Devon’s Natural Gas STAR Experience

Outline

Devon Energy Corporation

Devon’s Natural Gas STAR Experience
  • Getting started
  • Keeping up the momentum
  • Specific reductions
  • Fort Worth Basin success story
  • San Juan Basin success story
Devon Energy Corporation

Devon’s Worldwide Operations

- **Canada**: 6%
- **U.S. Onshore**: 12%
- **Gulf of Mexico**: 58%
- **Brazil**: 24%
- **China**: 66% Gas, 34% Oil

94% North America

$29 Billion Market Cap

www.devonenergy.com
Devon’s Western Division

Natural Gas STAR Participating Field Offices
(Western Division)

- Riverton, WY
- Worland, WY
- Baggs, WY
- Farmington, NM
- Artesia, NM
- Midland, TX

Exploration and Production in the San Juan Basin
Devon’s San Juan Presence

- Proved reserves: \( \approx 370 \text{ BCF (gross)} \)
- Daily Production: \( \approx 125 \text{ MMCF} \)
- Net acreage: \( \approx 52 \text{ sections} \)
- Number of counties with Devon leases: 2 (San Juan & Rio Arriba)
- Drilling activity: 24 wells in 2008 and 0 wells in 2009
- # of Employees: 37

Devon’s Natural Gas STAR Experience
EPA Welcomes Devon as a Partner

Devon Energy becomes an official partner in the EPA Natural Gas STAR Program on July 21, 2003

Focus

Primary focus for a successful program:

- Encouragement and support from upper management
- Select the right implementation manager
- Roll the program out to operations
- Educate the field on the goals of the program
- Recognize successes
- Research historical reductions
- Locate documentation for reductions
- Develop a tracking system
Program Participation - 2004

- Devon actively participated in a video shoot in the Bridgeport area showing Devon’s involvement in the STAR Program (produced by a public TV station)
- 6-minute version for airing during environmentally related segments
- 12-minute version to be used by the STAR Program to promote the Program to other companies
- Participated in an interview for the “STAR Profile” section of the Program’s fall edition of the STAR quarterly newsletter.
Program Participation - 2004

- Developed a monthly STAR newsletter to be distributed to managers to assure communications regarding the status of the Program.
- Newsletter contains:
  - A STAR (Partner Reduction Opportunity (PRO) Fact Sheet
  - Link to lessons learned on the EPA STAR website
  - Graph reflecting Devon’s emission reductions annually
  - Status table providing a breakdown by Division, Area, Activity

Program Participation - 2004

- Co-authored a SPE paper on the optimization of separator pressure to reduce methane emissions.
- Paper was presented at the annual SPE conference held in Galveston, Texas.
- Authored with the intent of creating a PRO Fact Sheet for the STAR Program
Program Participation - 2005

- Sponsored and co-sponsored EPA Natural Gas STAR Technology Workshops Oklahoma City and Casper
- Participated in a leak detection survey at the Bridgeport Plant (USEPA Natural Gas STAR DI&M Grant)
- Highlighted the STAR program as a pollution prevention initiative at an Environmental Federation of Oklahoma Pollution Prevention Workshop
- Developed a database to track future methane reduction activities
- Database to be given to EPA for other Partners use upon completion

Awards

- 2004 Natural Gas STAR Rookie of the Year
- 2005 Natural Gas STAR Production Partner of the Year
- 2005 Natural Gas STAR Implementation Manager of the Year (Steve O’Connell of Devon)
- 2008 Natural Gas STAR Continuing Excellence Award
STAR Program (Best Management Practices (BMP’s))

BMP 1: Replace High-Bleed Pneumatic Controls
~4.78 Bcf of methane emission reductions through 2009

STAR Program BMP’s

BMP 2: Install Flash Tank Separators on Glycol Dehydrators
~101.07 Mmcf of methane emission reductions through 2009
STAR Program BMP’s

BMP 3: Partner Reported Opportunities (PRO’s)

- Reduced Emission Completions (REC’s) - 35.47 Bcf
- Absolute Open Flow (AOF) Testing - 1,025.13 Mmcf

Summary of Devon’s Emission Reductions

- Overall Reductions - 50.76 Bcf (through 2009)
  - Low Bleed Pneumatics 4.78 Bcf (-9%)
  - Reduced Emission Completions 35.47 Bcf (-70%)
  - AOF Testing 1,025.13 Mmcf (-2%)
  - VRU’s 3.19 Bcf (-6%)
  - Dehy Controls 95.49 Mmcf
  - Plunger Lift Systems 3.41 Bcf (-7%)
  - Flared Volumes 1.33 Bcf (-3%)
  - Other 1.46 Bcf (-3%)

- Overall savings of approximately $152,280,000 since 1990 (assuming an average of $3/mcf gas price)
Fort Worth Basin Success Story

- Implementation Manager discussed STAR opportunities with the Production Supervisor in the FWB
- Reviewed opportunities to reduce venting during cleanup procedures after fracs
  - Evaluated portable flare systems
  - Supervisor discussed it further with superintendents and foreman
- Completions Superintendent decided there was a better option available

FWB Reduced Emission Completions (RECs)

- Previous procedure upon completion of the frac job
- Flow well back to frac tanks until clean up is completed
- Snub tubing in the hole while venting gas back to reduce the pressure on the well
- Run required tests to atmosphere to calculate the absolute open flow potential
FWB RECs

- Current procedure upon completion of the frac job
- Install temporary flowline and meter run on location during completion process
- Flow well back to frac tanks until gas is encountered

- Turn well down line and sell gas while cleaning up the well
- Snub tubing in the hole while selling gas back to reduce the pressure on the well
- Run required tests through sales to calculate the absolute open flow potential
Benefits of FWB RECs

• Reduces the volume of methane emissions
• Allows wells to be cleaned up longer with better results
• Additional gas sales (net revenue of ~$50,000 per well)
• Safer work environment

Sand Buster- Green Completion Method

Created by Robert Jordan, Production Foreman

- Envisioned a cost effective way to capture loss revenue and reduce what is emitted into the atmosphere
- A system that protects the employee from potential injury
San Juan Best Practice

Before Sand Buster

Sand Buster

Results

NEBU 238 PC
Sand Buster Production

Flowing Through Sand Buster

$186,000 Increased Revenue

First Delivered Through Production Equipment
Results

Sand Buster Production

Flowing Through Sand Buster
$132,000 Increased Revenue
First Delivered Through Production Equipment

Sand Buster- Benefits

Reduced the amount of gas being sent to the atmosphere...

which leads to:

Less emissions into the atmosphere

Sand Buster has been constructed in other companies and have seen similar results
Success Breeds Success

- Measuring and reporting results in competition
  - Everyone benefits!
- Due to the success of the FWB RECs, other areas also use the technology
  - Washakie Basin of Wyoming and the San Juan Basin in New Mexico

Thank You.