Oil and Gas Production
Energy Efficiency Opportunities and Utility Programs
April 29, 2020

Speakers:
Neil Kolwey, SWEEP
Adam Selvin, CLEAResult
Mat Charney, CLEAResult
Energy Efficiency, Electrification, & Policy Assessment for Colorado’s Oil and Gas Industry

The Colorado Energy Office contracted with SWEEP to determine:

- What are the opportunities for energy efficiency and electrification in this industry?
- What are utilities doing to promote energy efficiency and electrification?
- What state and local policies are requiring/encouraging more electrification technologies?
Overview of Presentations

• Neil – Summary of Colorado utility survey responses re: electrification and energy efficiency
• Adam – Utility EE programs to serve oil and gas industry
• Mat – Example of successful utility program, EE projects implemented and benefits
### Colorado Oil and Gas Production

<table>
<thead>
<tr>
<th>County</th>
<th>Total natural gas production in 2018 (mcf)</th>
<th>Total oil production in 2018 (bbl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WELD</td>
<td>799,447,344</td>
<td>154,969,228</td>
</tr>
<tr>
<td>ADAMS</td>
<td>7,567,328</td>
<td>3,478,827</td>
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<tr>
<td>ARAPAHOE</td>
<td>4,762,348</td>
<td>2,320,015</td>
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<td>GARFIELD</td>
<td>495,033,611</td>
<td>1,459,041</td>
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<td>RIO BLANCO</td>
<td>51,267,348</td>
<td>3,770,077</td>
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<tr>
<td>MESA</td>
<td>61,683,821</td>
<td>164,889</td>
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<td>LA PLATA</td>
<td>295,078,977</td>
<td>16,266</td>
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<tr>
<td>LAS ANIMAS</td>
<td>57,307,735</td>
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Colorado Utility Survey

<table>
<thead>
<tr>
<th>County</th>
<th>Electric Utilities</th>
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<tbody>
<tr>
<td>WELD</td>
<td>United Power, Xcel Energy, Morgan County REA, Poudre Valley REA</td>
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<tr>
<td>ADAMS</td>
<td>Xcel, United Power, Morgan County</td>
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<tr>
<td>ARAPAHOE</td>
<td>Xcel</td>
</tr>
<tr>
<td>GARFIELD</td>
<td>Xcel, Grand Valley Power</td>
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<tr>
<td>RIO BLANCO</td>
<td>White River Power</td>
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<tr>
<td>MESA</td>
<td>Grand Valley Power</td>
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<tr>
<td>LA PLATA</td>
<td>La Plata Electric</td>
</tr>
<tr>
<td>LAS ANIMAS</td>
<td>San Isabel Electric</td>
</tr>
</tbody>
</table>

Survey Questions

- Are most oil and gas production sites in your area grid-connected?
- Do you offer EE incentives/programs?
- Do you offer any incentives for electric compressors?
Grid-Connected?

- All 8 CO utilities surveyed said most of their oil and gas production sites were grid-connected;

- CDPHE survey (2019) of 5500 production sites in Colorado: only ~20% of sites connected to electricity grid
EE Programs and Incentives

• **Tri-State incentives:**
  - Up to $6800 for VSDs on fans and pumps (prescriptive)

• **Xcel Energy programs/incentives:**
  - Prescriptive for VSDs on fans and pumps < 200 hp; Custom incentives for > 200 hp
Electric Compressor Incentives?
Energy Efficiency and Electrification Best Practices for Oil and Gas Production

Neil Kolwey, nkolwey@swenergy.org
Energy Efficiency Programing in Oil & Gas

Adam Selvin- Market Approach Director Commercial and Industrial
Energy Efficiency Programming in Oil & Gas

- Designed to help decrease annual energy consumption by providing an incentive to invest in energy efficiency measures

  - Environmental benefits
    - Reduced greenhouse gas emissions
  - Economic benefits
    - Reduced operating costs make businesses more profitable
  - Utility benefits
    - Reduce or maintain the overall system electric demand reduces the need to invest in additional generation and transmission assets
Energy Efficiency Programing in Oil & Gas

- Consultative programing
  - Oil fields are expensive water processing systems
    - 95-99% water cut rates
  - Field operators don’t speak energy
    - Many operators are held to energy cost metrics and need help controlling and reducing costs
  - Oil Fields are frequently changing and evolving leaving behind the opportunity to improve performance
    - System centralization, overall pumping efficiency
  - Trust is a critical project milestone
Energy Efficiency Programming in Oil & Gas

- Savings platforms
  - Prescriptive: Fast and simple measure rebates
  - Custom: Calculated incentives based on annual energy savings
  - Retro-commissioning: Incentives for improving a system's overall operating efficiency
  - Strategic Energy Management: Operationalize energy management
Xcel Energy – NM Oil & Gas Campaign
Mat Charney – Program Manager
Xcel Energy Oil & Gas Campaign Engagement Strategy

- At the beginning of 2017 CLEAResult began a focused energy efficiency outreach program to Xcel Energy New Mexico customers.
  - Utilizing existing experience and expertise, specific Oil & Gas measures and opportunities were identified.
  - **Variable speed drives**
    - Over 200hp – Custom Analysis
    - Under 200hp - Prescriptive
  - **Pump off controllers**
  - **High efficiency pumping system well conversions**
  - **Process optimization**
  - **Pipeline upsizing and optimization**
  - **Water shut-off**
  - **Optimizing motors, pumps and compressors**
  - **Pump replacements**
Xcel Energy Oil & Gas Campaign Engagement Strategy

• Drive Incentives: ~90% of program
  • Custom:
    • Over 200hp requires custom analysis and pre-approval: $400/kW
  • Prescriptive:
    • Under 200hp requires final invoices and field verification:

<table>
<thead>
<tr>
<th>Motor hp</th>
<th>Prescriptive rebate levels</th>
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<tbody>
<tr>
<td>1</td>
<td>$400</td>
</tr>
<tr>
<td>1.5</td>
<td>$500</td>
</tr>
<tr>
<td>2</td>
<td>$600</td>
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<tr>
<td>3</td>
<td>$700</td>
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<tr>
<td>5</td>
<td>$800</td>
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<td>7.5</td>
<td>$1,100</td>
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<tr>
<td>10</td>
<td>$1,300</td>
</tr>
<tr>
<td>15</td>
<td>$1,800</td>
</tr>
<tr>
<td>20</td>
<td>$2,300</td>
</tr>
<tr>
<td>25</td>
<td>$2,700</td>
</tr>
<tr>
<td>30</td>
<td>$3,200</td>
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<tr>
<td>40</td>
<td>$4,000</td>
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<tr>
<td>50</td>
<td>$4,900</td>
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<tr>
<td>60</td>
<td>$5,500</td>
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<td>75</td>
<td>$6,600</td>
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<td>100</td>
<td>$7,700</td>
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<tr>
<td>125</td>
<td>$8,900</td>
</tr>
<tr>
<td>150</td>
<td>$9,500</td>
</tr>
<tr>
<td>200</td>
<td>$10,500</td>
</tr>
</tbody>
</table>

Larger than 200 Requires custom evaluation and preapproval
Xcel Energy Oil & Gas Campaign Engagement Strategy

• CLEAResult Engineers and Program Consultants worked closely with XCEL Energy Key Account Managers (KAM) to develop program strategies.
  • Developed program buy-in through education of potential energy efficiency projects and understanding of unique customer non-energy efficiency concerns.
  • Developed a ‘Top 30’ customer list.
    • Coordinated with each KAM and utilized existing CLEAResult customer contacts to identify decision makers and energy efficiency champions at targeted customers.
    • Set up meetings to understand unique business models, operating strategies, review programs and identify opportunities.
    • Coordinated field visits and data collection.
    • Prepared custom project analysis and developed 5-year Energy Efficiency Strategies to document potential projects and savings.
      • Joint Energy Efficiency Plans (JEEPs)
  • Identified and educated active trade allies to simplify equipment SPEC, quote and invoicing collection.
Xcel Oil & Gas Campaign Customers

- **Producers:**
  - OXY
  - XTO Energy
  - Chevron
  - Devon
  - Conoco Phillips
  - Apache
  - COG
  - EOG
  - Marathon (BOP)
  - Mack
  - Devon
  - Cimarex
  - Mewbourne
  - WPX Energy
  - Matador
  - Legacy Reserves
  - Linn Operating
  - Agave
  - BTA Operating
  - Harvard
  - Targa
  - Zoquillo

- **Mid-streams/Pipelines:**
  - DCP Midstream
  - Lucid
  - Sendero
  - Enterprise
  - Matador
  - NGL (Mesquite)
  - Plains

- **Vendors:**
  - EPIC
  - TankLogixs
  - Schlumberger
  - Viking
  - ABB
  - Alpha Energy Solutions
## Xcel Energy Oil & Gas Program- Customer kWh Savings

<table>
<thead>
<tr>
<th>Sum of Customer kWh</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NM - Custom Efficiency - Motors</td>
<td>2,043,612</td>
<td>284,859</td>
<td>1,379,473</td>
<td></td>
<td>3,707,944</td>
</tr>
<tr>
<td>NM - Motors and Drives – Prescriptive</td>
<td>2,738,473</td>
<td>9,199,661</td>
<td>9,731,620</td>
<td>4,953,225</td>
<td>26,622,979</td>
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<tr>
<td>Grand Total</td>
<td>4,782,085</td>
<td>9,484,520</td>
<td>11,111,093</td>
<td>4,953,225</td>
<td>30,330,923</td>
</tr>
</tbody>
</table>

• 22 customers received rebates
• 135 Projects
  • 490+ Prescriptive Drives
  • 6 Custom Drives (200-1650hp)
Xcel Oil & Gas Projects - Producer Examples

- Prescriptive VFDs
  - VRUs (Vapor Recovery Units)
    - 5hp – 150hp
  - Fluid Pumps (CTBs and SWDs)
    - 25hp – 200hp

- Custom*
  - 4 - Jet Pump (Hydraulic) to ESP (Electric Submersible) 200hp
  - Savings per VFD: 84 kW
  - Rebate per VFD: $33,600
  - SWD (Saltwater Disposal) injection pumps
    - Savings per VFD: 95 kW
    - Rebate per VFD: $38,000

*individual sites savings and rebate vary based on volume and flow

- Customer Example:
  - Installed 10 new CTBs in 2019
  - VFDs Per site:
    - 2 - 150hp
    - 1 - 75hp
    - 3 - 7.5hp
  - Rebate per site:
    - $28,990
Xcel Oil & Gas Projects - Midstream/Pipeline Examples

- Prescriptive VFDs
  - VRUs (Vapor Recovery Units)
    - 10-150hp
  - Fluid Pumps (SWDs)
    - 5-200hp

- Custom*
  - Acid Gas Compressors
    - 1650 hp
      - Savings- 159.2 kW
      - Rebate: $63,660
      - *(individual sites savings and rebate vary based on flow)

- Customer Example:
  - Completed new Midstream in 2018
    - 6- 50hp
    - 5- 40hp
    - 18- 30hp
  - Rebate per site:
    - $107,000
Poll Question

• Are there opportunities/will your utility work to get more production sites connected to the grid, when the economy starts to recover?
• Raise your hand if you would like to comment
Comments or Questions?