Coal
A Comparison of Coal in West Virginia and North Dakota

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Charleston, WV
What is coal?

– Fossil fuel formation
– Coal defined
– History of Coal in N.D. and W.V.
– General overview of West Virginia coal beds
Overview

Why care about coal?

– General Overview of North Dakota coal beds
– Why Care About Coal?
  • Overlap
  • Safety
  • Permitting
– Politics
Coal is not the remains of dead dinosaurs
How Coal Was Formed
Millions of years ago, dead plant matter fell into swampy water and over time, a thick layer of dead plants lay decaying at the bottom of the swamp. Over time, the surface and climate of the Earth changed, and more water and dirt washed in, halting the decay process, forming peat.
The weight of the top layers of water and dirt packed down the lower layers of plant matter. Under heat and pressure, this plant matter underwent chemical and physical changes, pushing out oxygen and leaving rich hydrocarbon deposits. What once had been plants gradually turned into coal. Coal can be found deep underground (as shown in this graphic), or it can be found near the surface.

How Petroleum and Natural Gas Were Formed
Tiny sea plants and animals died and were buried on the ocean floor. Over time, they were covered by layers of sediment and rock. Over millions of years, the remains were buried deeper and deeper. The enormous heat and pressure turned them into oil and gas.
Today, we drill down through the layers of sedimentary rock to reach the rock formations that contain oil and gas deposits.
Coal Defined
History of Coal in North Dakota
History of Coal in West Virginia
General Overview
Appalachian Basin – Northern Region

Top 3 producing beds in the upper A-basin

- Pittsburgh
- Upper Freeport
- Lower Kittanning
General Overview

Appalachian Basin – Central Region

Top producing zones in the southern coal fields

- Pocahontas No. 3
- Fire Clay
- Pond Creek
General Overview

• Williston Basin Coal
  - Fort Union group
    (Bullion Creek Formation)
    • Beulah Zap
    • Hagel
    • Harmon/Hansen
General Overview

Electric Power - US


Source: U.S. Energy Information Administration, Electric Power Monthly (March 2013). Percentages based on Table 1.1 and 1.1a; preliminary data for 2012.
General Overview

West Virginia
Underground 16,963
Surface 6,344

North Dakota
Underground 0
Surface 1,169

2011
Why Care About Coal?

Coal Region

Marcellus Shale

Marcellus Center for Outreach and Research, Penn State
www.marcellus.psu.edu
Why Care About Coal?

Coal Region

Bakken Shale

The Bakken Formation was deposited in the more central and deeper portion of the Williston Basin.
<table>
<thead>
<tr>
<th>System</th>
<th>Series</th>
<th>Group/Formation</th>
<th>Thickness</th>
<th>Generalized Lithologies</th>
<th>Names of Selected Units</th>
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<tbody>
<tr>
<td>Permian</td>
<td>Pennan</td>
<td>Dunkard</td>
<td>40 m</td>
<td>Sandstone</td>
<td>Waynesburg coal bed</td>
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<td>Limestone</td>
<td>Little Waynesburg coal bed</td>
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<td>Shale &amp; Silstone</td>
<td>Uniontown coal bed</td>
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<td>Shale</td>
<td>Benwood Limestone</td>
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<td>Siltstone</td>
<td>Sewickley coal bed</td>
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<td>Claystone</td>
<td>Fishpat coal bed</td>
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<td>Coal</td>
<td>Redstone coal bed</td>
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<td>Fireclay</td>
<td>Sandstone in the lower part of the Pittsburgh Formation</td>
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<td>Coal, Coal &amp; Shale</td>
<td>Pittsburgh coal bed</td>
</tr>
</tbody>
</table>

**EXPLANATION**
- Sandstone
- Limestone
- Shale & Silstone
- Shale
- Siltstone
- Claystone
- Coal
- Fireclay
- Coal, Coal & Shale
- No Record

**Diagram:** Generalized Stratigraphic Column with Oil and Gas Reservoirs, West Virginia.
Why Care About Coal?
Why Care About Coal?

Safety
Why Care About Coal?

Permitting

– W.Va. Code §22-6A-7(a) – It is unlawful for any person to commence any well work, including site preparation work which involves any disturbance of land, for a horizontal well without first securing from the secretary a well work permit. (b) Every permit shall contain the following...(2) the names and addresses of every coal operator operating coal seams under the tract..., and the coal seam owner of record and lessee of record...

– W.Va. Code 22-6-12(a) – Before drilling for oil or gas, or fracturing a well, a well operator shall have a plat prepared...and said plat shall be forwarded to each and every coal operator operating coal seams beneath said tract of land,...and the coal seam owner of record and lessee of record...
Why Care About Coal?

Permitting

- N.D.C.C. 38-15-01 et seq. – Resolution of Conflicts in Subsurface Mineral Production

- N.D.C.C. 38-12-03. Permit Required. It is unlawful to commence operations for the exploration, development, or production of subsurface minerals without first obtaining a permit from the direct of mineral resources, an paying to the commission a fee for each such permit.

- N.D.C.C. 38-08-05. 1. Drilling Permit Required. A person may not commence operations for the drilling of a well for oil or gas without obtaining a permit from the industrial commission and paying to the commission a fee for each well in an amount to be determined by the commission. The applicant shall provide notice to the owner of any permanently occupied dwelling located within 1320 feet of the proposed oil or gas well.
Why Care About Coal?

Politics
Thank You!

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