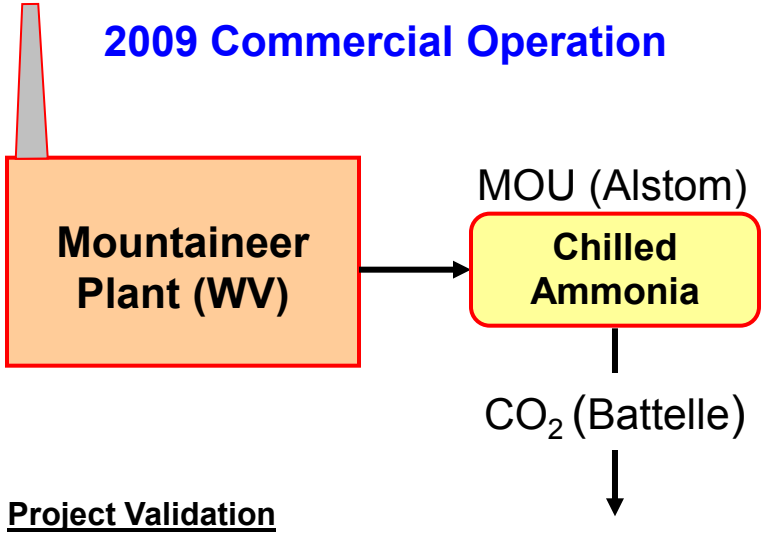
A Brief Look at History:

Our view of the future, way back in March of 2007

Phase 1

2009 Commercial Operation



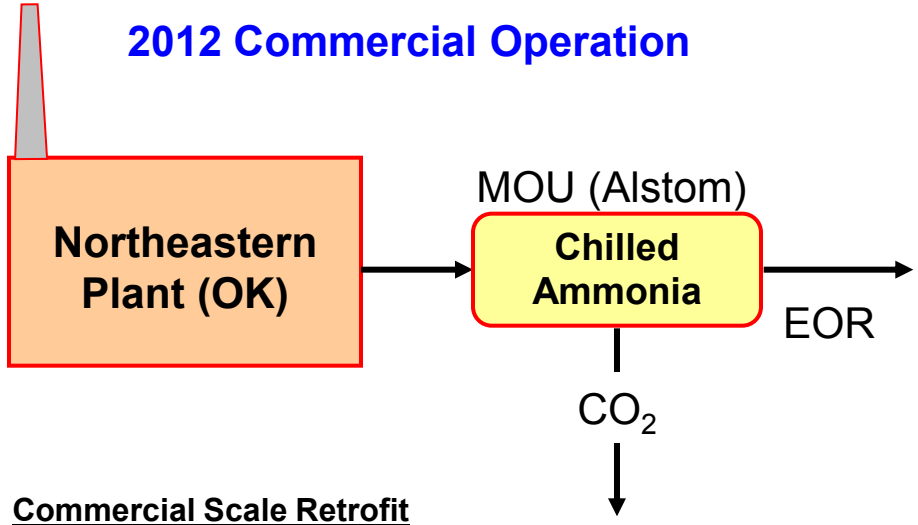
Project Validation

- 20 MW_e scale
  - (Scale-up of Alstom/EPRI 1.7 MW field pilot at WE Energies)
- ~100,000 tons CO_2 per year
- In operation 3Q 2009
- Approximate total cost $80 – $100M
- Using Alstom "Chilled Ammonia" Technology
- Located at the AEP Mountaineer Plant in WV
- CO_2 for geologic storage

Phase 1 will capture and sequester 100,000 metric tons of CO2/year

Phase 2

2012 Commercial Operation



Commercial Scale Retrofit

- ~ 200 MW_e scale
- ~1.5MM tons CO_2 per year
- In operation 2012
- Approx. capital $250 – $300M ($CO_2$ capture & compression)
- Approx. O&M cost $12M per year
- Energy penalty ~ 35 – 50 MW steam, 25 – 30 MW for CO_2 compression
- Retrofit NOx Controls and Wet FGD Required: ~$225 – $300M (required for CO_2 capture equipment)
- Located at AEP's Northeastern Plant Unit 3 or 4 in Oklahoma
- CO_2 for Enhanced Oil Recovery (EOR) or geologic storage

Phase 2 will capture and sequester 1.5 Million metric tons CO2/year

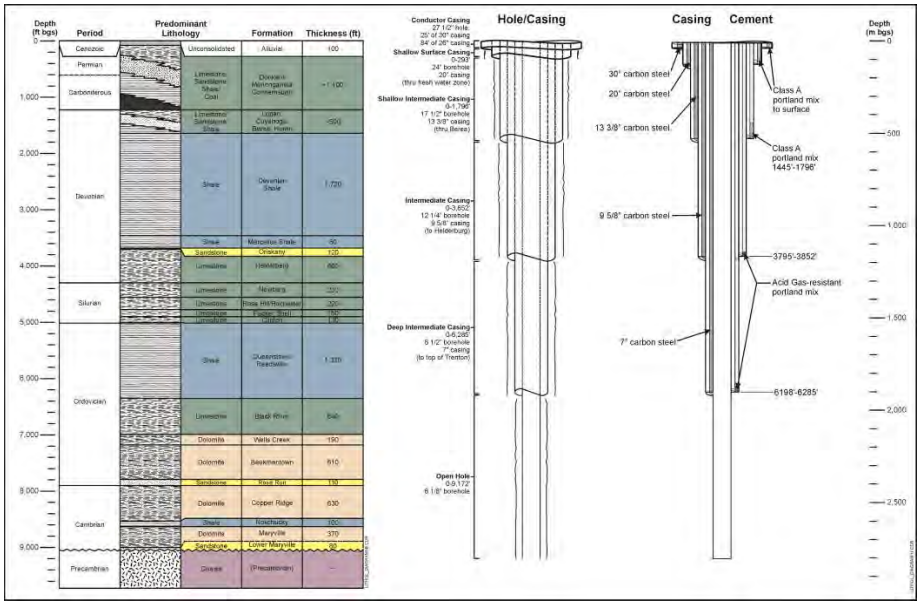
Site Characterization and Feasibility Study

The foundational work for AEP's CCS program

Seismic Survey
Summer 2003

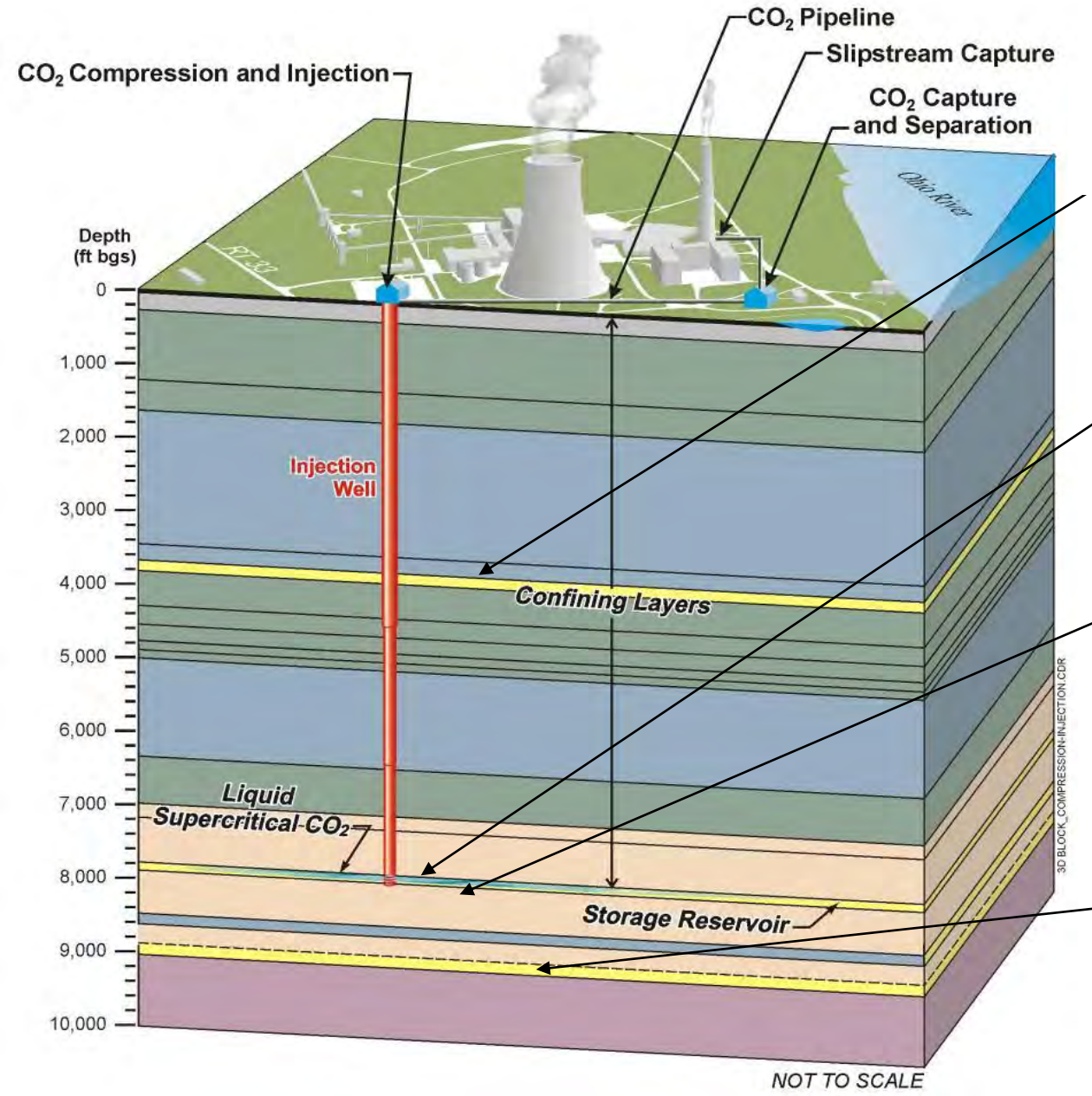
Drilling and Testing
AEP#1 Well – 2003-05

Site characterization and feasibility assessment conducted by Battelle under previous funding by DOE and others.



CO_2 Injectivity In the Mountaineer Area

Battelle
The Business of Innovation



CO_2 injection should also be possible in shallower sandstone and carbonate layers in the region

Rose Run Sandstone (~7800 feet) is a regional candidate zone in Appalachian Basin

A high permeability zone called the “B zone” within Copper Ridge Dolomite has been identified as a new injection zone in the region

Mount Simon Sandstone/Basal Sand - the most prominent reservoir in most of the Midwest but not desirable beneath Mountaineer site

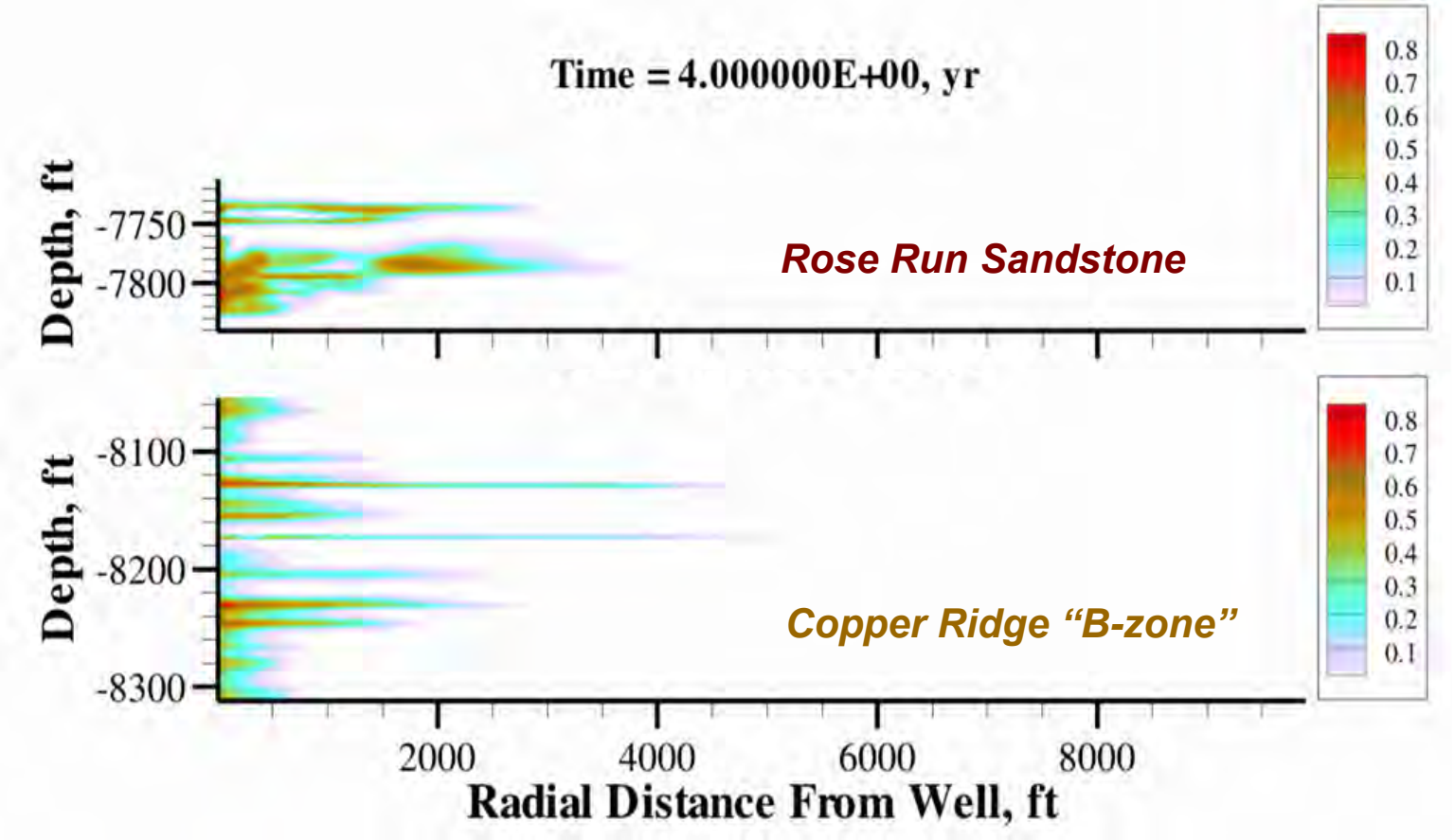
Where We Are Today:
Chilled Ammonia CCS Validation Facility

- **Location: AEP Mountaineer Plant**
  - **1,300 MWe Supercritical PC Unit**
  - **High Sulfur Eastern Bituminous Coal**
  - **SCR, ESP, Wet FGD, SO_3 mitigation**
- **20 MWe scale**
  - **Approximately 1.5% of power plant flue gas**
  - **(Scale-up of Alstom/EPRI 1.7 MW field pilot at WE Energies)**
- **Approximate total cost >$100M**
  - **Funding provided by AEP, Alstom, RWE, & EPRI**
- **Using Alstom "Chilled Ammonia" CO_2 capture technology**
  - **>85% CO_2 capture rate**
- **~100,000 tons CO_2 per year stored in deep-saline formations approximately 1.5 miles below the plant surface**
- **First CO_2 captured - September 1, 2009**
- **First CO_2 injected underground - October 2, 2009**
- **Project expected to operate for 1 to 5 years**

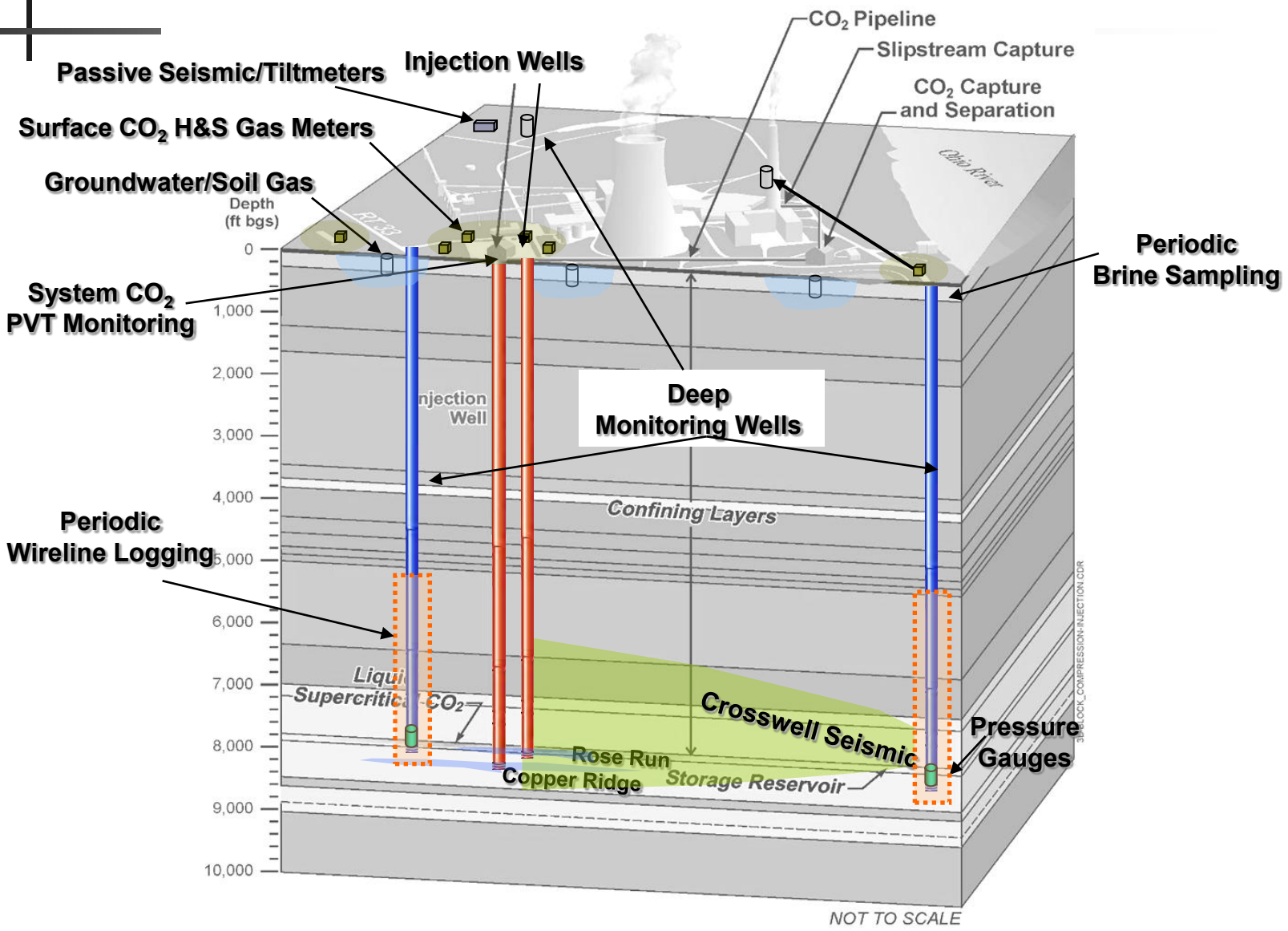
UIC Permitting – Area of Review

Battelle Simulations of 165,000 tons CO_2 per year

STOMPCO_2 Simulations Showing CO_2 Saturation



Monitoring System Design



Alstom's Chilled Ammonia Process Installation Progress at AEP Mountaineer Plant

(20 MWe Equivalent or Approximately 1.5% of Unit Flue Gas)

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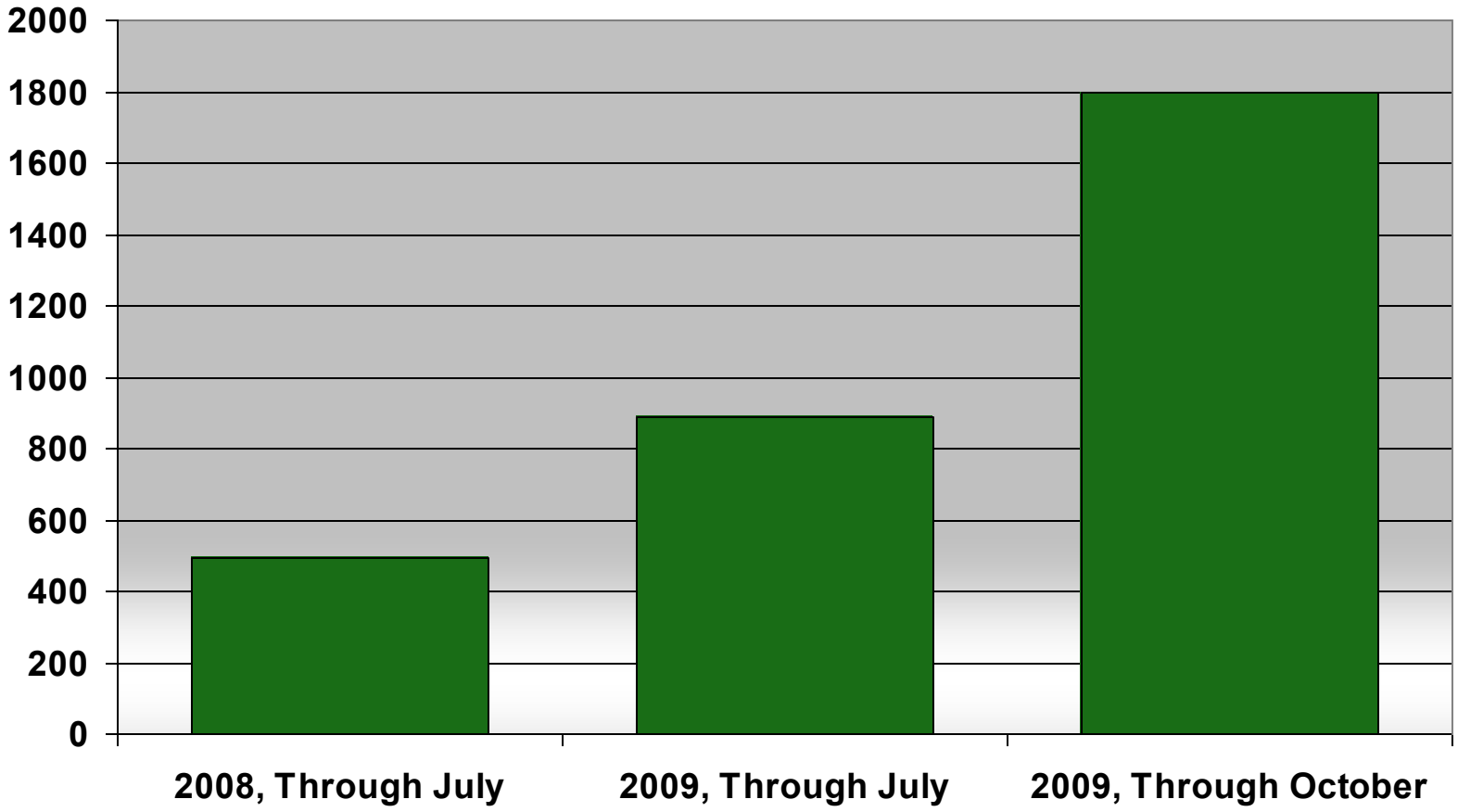
Media Relations Activity Increasing Rapidly

International, National, Local Regional,
Trade Publications, Financial Wires, and National Broadcasts

Total Climate-Related Calls Handled by AEP Media Relations



To date we have had approximately 35 media tours of the facility from reporters with media outlets around the world. In addition, we had approximately 40 reporters at the October 29 dedication.

Next Steps for AEP CCS Program

- **AEP received notification from DOE of $334M grant through CCPI III**
  - **Announced on Friday, December 4**
  - **Scale up of the CO_2 capture systems to commercial-scale.**
    - 235-MW slipstream at Mountaineer Plant
    - ~1.5 million tonnes CO_2 per year into saline formations
    - Estimated project cost: $668M
    - Alstom's Chilled Ammonia Process
    - Schlumberger & Battelle to lead sequestration efforts
    - Geologic Experts Advisory Group
      - Battelle, Schlumberger, CONSOL, OSU, WVU, MIT, UT, LLNL, WV Geological Survey, OH Geological Survey, & WV DOE
  - **System to startup in mid-year, 2015**
- **Continuing to evaluate other CO_2 capture technologies through US Carbon Research Center**
- **Ongoing assessments of geologic capacity throughout AEP fleet**
  - **Regional partnership efforts**
  - **Privately-contracted geology studies**

AEP AMERICAN ELECTRIC POWER

Thank You