

Interstate Oil & Gas Compact Commission Mid-Year Issues Summit

James Ladlee, Penn State
Marcellus Center for Outreach & Research

June 4, 2012

Vancouver

Why Not

- Geologist
- Attorney
- Financial advisor
- Engineer
- Industry representative

Why

- Bring a “Big Picture” perspective
- Intensive work with oil and gas workforce initiatives
- Trained tens of thousands of people on shale
- Worked with hundreds of companies in all aspects of the oil and gas development
- Out in the field



Overview

- Penn State shale history
 - History
 - Stakeholders
- What we do now
- Results

FINISHED FILES ARE THE RESULT OF YEARS OF SCIENTIFIC STUDY COMBINED WITH THE EXPERIENCE OF MANY YEARS.

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History

- Penn State Extension
 - Landowner leasing
 - Marcellus Education Team (MET)
- Penn State University
 - Marcellus Center for Outreach and Research
 - Penn State Marcellus Education Consortium
- Penn State Extension and The Pennsylvania College of Technology
 - Marcellus Shale Education and Training Center
 - ShaleNET
- Resident Education (EMS)

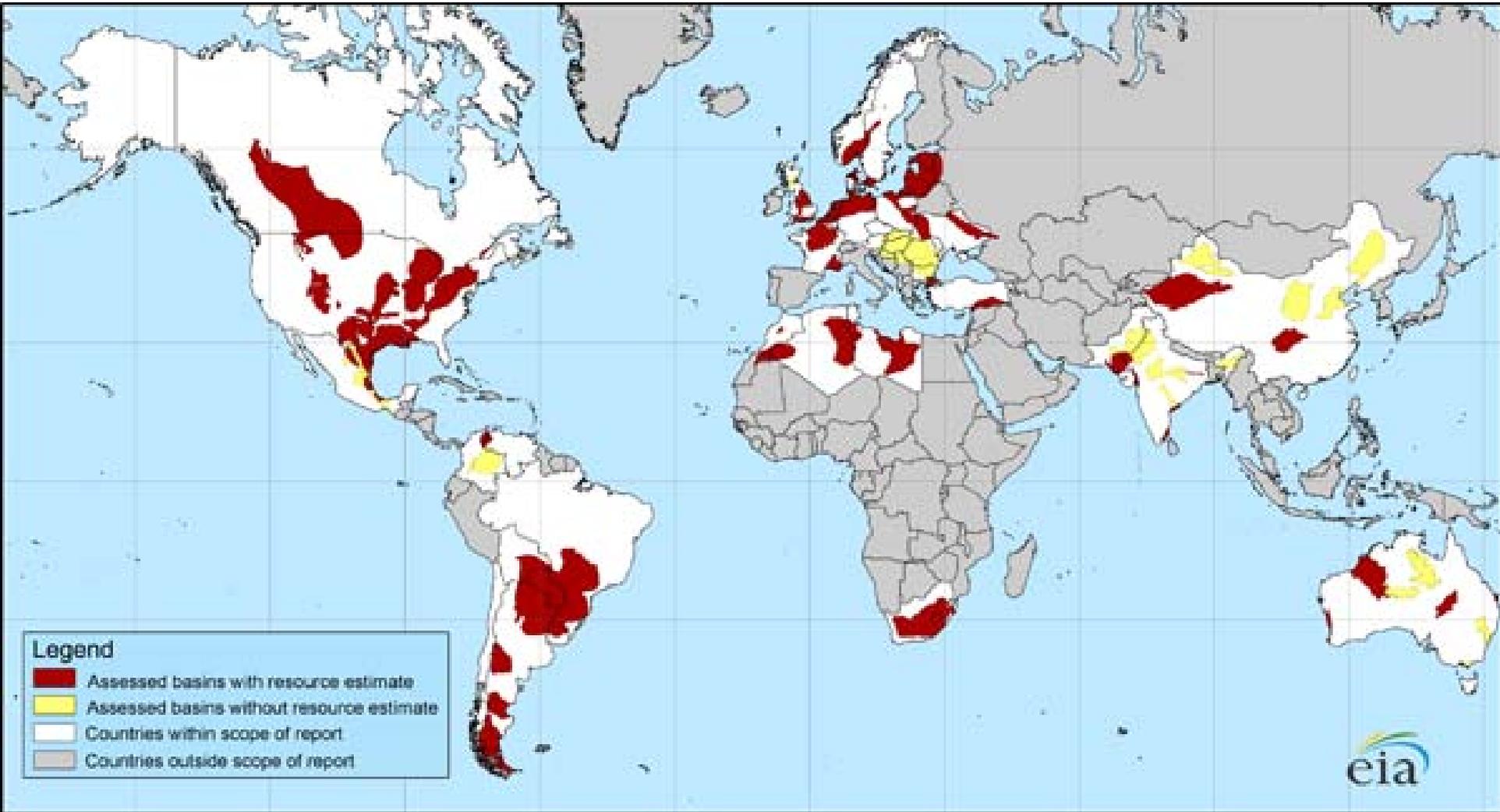
Stakeholders

- Land and mineral owners
- Elected officials
 - State legislators across the Appalachian Basin
 - Federal legislators
 - Local elected officials
 - County Commissioners Association
 - State Association of Township Supervisors
 - Planning Commissions
- Federal, state, and local government agencies
 - Environmental Protection Agency
 - Department of Labor
 - Department of Community and Economic Development
 - Department of Agriculture

Stakeholders

- Industry
- All media (newspaper, television, radio, magazine, etc...)
- Business leaders/entrepreneurs
- Banking
- Venture capital
- Railroad
- Education (primary, secondary, university)
- Legal
- Environmental/NGO's
- Interested citizens/public meetings

Outreach and Research

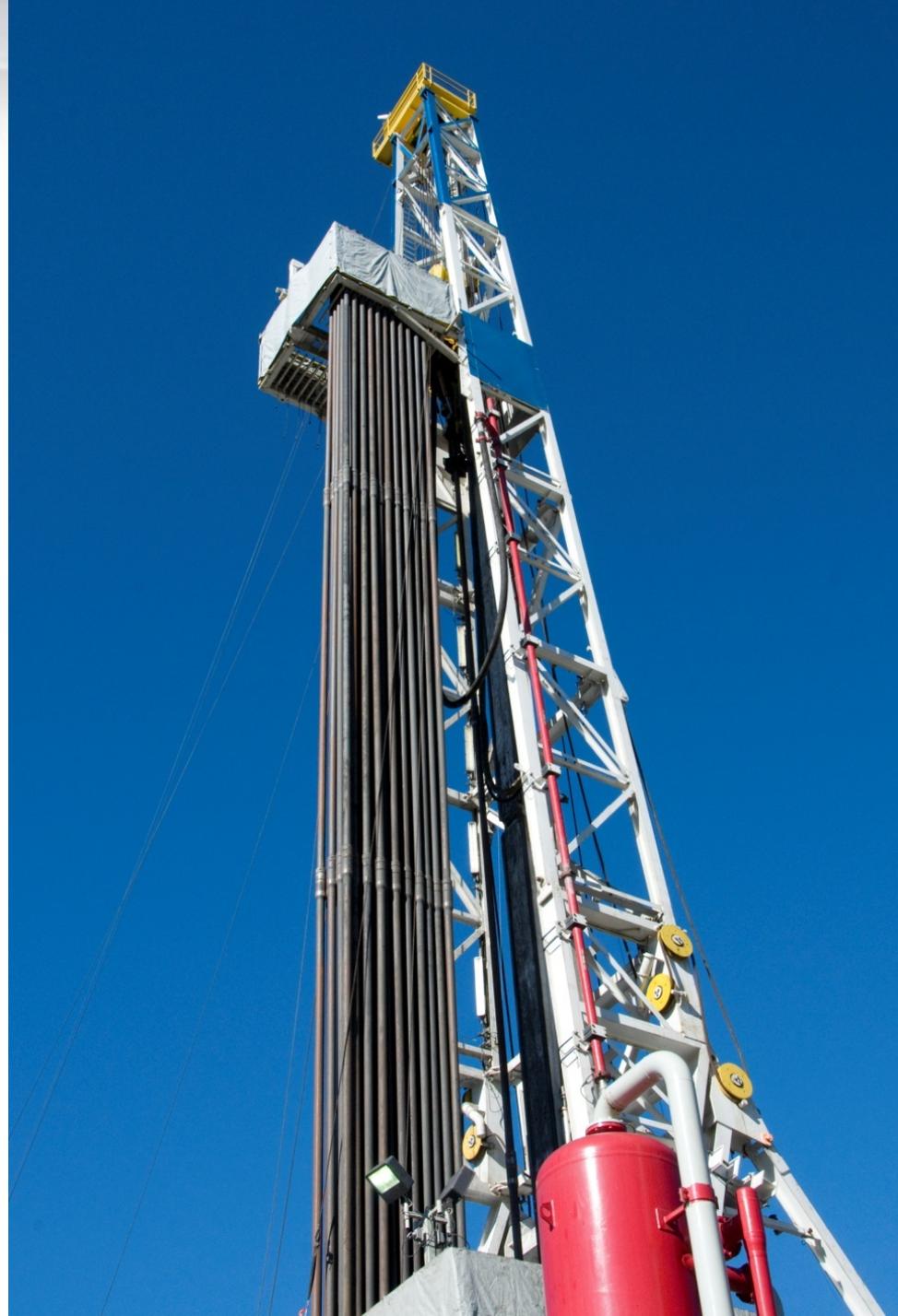


Source: <http://www.eia.gov/analysis/studies/worldshalegas>

Penn State **Extension**

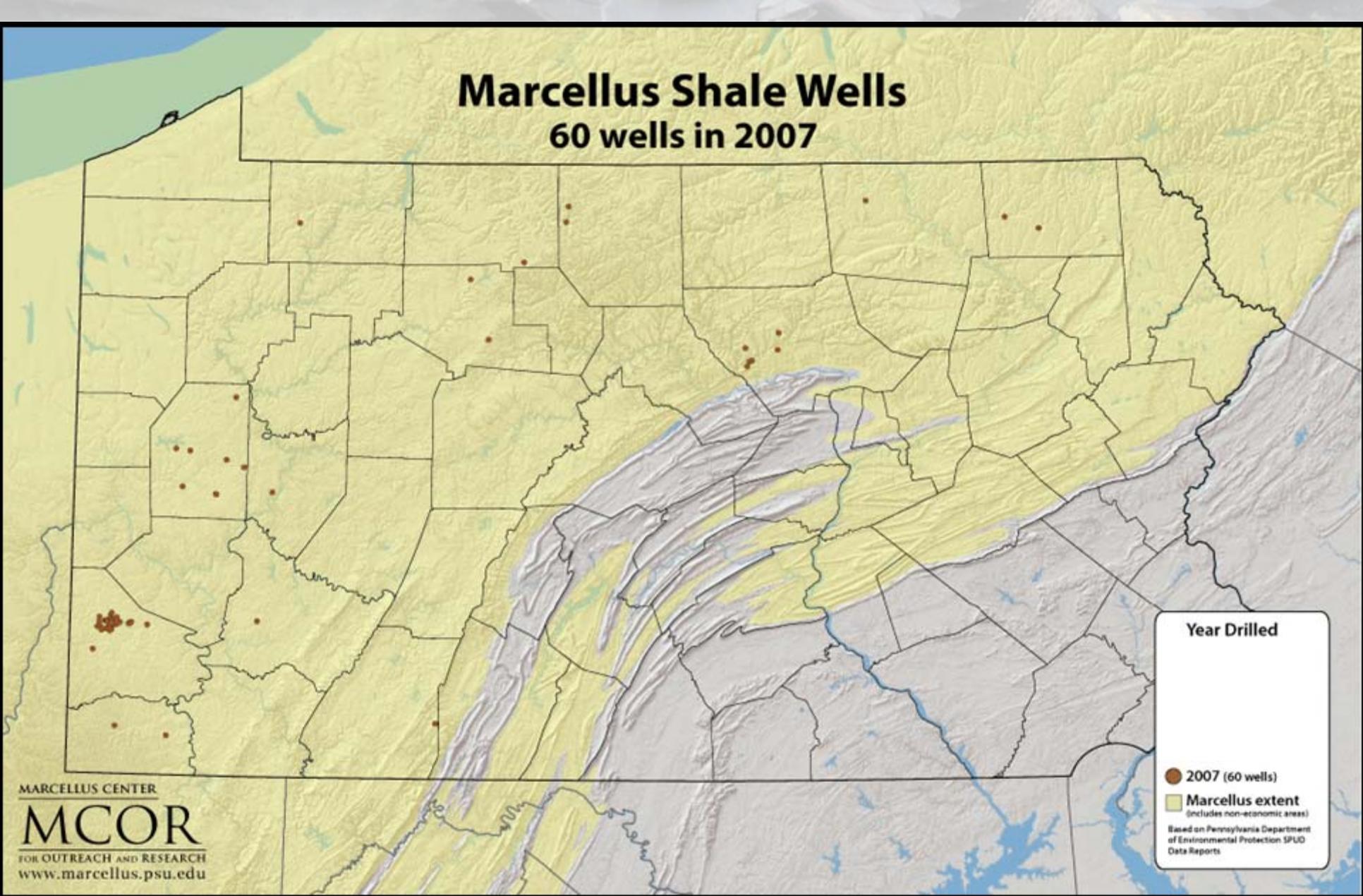
Outreach & Research

- Development patterns
 - E&P vs. subcontractor
 - Hot spot vs. overall
 - Development type
 - Appalachian Basin
 - Regional offices/centers
 - Field offices
 - Field location
 - Pace
 - Price
 - Inventory
 - Production
 - Utilization



Marcellus Shale Wells

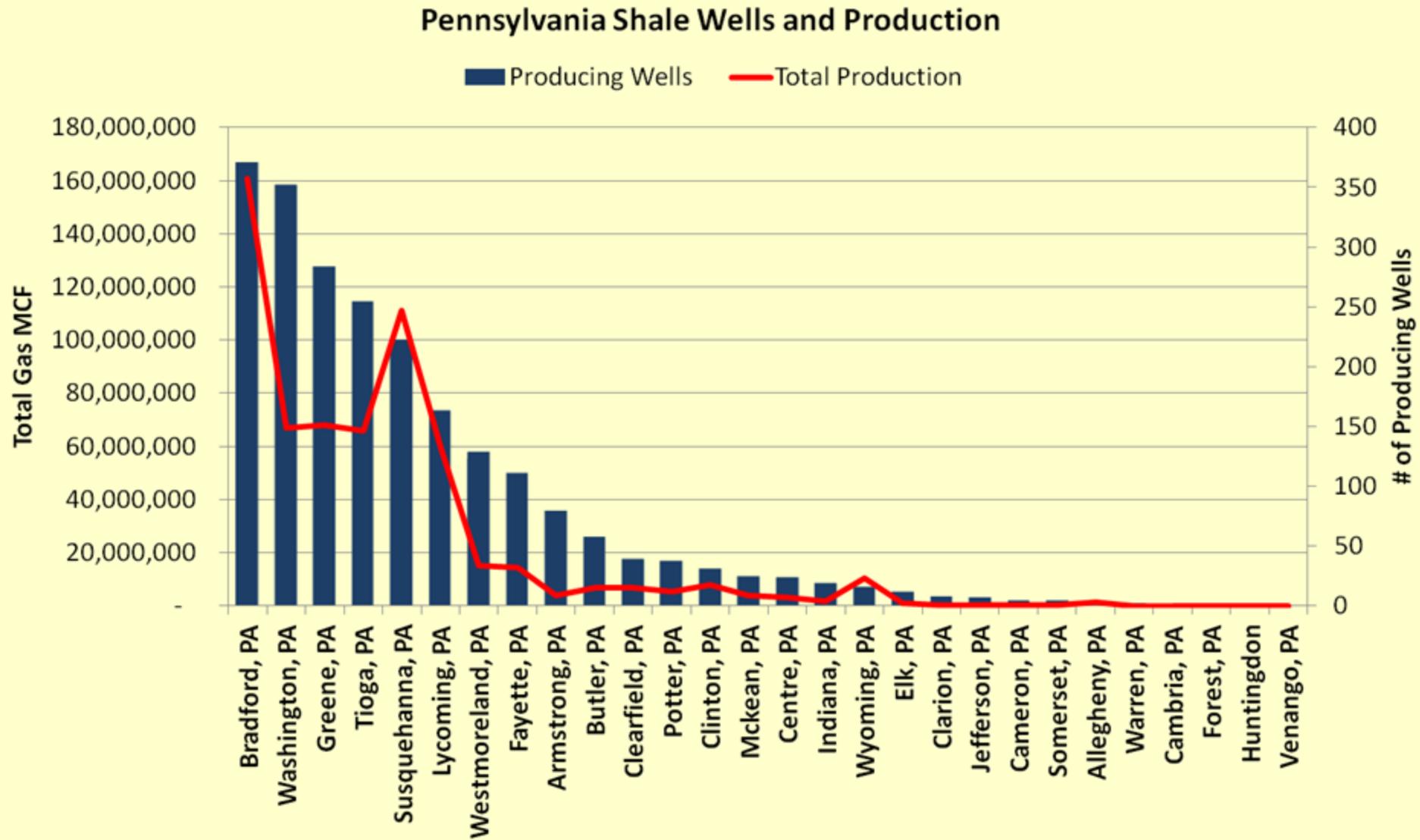
60 wells in 2007



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www.marcellus.psu.edu



Marcellus Production in PA

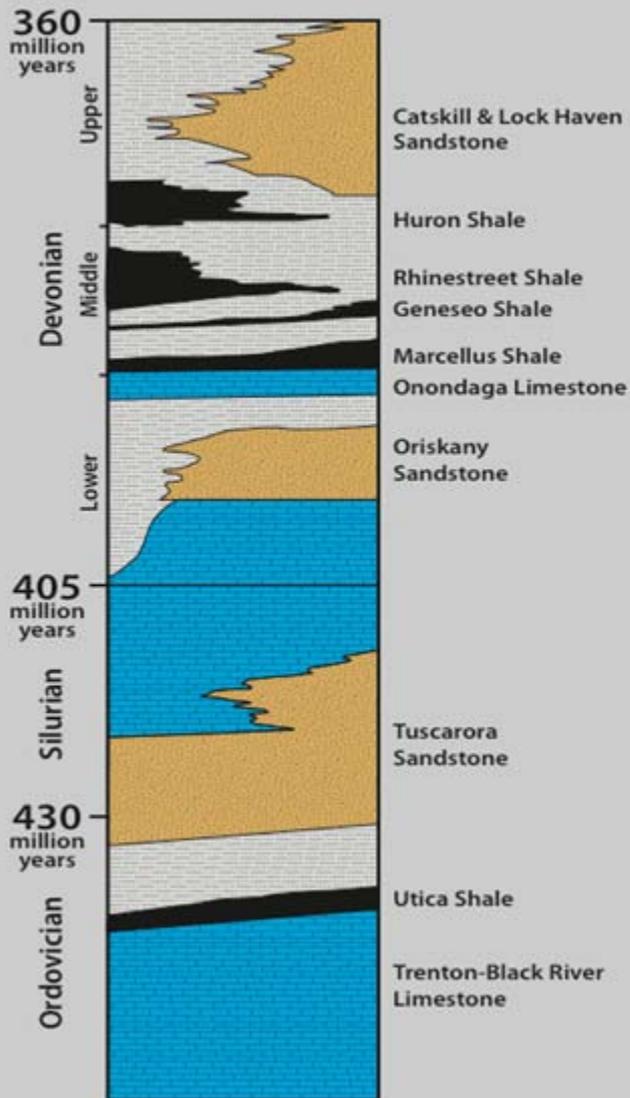


Source: PA DEP Production Data July-December, 2011

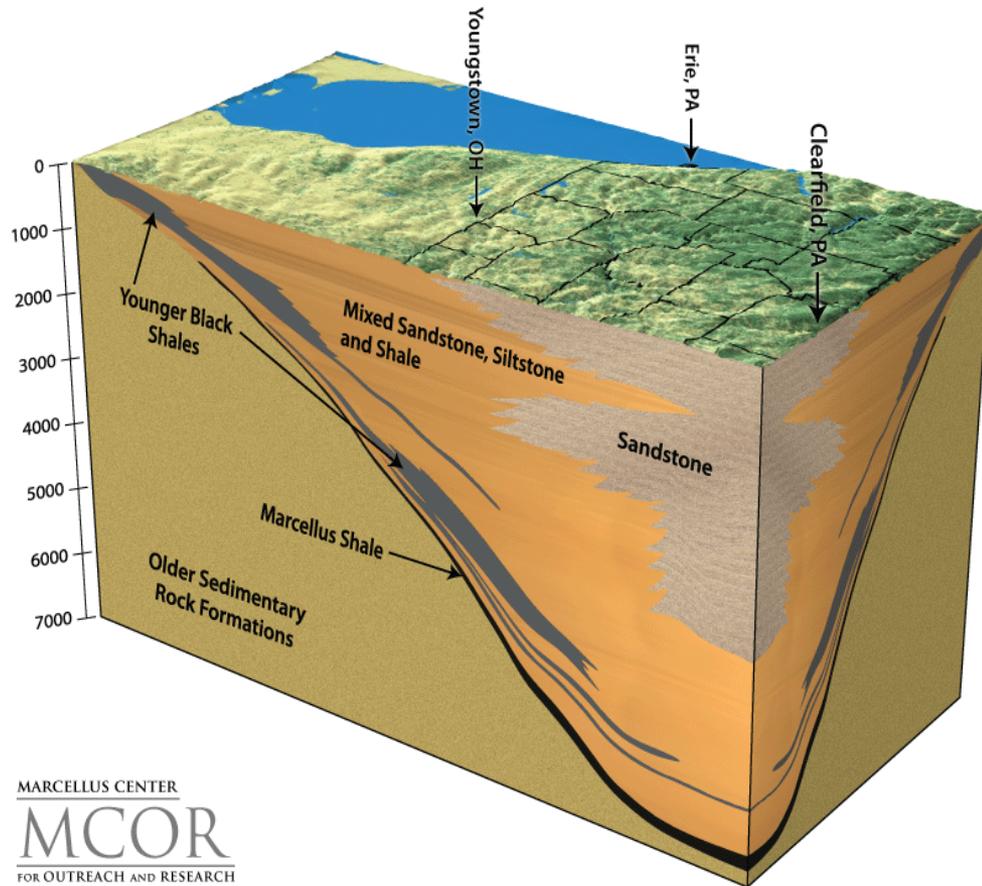


Other Shale Targets

Key Gas-Producing Formations in Pennsylvania



Generalized Geologic Cross Section Showing Marcellus Shale in Western Pennsylvania



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Outreach & Research

- International interest
- Economic development patterns
- Drilling & production
- Other shale formations
- **Ground water & surface water**



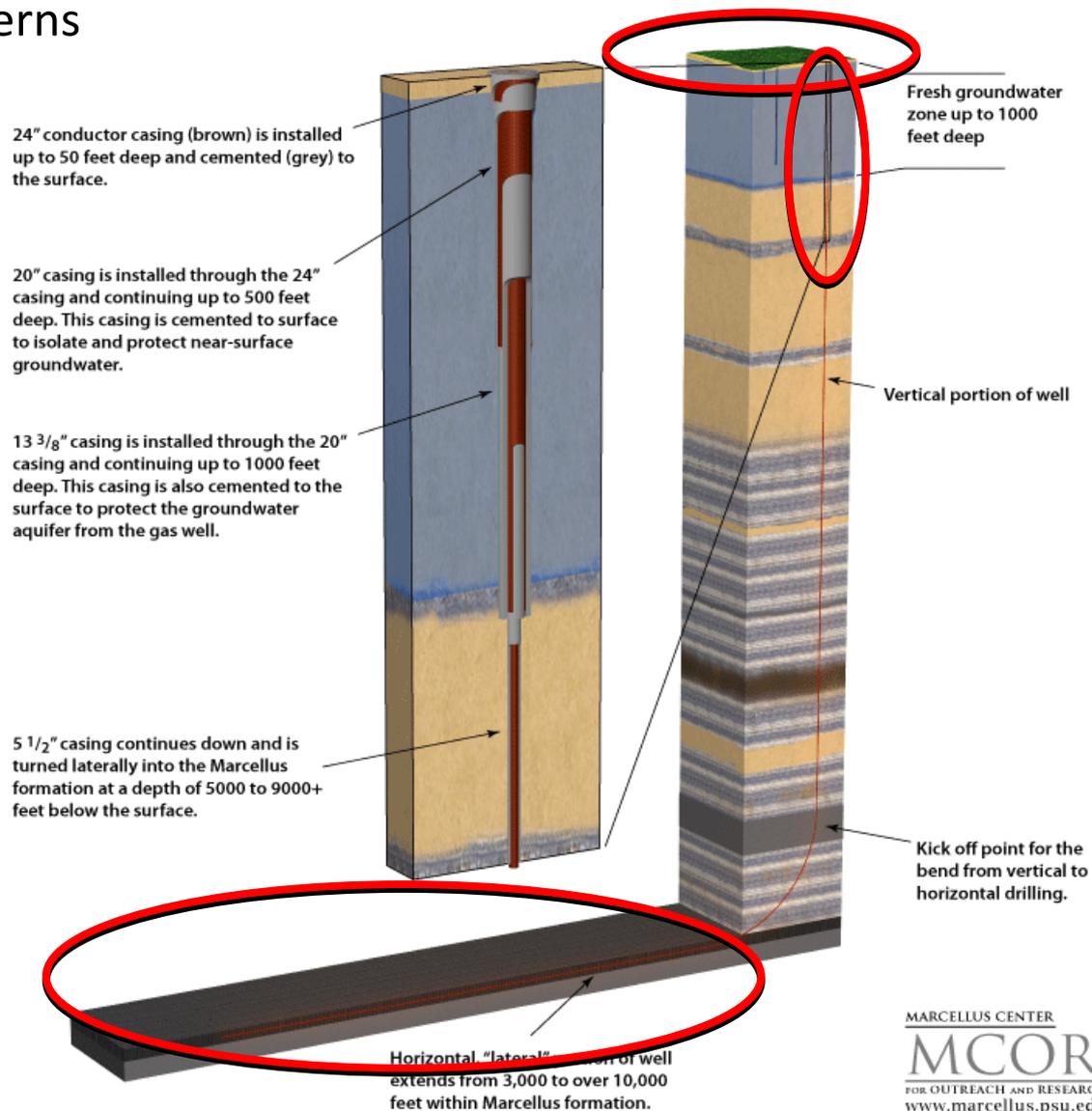
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- **Water treatment & reuse**



Outreach & Research

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- Ground water & surface water
- Water treatment & reuse
- **Air emission questions**

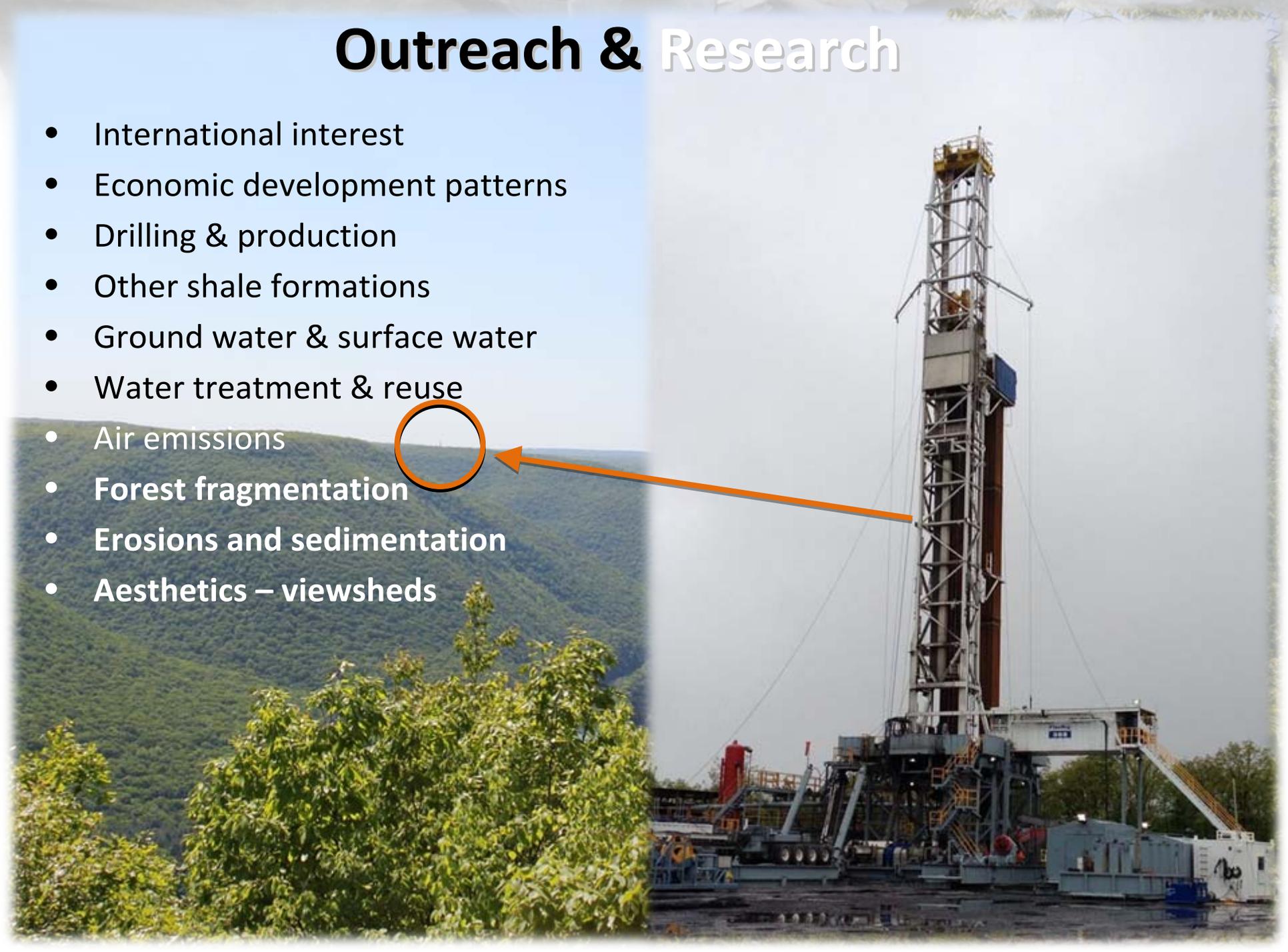


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- Water treatment & reuse
- Air emissions
- **Forest fragmentation**
- **Erosions and sedimentation**
- **Aesthetics – viewsheds**

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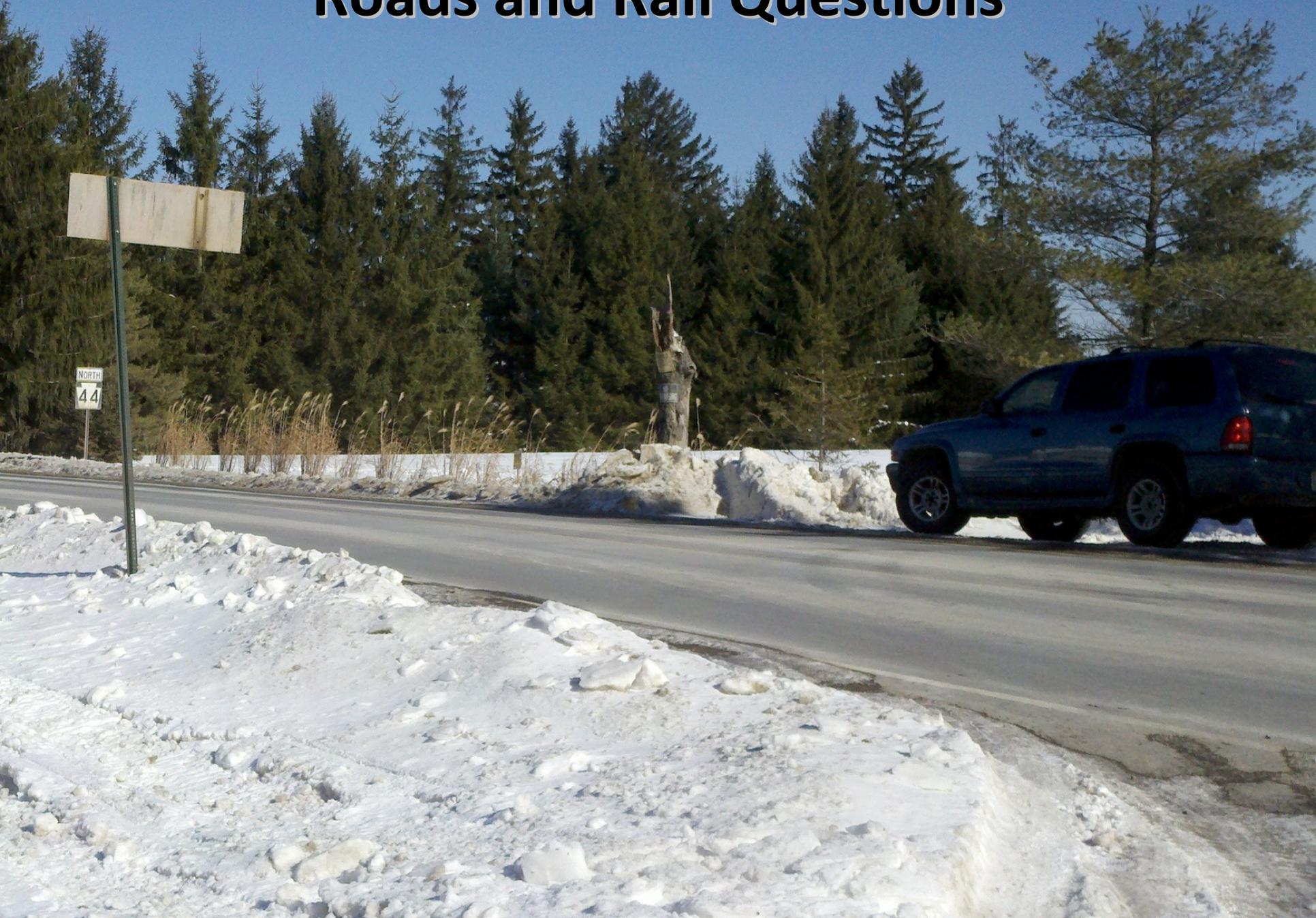


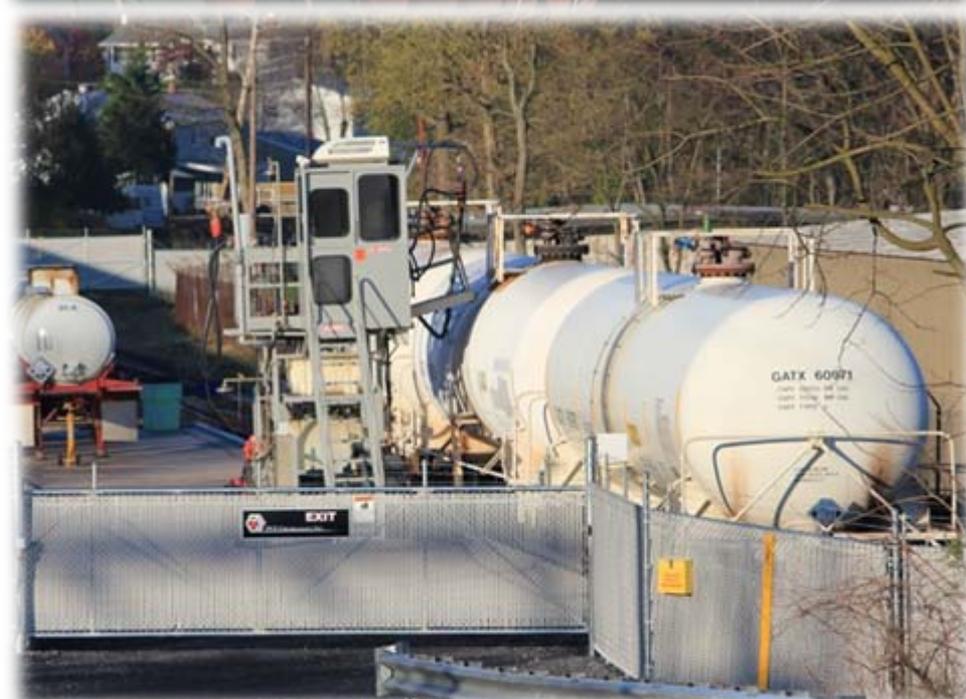
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- **Road and rail**



Roads and Rail Questions





Outreach & Research

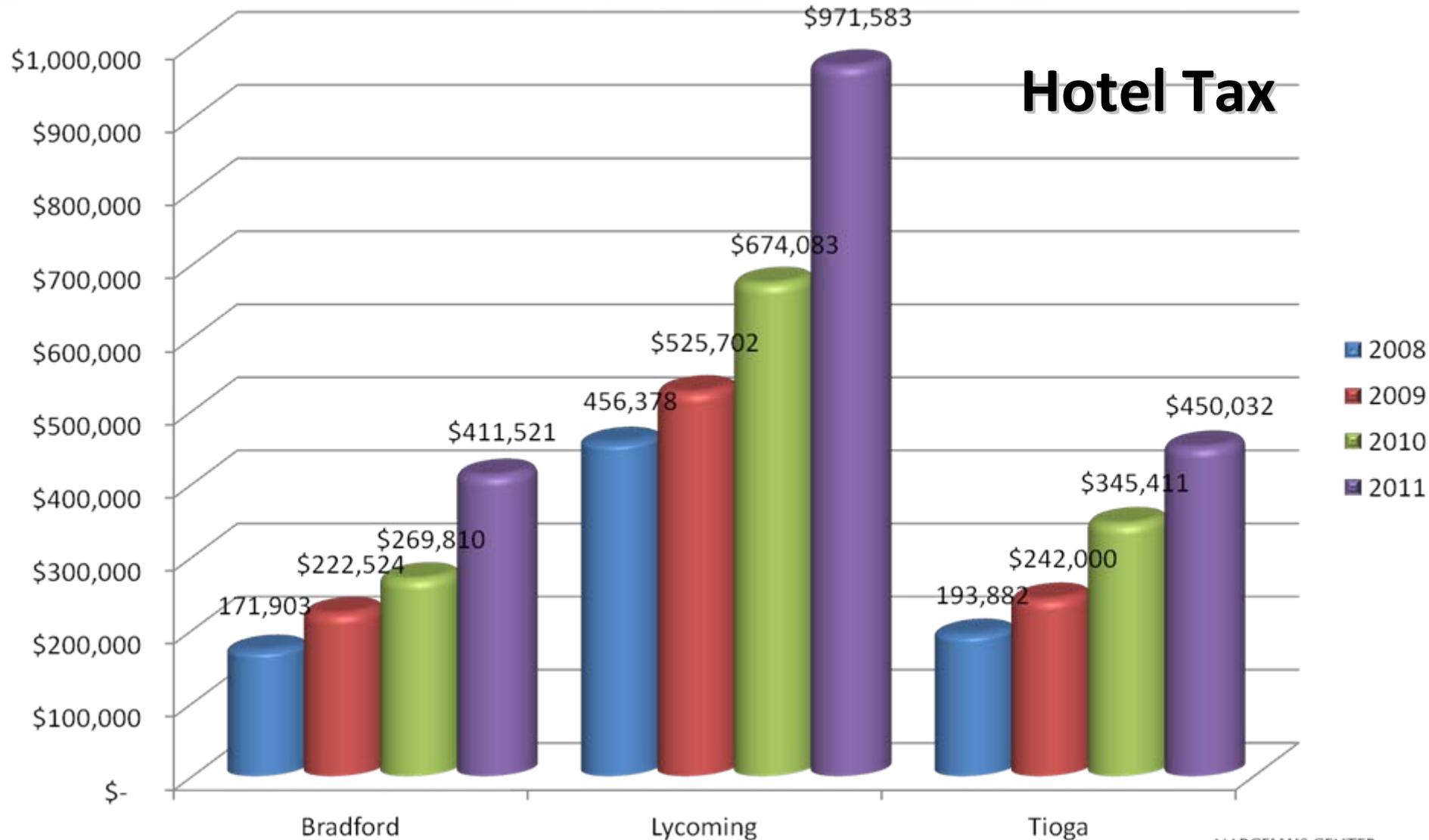
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- Roads
- **Pipeline**



Outreach & Research

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- Roads
- Pipeline
- **Norm/T-Norm**
- **Induced seismicity**

Outreach & Research



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- Pipeline
- Norm/T-Norm
- Induced seismicity
- Tax
- **Well completion**

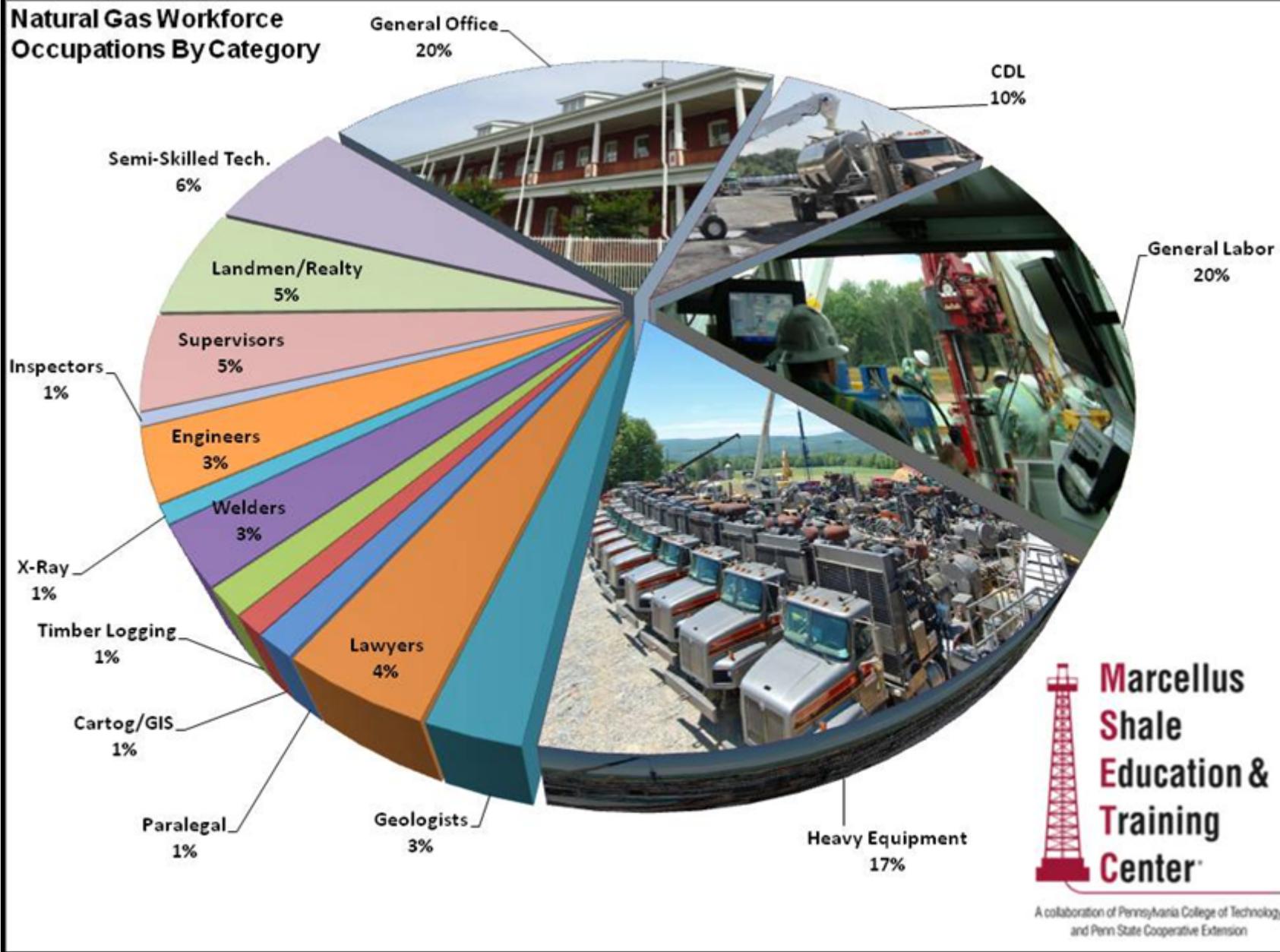


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- Aesthetics – viewsheds
- Roads and rail
- Pipeline
- Norm/T-Norm
- Induced seismicity
- Tax
- Well completion
- **Workforce**
- **AND MORE...**



Natural Gas Workforce Occupations By Category



A collaboration of Pennsylvania College of Technology and Penn State Cooperative Extension

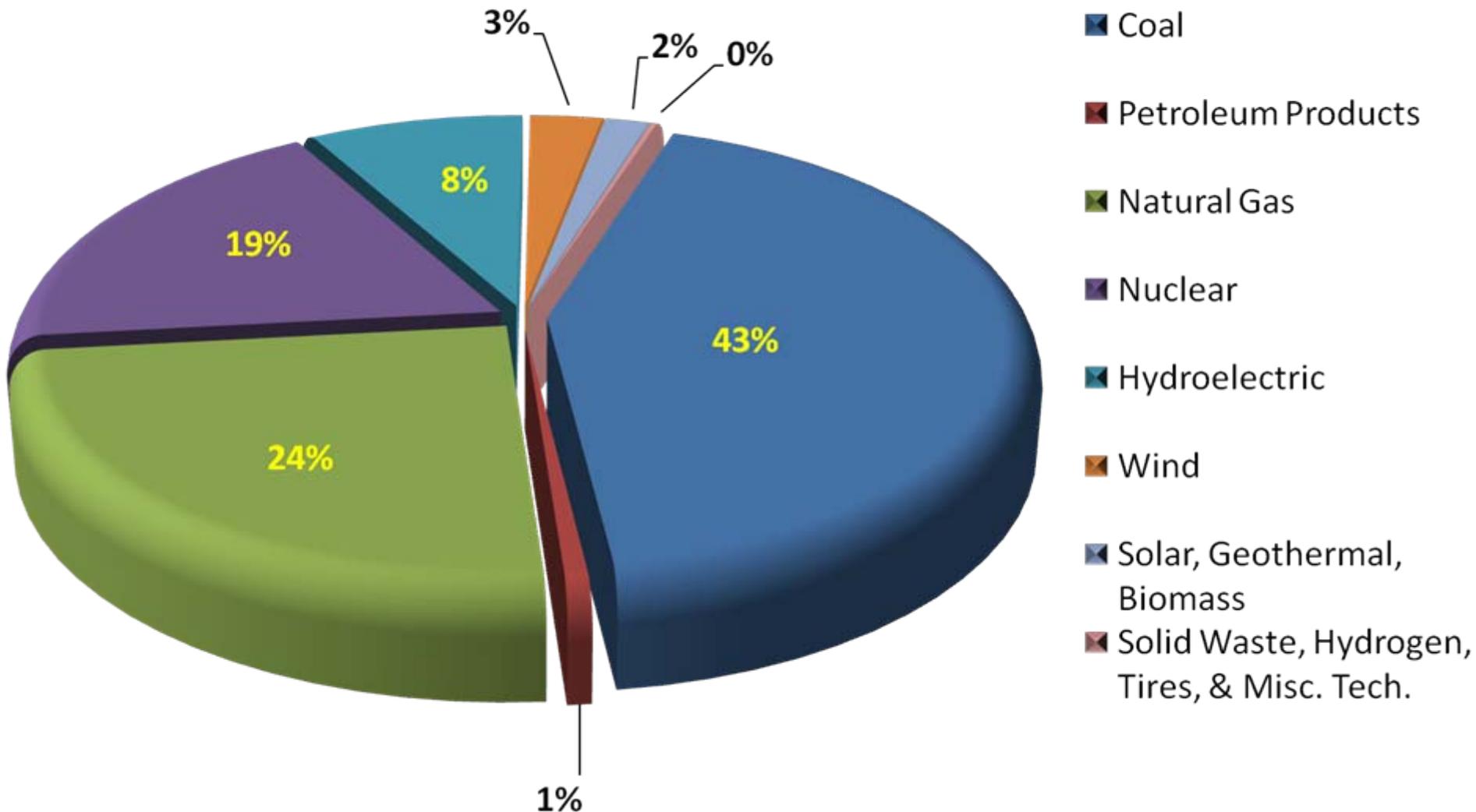
Source: Pennsylvania Marcellus Shale Workforce Needs Assessment <http://www.msetc.org/>

Penn State Extension

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More Than Natural Gas

Net Generation By Source, 2011





Impact

- Research
 - Marcellus geology and appropriate technologies
 - Manufacturing and supply of materials for fracturing
 - Legacy implications for the environment
 - Local and regional impacts and quality of life
 - Transportation, development, and environment
 - Worker housing
 - Natural gas utilization
 - Public and industry health
 - Industry best management practices
 - Community socio-economic & workforce
 - Seed grant program



Impact

- Outreach and education
 - Provided dozens of conferences and webinars
 - Organized hundreds of tours
 - Trained hundreds of educators
 - Thousands of presentations & eNews subscribers
 - 400,000+ face-to-face contacts
 - 300,000+ social media contacts
 - 2 million+ media contacts
 - Trained 5,000+ people for jobs

Thank You

Questions Contact:

Jim Ladlee

jladlee@psu.edu

(814) 470-3459

- www.marcellus.psu.edu
- www.msetc.org
- www.naturalgas.psu.edu

