

# Redefining Responsible Oil and Gas Development

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We propose a new framework based on a phased energy development strategy guided by the precautionary principle and adaptive management, and backed by an updated suite of economic instruments based on the polluter pays principle.

## GOALS

1. Promote more sustainable economic development by mitigating boom and bust cycles --and avoiding the resource curse;
2. Internalize negative externalities (hidden costs) into supply curve;
3. Manage risk by reducing exposure to hazards, managing emergent technological risks, and decreasing uncertainty; and
4. Compensate our children and grandchildren for the use of fossil fuels that could have been available to them.

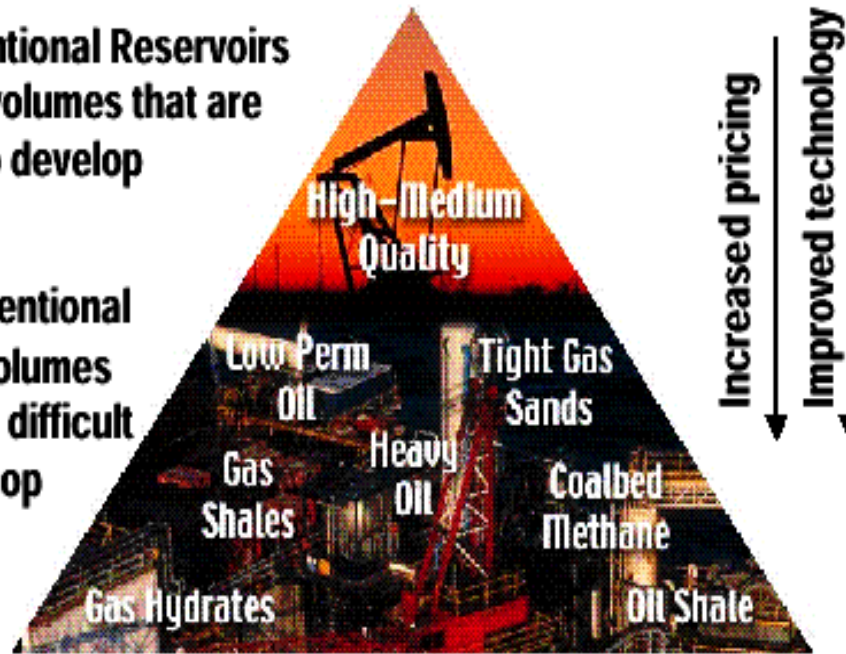
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# Resource Triangle

**Conventional Reservoirs**  
Small volumes that are  
easy to develop

**Unconventional**  
Large volumes  
that are difficult  
to develop

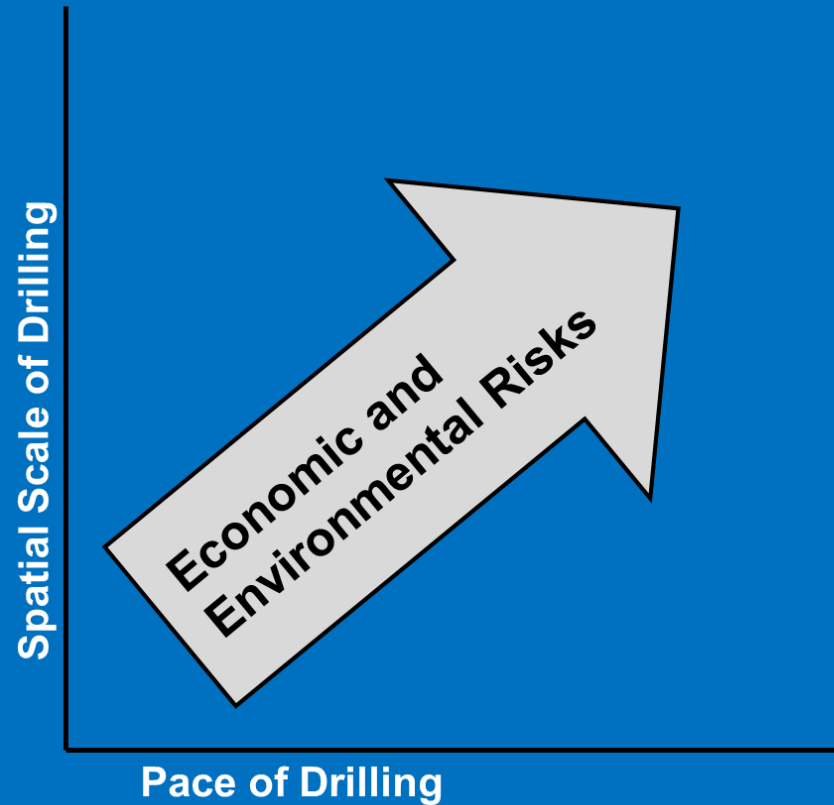


**Increasing Negative Externalities**  
**Increasing GHG Emissions**

**Resource triangle (from Holditch, 2006; after Masters [1979] and Gray [1977]).**

“...science tells us that greenhouse gas emissions are an **externality**; in other words, our emissions affect the lives of others. When people do not pay for the consequences of their actions we have market failure. This is the **greatest market failure the world has seen.**” Sir Nicholas Stern, UK Treasury, October 2006

# Phased Energy Development: Regulating the Pace and Scale of Drilling



Pace and scale of drilling are key variables in determining the economic development impacts and the magnitude of externalized damages to the environment and to public health. Faster and bigger are not always better.

Source: Klopf, Culver and Morton (2007); Haefele and Morton, (2009), Morton and Kerkvliet (forthcoming)

# Phased Energy Development: Regulating the Pace and Scale of Drilling

Phased development can be implemented by:

- Placing some areas off-limits to drilling
- Capping number of wells allowed to control for cumulative effects
- Allowing new wells only after old ones are closed and site fully restored
- Full disclosure
- Collecting baseline data – environmental, health, socio-economic
- Monitoring, Inspection and Enforcement
- Adjusting pace and scale based on monitoring results

Source: Haefele and Morton, (2009), Morton and Kerkvliet (forthcoming)

# Slowing the Pace and Scale of Drilling Provides a more Sustainable Economic Development Path for Communities

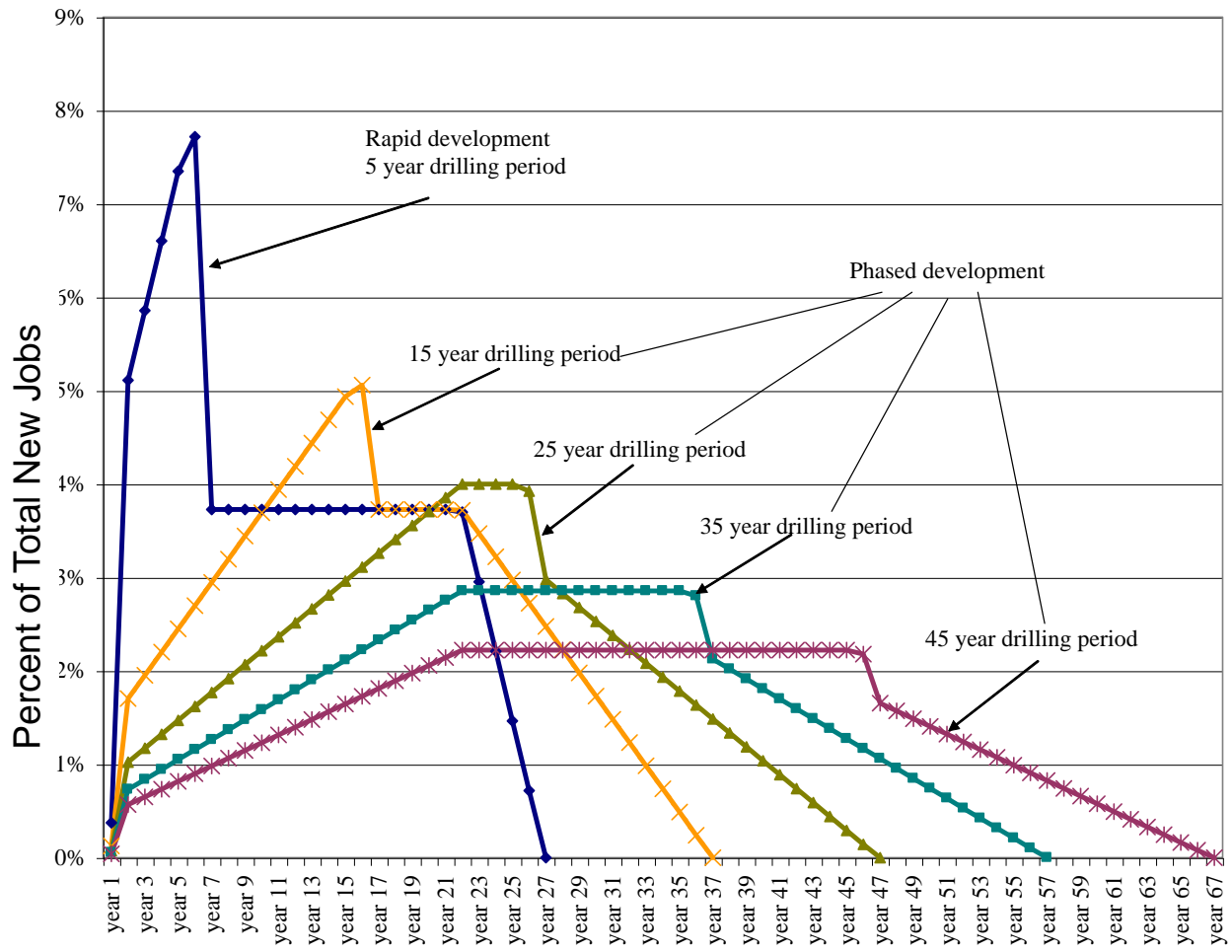


Figure 4. Estimated Annual Percentage of Total New Employment Under Five Development Timing Scenarios

Source: Haefele, M. and P. Morton. 2009. The Influence of the Pace and Scale of Energy Development on Communities: Lessons from the Natural Gas Drilling Boom in the Rocky Mountains. Western Economic Forum, Winter 2009.

# Precautionary Principle = ( try to ) do no harm

- Protecting the environment becomes a goal not a constraint on development
- Establish current “**baseline level of harm**”
  - Scientific adequacy of baseline data
  - Past scale and pace of drilling
  - Examine integrity of current wells
  - Closure and reclamation progress for abandoned and orphaned wells
  - Adequacy of bonding for closure and reclamation
  - Adequate staff-budget for inspection, enforcement and monitoring
  - Frequency of waivers and exemptions to regulations-stipulations
  - State of scientific research
- Plausible risk take precautionary actions -- a moratorium, for example
- One benefit of an moratorium is the additional time available for a city, county or state to gather data to establish a baseline level of harm.
- Not having data does not mean there isn't any harm

## Updated Suite of Economic Instruments

- Performance bonds
- Royalty rates
- Fines and Penalties
- Impact fees
- Contingency fund
- Mitigation credits
- Carbon-Methane tax
- Severance taxes
- Market forces
  - change in consumer preferences
  - sequestration payments
  - Boulder municipal power
  - green certification

## Estimated Increased in Tax Revenue from Higher Royalty Rates for Production of Oil and Natural Gas from Federal Lands in Colorado (2012)

|                            | 16.67%       | 18.75%       | 25%                  |
|----------------------------|--------------|--------------|----------------------|
| <b>COLORADO</b>            |              |              |                      |
| Natural Gas (includes NGL) | \$29,124,580 | \$43,651,949 | \$87,303,897         |
| Oil                        | \$7,475,138  | \$11,203,744 | \$22,407,488         |
| <b>TOTAL</b>               | \$36,599,718 | \$54,855,692 | <b>\$109,711,385</b> |

Royalties are paid by companies to the government for the right to produce oil and natural gas on federal lands. About half of the collected royalties are distributed to states where the drilling took place and the remainder is deposited in the U.S. Treasury. The federal onshore royalty rate hasn't changed since the 1920s and remains at 12.5 percent of the amount or value of production

Source: Morton and Kerkvliet (2013)



# Green\$\$ Up Colorado's Oil and Gas Laws and Regulations

- Increase royalty rates to increase tax revenue
- Use revenue for applied science (data collection, monitoring, research)
- Use revenue for inspection and enforcement
- Estimate Net Revenue not Gross Revenue from oil and gas
- Eliminate state (federal) blanket bonds
- Establish site-specific bonding requirements
- Eliminate property tax credit to increase severance tax revenues
- Expand the type of disclosure data collected:
  - compliance history of each operator
  - amount and source of water used for hydraulic fracturing
  - chemical content of backflow and produced waste water
  - quantity and quality of recycled fracking water
  - volume of methane emissions
  - frequency of spills and accidents.
- Third party oversight and monitoring
- 24 hour infrared camera surveillance available on the web
- State MOU with counties that limit pace and scale of drilling
- State MOU with counties that cap number of wells
- State MOU with counties that allow moratoriums or bans
- Increase drilling setbacks to  $\frac{1}{2}$  -1 mile from schools and homes
- Require buffers around riparian areas, recreation trails, and critical habitat

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