Big Gas, Big Data and Methane

Building a Monitoring, Verification and Performance Management System to Meet Climate Change Goals

California Methane Symposium
Sacramento, CA
June 7, 2016
“Predicting rain doesn’t count; Building arks does.”

Warren Buffett
Berkshire Hathaway’s ‘All-of-the-Above’ Energy Portfolio

Berkshire Hathaway Energy is one of the nation’s top renewable energy producers, but its utilities generate more than 70 percent of their power from fossil fuels. Here’s a breakdown of their mix:

**GENERATION MIX FOR BERKSHIRE HATHAWAY ENERGY**
*Total net owned capacity (by megawatts)*

- **Hydroelectric**: 1,275 MW (4%)
- **Solar**: 1,293 MW (4%)
- **Wind**: 5,124 MW (18%)
- **Nuclear**: 456 MW (2%)
- **Geothermal**: 370 MW (1%)
- **Coal**: 9,798 MW (34%)
- **Natural gas**: 10,534 MW (37%)

**Total net owned capacity: 28,850 MW**

**SOURCE:** Berkshire Hathaway annual report to U.S. Securities and Exchange Commission
Program

SUMMIT THEME
Leveraging Innovative Technology to Improve Production and Lower Costs

ROUNDTABLE THEMES

1. IT & Security Optimization
   - Security, threat and vulnerability risk assessment
   - Understanding the demands of tomorrow’s digital-fuelled business
   - Leverage the power of mobile technology in the workforce
   - Network security
   - Data center infrastructure of the future
   - Managing the enterprise’s

2. Mobility
   - Leverage the power of mobile technology in the workforce
   - VSAT/Broadband and Wireless Communication Efficiency
   - Understanding business engagement and the value of IT
   - Embracing BYOD policy
   - Planning, management and implementation of ICT solutions
   - Communications in the Digital

3. Big Data Analytics
   - The importance of managing the customer’s experience
   - Large scale analytics and platforms
   - VSAT/Broadband and Wireless Communication Efficiency
   - Uncover hidden patterns in analytics to provide competitive advantages
   - Initiatives using predictive analytics and data mining
THE USC-CHEVRON CENTER FOR SMART OILFIELD TECHNOLOGIES (CISOFT) CELEBRATES ITS FIRST DECADE

USC representatives celebrated ten years of successful partnership between Chevron and Viterbi School of Engineering.

BY: ANGUS MCCOLL
May 24, 2013

Viterbi School faculty and staff recently joined Chevron executives at the Hyatt Huntington Beach Hotel in Huntington Beach, California, on April 25, 2013 to celebrate ten years of the highly successful research partnership between USC and Chevron in the USC – Chevron Center for Interactive Smart Oilfield Technologies (CISOft).

The event featured a review of the on-going research projects, highlighting both the fundamental academic accomplishments and their field applications. It also showcased CISOft’s history, anticipated future opportunities, and celebrated the vision and leadership that have made this unique partnership so successful.

“We succeeded because of a compelling shared vision of ‘Digital Energy. The partnership brought together the right people at the right time to capture the emerging intersection of IT and energy,’ said Dr. Donald Paul, former Chevron VP and CTO and now the Executive Director of the USC Energy Institute and William M. Keck Chair of Energy Resources. Paul recapped the history of CISOft and articulated a vision for continued collaboration.

“Honored by the Society of Petroleum Engineers as a pioneer in the field of ‘digital energy,’ Paul was the key person that envisioned the concept of ‘i-field.’ Chevron’s unique label for its digital oilfield efforts, in 2001. This is a concept of a ‘smart’ oilfield, instrumented with wireless sensors connected and integrated by information technology to effectively analyze and exploit the avalanche of ‘big data’ for better defining, managing and optimizing work processes. The i-field creates a new process framework to continuously improve oilfield safety, efficiency and performance at a relatively modest cost in terms of research and applied technology.

Paul noted that by the mid-1990s most companies were restructuring their proprietary research organizations and were creating strategies to expand programs in leading research universities that would analyze and solve fundamental engineering problems. He noted, however, that there were limitations to traditional industry-university research structures in that “there was simply not enough scale, not enough function... and not enough drive from the business side to accomplish something new.”
Exploration & Production

- Operational Performance
- Economic Performance

Wellhead to Burner Tip

- Compliance Reporting
- Sustainability Reporting