On The Road to Sustainable Development: Improving Environmental Regulation of China’s Shale Gas Development

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Composition of China’s Energy Consumption in 2014

- 煤炭, 66.00%
- 石油, 17.10%
- 天然气, 5.70%
- 一次电力及其他能源, 11.20%
Recognize the environmental risks
Improve the legal system
Implement strict environmental management
Encourage society to play a role in supervision

Environmentally-Friendly Development

Road to the Environmentally-Friendly Development of Shale Gas
1. RECOGNIZE THE ENVIRONMENTAL RISKS
1.1 Recognize and Analyze the Total Environmental Impact
1.2 Environmental Impact Assessment Strategy for Shale Gas

- Relevant Departments: Ministry of Environmental Protection, National Energy Administration, Ministry of Land and Resources, Ministry of Water Resources, China Earthquake Administration.

- Develop a joint environmental impact assessment strategy for shale gas resources

- Consider ecology, environment, water resources, soil quality, population density, and disaster risk to create overall environmental and resource limitations
2. IMPROVE THE LEGAL SYSTEM USED TO REGULATE SHALE GAS
### US Shale Gas Environmental Regulation: Legal System

#### Federal Level

<table>
<thead>
<tr>
<th>Regulations</th>
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<tbody>
<tr>
<td>Water Quality Regs</td>
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<tr>
<td>Safe Drinking Water Act, Clean Water Act, Resource Conservation and Recycling Act</td>
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<td>Air Quality Regs</td>
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<tr>
<td>Clean Air Act, Ambient Air Quality Standards, Pollutant Emission Standards</td>
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<tr>
<td>Environmental Emergency Response</td>
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<tr>
<td>Comprehensive Environmental Response, Compensation and Liability Act</td>
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<tr>
<td>Env. Impact Assessments</td>
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<tr>
<td>National Environmental Protection Act</td>
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#### State Level

- Implement Federal Regulations
- Set State Standards for Oil and Gas Development, Permitting
- Establish state plans

#### River Basin Commissions and Local Government

- Follow federal and state regulations
- Can establish additional regulations

Some important exemptions and unregulated areas need to be strengthened.

States Play a Key Role in Oil and Gas Regulation:
States are strengthening and revising regulations.
States use oil and gas well and fracking permits and environmental permits to regulate environmental impacts and ensure standards are met, including:

- Oil and gas well drilling permits/hydraulic fracturing permits
- Environmental permits (water use permits, waste water permits, air emission permits, underground wastewater injection, stormwater discharge permits, oil-based drilling fluid/mud and solid waste discharge permits, etc.)
# China Shale Gas Environmental Regulation: Players and Roles

<table>
<thead>
<tr>
<th><strong>National Level Laws and Technical Guidelines</strong></th>
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<tr>
<td>Environmental Protection Law, Mineral Resource Law, Water Pollution Law, Air Pollution Law, Environmental Impact Assessment Law</td>
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<tr>
<td>“EIA Guidelines for Land-Based Oil and Gas Development Projects,”</td>
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<tr>
<td>“Oil and Gas Development Pollution Prevention Technology Policy”</td>
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<th><strong>Local Level Regulations</strong></th>
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<td>Regulations for environmental protection for land-based oil and gas exploration and development</td>
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<th><strong>Industry Level Standards, rules, and recommended practices</strong></th>
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<th><strong>Enterprise Level Corporate Health, Safety, and Environment (HSE) standards</strong></th>
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**In practice**

Shale gas regulation in China characterized by:

1. EIAs as the Gateway for Entry
2. Oil and Gas Companies Self Management
Environmental Impact Assessments Are Not Yet Playing An Effective Role

### Legal Basis

- Environmental Protection Law (amended in 2014)
- Environmental Impact Assessment Law

### EIA Type

- Construction Project EIA Category List
- List of Construction Projects Directly Approved by Ministry of Environmental Protection (2009)

### Shale gas projects require EIAs, but only on a per-well basis
- Development may occur at the same time as the EIA is being conducted
- Projects may be broken into smaller parts so that EIAs can be approved at a lower level
- Shale gas development areas have not publicly released larger-scale strategic/plan EIAs

### Technical Guidelines

Shale Gas-Specific EIA Guidelines and Related Pollutant Control Standards do not exist

At present, EIAs follow the *Land-Based Oil and Gas Development Project EIA Technical Guidelines*, which do not specify shale-gas/fracking specific concerns.
2.2.3 Environmental Management of Shale Gas Will Need Unified Standards and Effective Supervision

The entrance of unconventional oil & gas companies and private capital will require a unified set of standards and guidance from the central government.

- Unconventional oil & gas companies and private enterprises don’t understand the substantial risk that shale gas poses to the environment.

Environmental supervision at drilling sites is not in place.

- There aren’t professional third-party groups that can supervise the entire drilling process at each well.
2.3 Establishing and Improving Environmental Management and Legislation

- Guidelines for shale gas environmental impact assessments
- Standards for shale gas pollutant emissions
- Provisional measures for environmental management of shale gas
- Publication of the contents of hydraulic fracturing fluids
3. IMPLEMENT STRICT ENVIRONMENTAL MANAGEMENT MEASURES
Environmental Management is Needed for All Parts of the Drilling Process
4.3 Implement Strict Supervision for the Entire Process of Shale Gas Development

- Exploration and site selection phase
- Availability of water resources
- Safe setback distances
- Environmental baseline testing
4.3 Implement Strict Supervision for the Entire Process of Shale Gas Development

- Drilling
- Well casing and cement integrity
- Cement depth
- Well casing and cement monitoring
4.3 Implement Strict Supervision for the Entire Process of Shale Gas Development

- Fracturing
  - Water procurement
  - Publication of fracking chemicals
- Storage, treatment, and handling of fracking fluid
  - Water storage pools/tanks
  - Water recycling
  - Underground injection
- Reduction of methane emissions from well sites (using green methods)
4.3 Implement Strict Supervision for the Entire Process of Shale Gas Development

- Plugging abandoned wells
  - Wellbore plugging
  - Site restoration
  - Safety markings
  - Tracking system
4. SOCIETAL SUPERVISION OF SHALE GAS UNDER THE NEW ENVIRONMENTAL LAW
4.4 Societal Supervision of Shale Gas Under the New Environmental Law

- Obtain environmental information
  * Publish all environmental reports

- Participate in environmental protection
  * Public participation in environmental impact assessments

- Supervise environmental protection
  * Report pollution behavior
  * Environmental public interest legislation
ESTABLISH A COMPREHENSIVE SHALE GAS PILOT AREA AND IMPLEMENT INTERIM ENVIRONMENTAL REGULATIONS, DRAFT STANDARDS, AND ENVIRONMENTAL TECHNOLOGIES WITHIN PILOT AREA.
THANK YOU

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