The Changing Nature of Energy in Oklahoma
Oklahoma and Energy

- As the U.S. energy landscape evolves, Oklahoma’s contribution is transforming as well.

- From oil and natural gas to wind resources, Oklahoma is an important producer of both traditional and renewable fuels.
Oil Production Begins in OK

- **Nellie Johnstone No.1**
  - Drilled in April 1897
  - Discovery well for the Bartlesville-Dewy Field
  - Became commercially profitable in May 1900
    - Due to the construction of the railroad to Bartlesville in 1899
  - Field produced more than 100,000 barrels

- “In the 10 years between the Nellie Johnstone and Statehood, Oklahoma became the largest oil-producing entity in the world.”
  - American Oil & Gas Historical Society
  - **Statehood, 1907**

- State oil production peaked in 1927 at 762,000 barrels per day
  - [http://www.ogs.ou.edu/oilgasmilestones.php](http://www.ogs.ou.edu/oilgasmilestones.php)
Oil Today

- Annual production typically accounts for more than 3% of total U.S. production

- 2 of the 100 largest U.S. oil fields
  - Approximately 3% of U.S. reserves as of 2011
  - As of July 2013, Oklahoma was ranked 5\textsuperscript{th} in onshore state crude oil production

- Cushing is a major crude oil trading hub

- Crude oil production has been increasing in OK between 2005 and 2012 (from 61,262 to 89,300 thousand barrels)

www.eia.gov
Projected Oil Prices

Real Petroleum Prices : Crude Oil : West Texas Intermediate Spot

- Reference
- Low resource
- High resource

2011 $/bbl


U.S. Energy Information Administration
Independent Statistics & Analysis
Natural Gas Production Begins in OK

- First commercial use of natural gas
  - 1903

- Natural gas production exceeds oil production (energy equivalent)
  - 1963

- Oil and gas production peaks (combined production equivalent to 1.4 million barrels of oil)
  - 1970

- Natural gas production peaks (1.8 trillion cubic feet)
  - 1990

- Proved reserves doubled between 2000 and 2011 (13,490 Bcf to 29,937 Bcf)

http://www.ogs.ou.edu/oilgasmilestones.php
www.eia.gov
Table: Gross Natural Gas Production (Billion Cubic Feet)
Oklahoma and Natural Gas Today

- One of the top natural gas producers in the U.S.
- Nearly $\frac{1}{10}$ of U.S. production
- More than a $\frac{12}{100}$ of the 100 largest natural gas fields in the country are in OK
- Proved Reserves are increasing
  - As of 2011, OK had approximately 10% of U.S. reserves
    - 8% of natural gas producing wells
    - Ranked 4th in Natural Gas Production
Future of Natural Gas in the U.S.

Figure 4. Total U.S. natural gas production, consumption, and net imports, 1990-2035 (trillion cubic feet)

- **History**
  - Consumption
  - Domestic production

- **2010**
  - 11% increase in consumption
  - Net imports, 2010

- **Projections**
  - Net exports, 2035: 5%

Henry Hub spot market natural gas prices (2010 dollars per million Btu)

- 1990: $3.50
- 2010: $12.50
- 2035: $15.00
Wind
Global - Future of Renewable Energy Use for Electricity

Global installed power generation capacity by renewable source (gigawatts)

- **history**
- **projections**

- **hydroelectric**
- **wind**
- **solar**
- **other**
- **geothermal**

- **2008**
- **2005**
- **2010**
- **2015**
- **2020**
- **2025**
- **2030**
- **2035**
Table 8.2a Electricity Net Generation: Total (All Sectors), 1949-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Renewable Energy Total</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>2000</td>
<td>600</td>
</tr>
<tr>
<td>2010</td>
<td>700</td>
</tr>
</tbody>
</table>

Source: U.S. Energy Information Administration
Wind Today

- OK ranked 7\textsuperscript{th} in wind generated electricity in 2011
- Approximately 7\% of total net electricity generation was from wind
- From September 2012 to September 2013, wind generation in OK increased 51.3\% (from 516 to 781 MW)

www.eia.gov
References

• American Oil & Gas Historical Society
  ○ http://aoghs.org/petroleum-industry-pioneers/first-oklahoma-oil-well

• Energy Information Association
  ○ www.eia.gov

• National Renewable Energy Laboratory
  ○ www.nrel.gov

• Oklahoma Geologic Survey – Energy
  ○ http://www.ogs.ou.edu/oilgasmilestones.php