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OF LAND POLICY

Severance Taxes

The Legal and Economic Landscape

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Ian Lange, Director, Mineral and Energy Economics, Colorado School of Mines

Introductions

Marty Hardsocg

- JD, University of Wyoming College of Law (1995)
- Associate, Hathaway, Speight & Kunz (1995-1998)
- Wyoming Attorney General's Office (1998 – 2015)
  - Deputy, Civil Division (2011 – 2015)
  - Chair, Wyoming Board of Equalization (2015-present)

Introductions

Ian Lange

Government Experience

- Lead of Commodities Futures Trading Commission's "Mineral Markets in the Energy Transition" subcommittee, 2023-2024
- Member of Colorado Governor's Revenue Estimating Advisory Committee, 2022-2026
- Senior Economist for Energy at the Council of Economic Advisors, 2019-2021
- Fellow at Department of Energy's Energy Policy and Systems Analysis, 2017
- Economist at Climate Economics Branch of the Environmental Protection Agency

Focus on energy-related severance activity

- Fossil fuels
- Minerals needed for energy transition

Overview

1. What does the US produce, and how is it used?
2. What role do severance taxes play in state revenue?
3. What do states use as the tax base?
4. Challenges in mineral valuation approach
5. What's ahead?

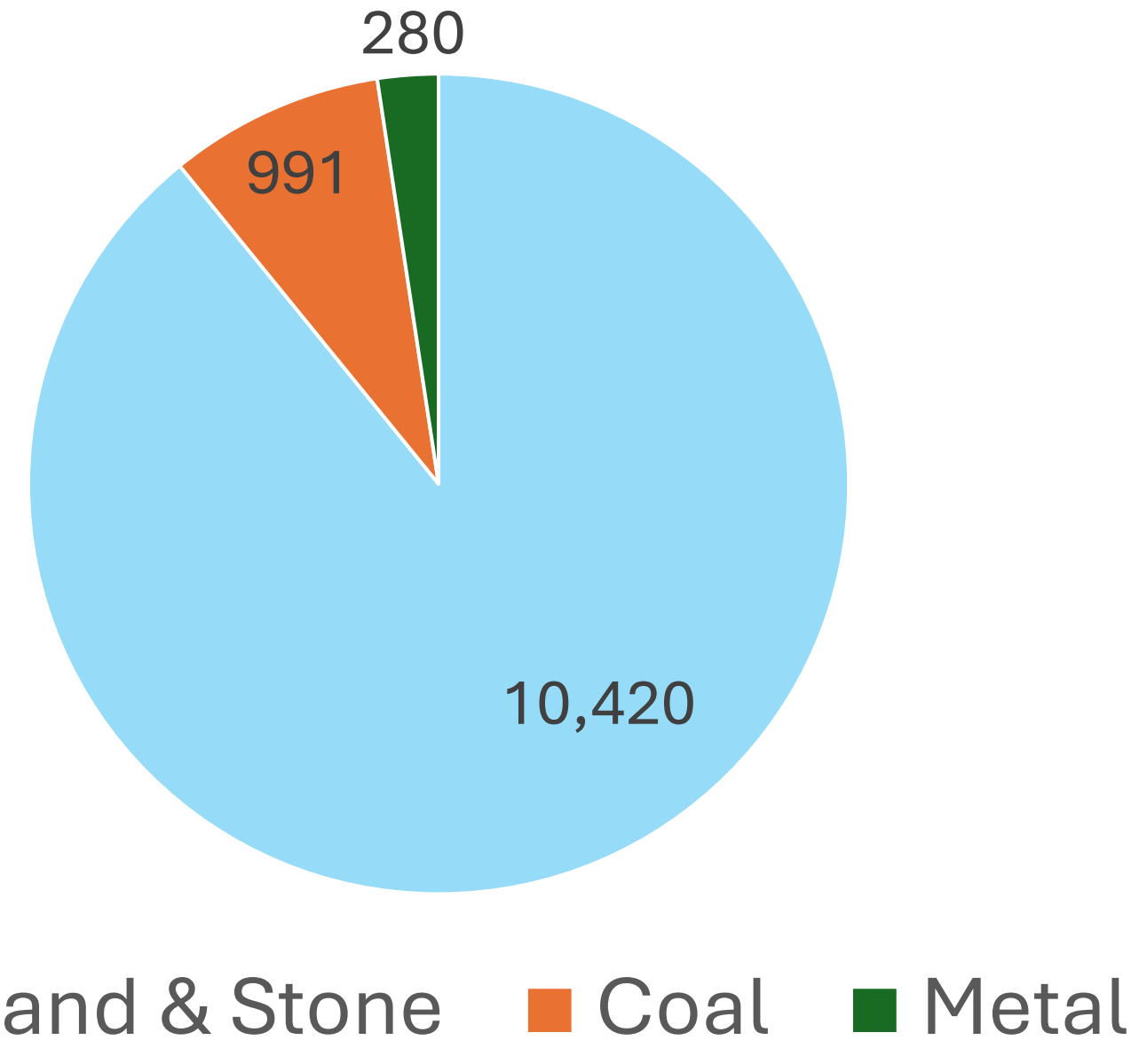
Topic 1
What does the US produce, and how is it used?

It’s a Long Way to the Top

US is the major energy producer

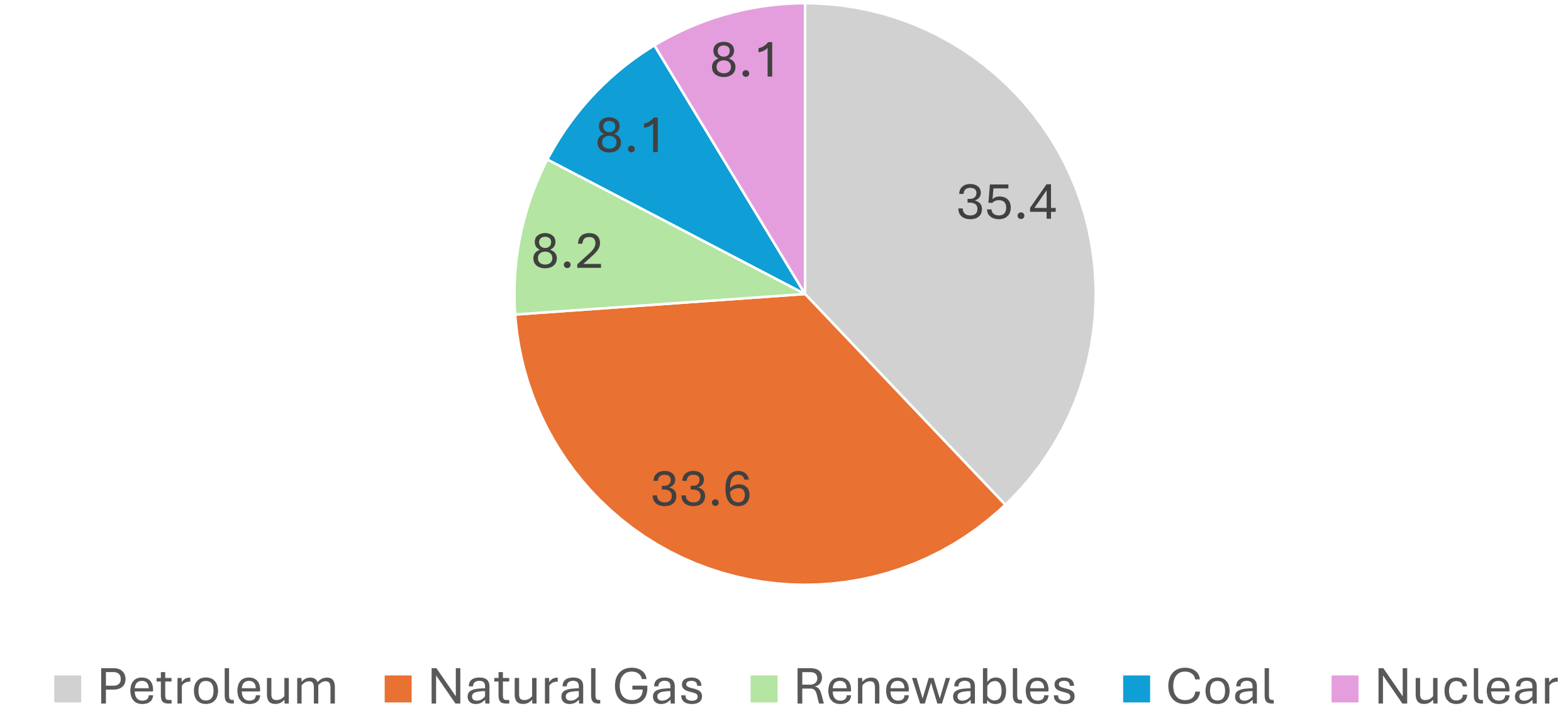
- Most oil produced
- Most gas produced
- 5th most copper producer
- 2nd most renewables producer
- 4th most coal producer

Active Mines in the US



Source: MHSA

US Energy Statistics: Primary Energy Share

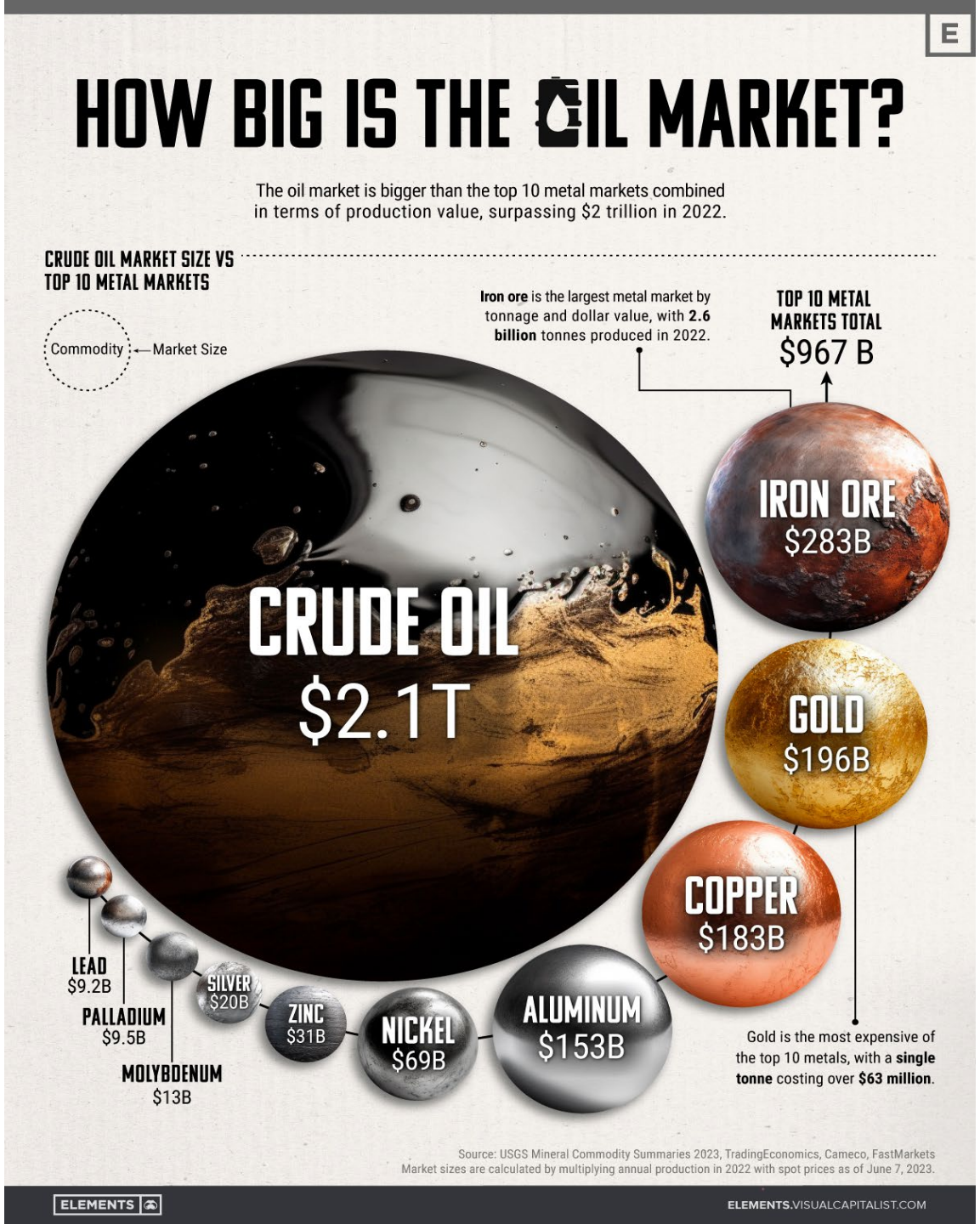


Follow the Money

- You probably have heard of the energy transition but the most value still comes from oil

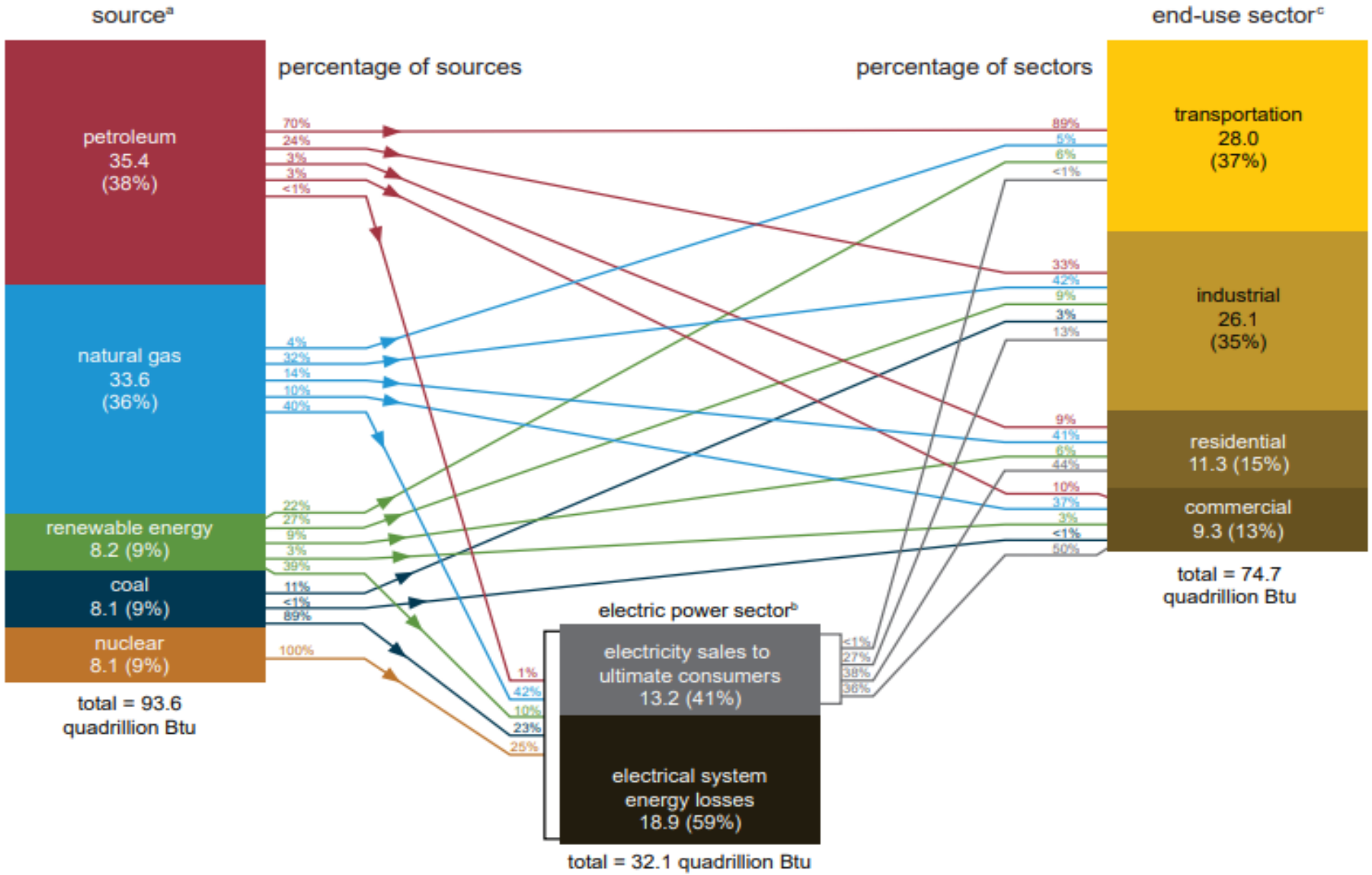
- The US produces about 13% of the World's oil, so that is more than the entire iron ore market worldwide

- So from a severance tax standpoint, oil is the most important



U.S. energy consumption by source and sector, 2023

quadrillion British thermal units (Btu)



Topic 2
What role do severance taxes play in state revenue?

Ramping up production!

1968: Wyoming's first severance tax

Mid-1970s: Severance taxes boost overall state revenues in "producing" states

1981: 8 states get 20% or more of total tax collections from energy related taxes

1982:

- 33 states have some type of severance tax
- Severance taxes contributed most to budgets in AK, TX, LA, OK, MT, WY, NM, states with most oil, gas and coal.

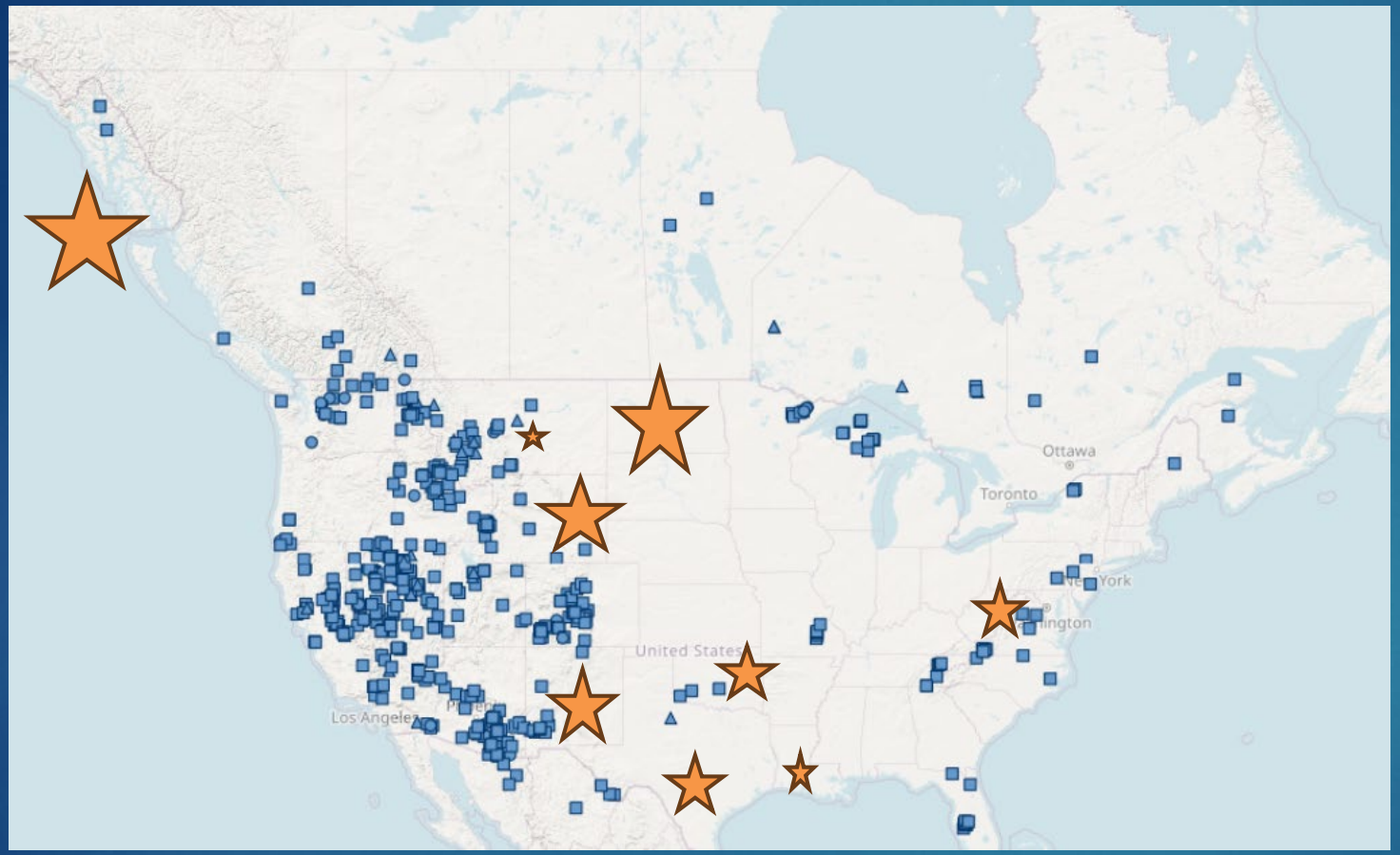
Common themes in high-mineral production states:

- Low tax burden per resident
- States generally enact heavily "exported" taxes– paid by non-resident businesses (producers) and by tourists
- May have less diversified tax base → boom and bust cycles are more prevalent, and states with smaller populations may be willing to tolerate those revenue swings–
  - the answer in Wyoming is to cut government rather than raise taxes
- No income tax: WY, TX, AK
- 8 states put part of severance revenues into reserve funds: AK, WY, MT, ND, UT, LA, WV (to weather boom-bust cycle)

Which states like severance taxes

- https://www.pewtrusts.org/en/research-and-analysis/data-visualizations/2023/how-states-raise-their-tax-dollars-fy2022

Severance taxes as major source of revenue



USGS MRDS/Pew Data

Alaska 60.9%

North Dakota 53.4%

Wyoming 31.6%

New Mexico 26.2%

Texas 13%
West Virginia 11%
Oklahoma 10%
Montana 9%
Louisiana 4%

Example: Wyoming

- 30% of revenue from severance taxes
- 40% of tax revenue from general sales taxes
- 15% from specialized sales taxes
- No personal or corporate income tax
- Taxes are heavily "exported"– paid by non-Wyoming businesses and tourists
- Boom and bust revenue cycles constantly at play
- Low population (550,000), yet tax burden per person is among the lowest in the nation (6.63% of income)
- I believe that because it is so integral to Wyoming's economy, the mineral lobby is especially formidable

Example: Alaska

- 60% of total revenues are from severance taxes
- 17% from corporate income tax
- 11% from selective sales taxes
- No personal income tax
- No statewide sales tax; local sales taxes allowed
- Low population (734,000), yet pays a "dividend" ($1,312 in 2023, to 600,000 applicants)—the ultimate tax "export"
- Tax burden 4.6% of income

Example: New Mexico

- 26% of total revenues from severance taxes on oil, gas, solid minerals and non-hydrocarbon gas, such as carbon dioxide and helium
- 48% from a broadly applied gross receipts/sales tax of 5%-9%
- 15% from individual and corporate income taxes
- Relatively low property tax burden, with "freeze" available at age 65
- Overall tax burden 8.5% of income, higher than Wyoming's or Alaska's

Example: Colorado

- 1.4% of tax revenue from severance taxes on oil, gas, coal
- 60% from personal and corporate income tax (flat 4.55% rate)
- 20% from general sales and use taxes
- Enacted a severance tax in 1977
- Revenue used primarily for water projects, natural resource-related projects, and to mitigate impacts of extraction
- Primarily a percentage of revenue approach, rather than valuation-driven, which means administration is much simpler and less adversarial
- Curious that Colorado, with comparable mineral reserves, relies far less on mineral taxation

Example: Montana

- 9% of tax collections from "natural resource taxes," including severance taxes
  - Oil, gas, coal, metals, bentonite
  - Collected at both state and local level,
  - Calculated based on gross or net proceeds
- 32% from individual and corporate income taxes
- 9% from selective sales/excise taxes
- 40% from property tax primarily at local level

And finally, Pennsylvania ???

- No severance tax despite substantial oil and gas production (Marcellus Shale)
  - ✓ Assess an "Impact fee" on producing wells
  - ✓ Based on gas price but irrespective of volume
  - ✓ Generates ≈ $200 million per year
- 42% of total tax revenue from personal and corporate income tax
- 48% from general and selective sales
- I can only imagine the political wrangling that led to legislature passing on this revenue

Observations

Lower population + Greater mineral wealth	Correlates with	Greater reliance on severance taxes Little appetite to diversify tax base, especially in conservative states (e.g. WY, AK) Strategies to cope with volatility

Strategies and Consequences

- Reserve/trust funds for down cycles
- Diversify with other "exported" taxes (tourism, other special sales taxes)
- Adjust tolerance for environmental implications?
- Tolerance for fewer public services
- Dealing with a very powerful lobby, which often has greater leverage in state politics

Topic 3
What do states use as the tax base?

"Severance tax" defined

- **Generally, an excise tax on the "privilege" of extracting natural resources**

  Example: Wyoming taxes the "privilege" of extracting minerals, based on "taxable value"

- **May be labeled as a business, license, occupation, or gross proceeds tax**

- **Variations or additional taxes are possible**
  - Example: Wyoming also imposes a "production" tax, an ad valorem tax on the taxable value of minerals produced in the prior year, "in lieu" of property tax on the land

- **Who pays: Look to the "operator" of the well or mine, but also the mineral's owner, including certain types of royalty interests**

Three main tax base models in concept

1. Tax per unit

2. Gross receipts or some revenue based approach

3. Valuation at a defined point, with deductions: tax on the "production" value or "taxable value of mineral"

1. Per-unit approach -> no valuation

- Georgia -- 3 cents per barrel of oil; 1 cent per MCF of natural gas
- New York –tiered: $3,000 for first 1 MMCF (1 million), $2,000 for 500,000 to 999,999 MCF, etc.
  - Reduces revenue volatility, but state doesn't benefit from price increases
  - simpler, less adversarial
  - Less concern with equality between producers

2. Tax based on revenues/income

- Tennessee -- 3% of sales price of oil and natural gas
- Colorado -- graduated rates based on gross revenue
- States benefit from increased prices but may give breaks or exemptions when times are tough for producers
- Nuances in defining gross receipts may blur the line, resemble value-based tax
  - States may use producer's income from a well, gross income, or "gross value" from a production source

3. Valuation at a defined point- Netback

a. Statute identifies a point in production stream where value is calculated
b. Multiply value at the defined point times tax rate

- ✓ Goal: Avoid taxing "value added" by processing, transportation, allowing those costs to be deducted
- ✓ Tax Revenues volatile when prices low and costs of processing or transportation high or variable

Models respond to fairness/uniformity considerations differently:

Picking an index or sale price, without a point of valuation and deductions, results in less "uniform" tax burdens depending on mining challenges

Same is true when taxing gross proceeds, without point of valuation and deductions

But uniformity invites complexity and extended periods during which disputes play out in court:

- Deductions based on mining science are highly technical and invite litigation given millions at stake
- Exemptions, incentives or varied tax rates add complexity and are imprecise

Topic 4
Problems in mineral valuation approach

Mineral valuation conundrum

- **Ideal**: arm's-length sale occurs precisely at defined point of valuation—but that never happens!
- **Reality**: market, transportation, or safety conditions require many steps between extraction, point of valuation and point and sale (beginning of netback calculation)
  - Coal: crushing, mixing, transportation by rail
  - Gas: if "sour," safety requires dehydration, removal of hydrogen sulfide, just to put into a FERC pipeline
  - Natural gas liquids (NGLs): separating butane, propane
  - Challenge: creating predictable, consistent system for reporting and collection

Response to the conundrum

- Taxpayers (and the state) typically "net back" from a known market price to the value at defined point
- **Premise**: the cost to produce is the mineral's taxable value; all producers should bear a similar severance tax burden
- **But:** calculating deductions, or determining whether costs are even deductible, becomes very complex and adversarial

Key terms

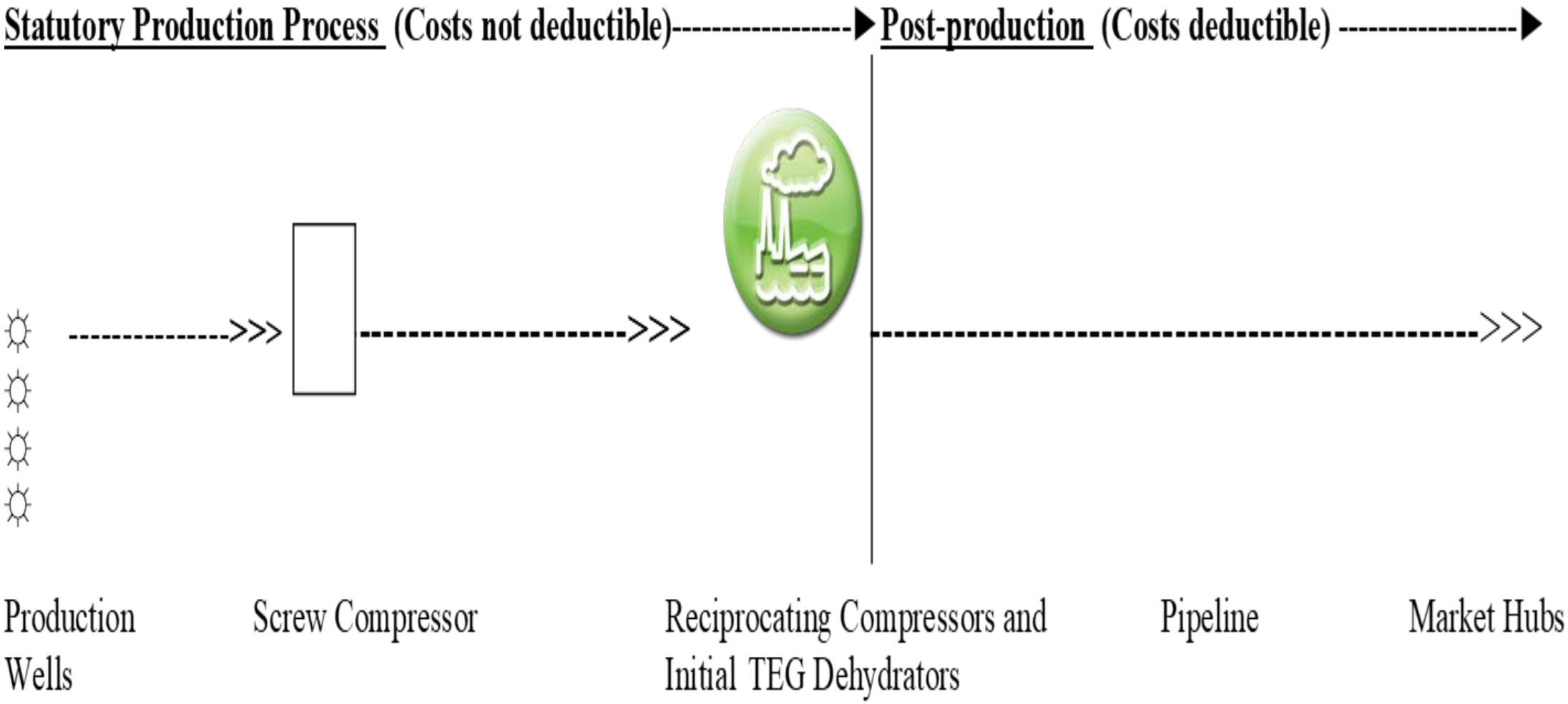
"Production" vs. "post-production": Production refers to the activities and costs to actually extract a mineral and move production downstream to a designated point. Everything (activities and costs) downstream from that point is "post production"

"Point of valuation": A designated physical point where taxable value is determined (e.g. outlet of initial TEG dehydrator for methane)

"**Netback**": Computing taxable value as:

- First arm's-length sale price, less
- Deductions for transportation and processing costs

"Netback" valuation:



Complexities of "netback" valuation

Highly technical and subject to dispute:

- **Wyoming**
  - Coal taxed at "mouth of mine" (where conveyor system leaves open pit)
  - Oil and gas taxed at specific equipment locations, e.g., first TEG dehydrator or "custody transfer meter"
- **New Mexico**
  - Value tied to published prices "at the first marketable point . . ."
    - When processed or "beneficiated" before sale, deduct processing costs between point of severance and sale

Examples: Texas and Utah

- **Utah**
  - Taxable value of oil and gas is arm's-length sale price or "comparable" sale
  - Deduct processing and transportation (up to 50% of gas value) – (Note- a failing of netback is possibility that mineral's taxable value may be "0")
- **Texas**
  - Tax imposed on "market value"
  - But market value of oil and gas = actual sale price minus costs incurred between "mouth of well" and point of sale

What happens when nothing is arm's length?

Comparable **sales**

- Many producers sell to affiliate marketing companies at non-market rates
- Sales prices may be confidential

Comparable **deductible costs**

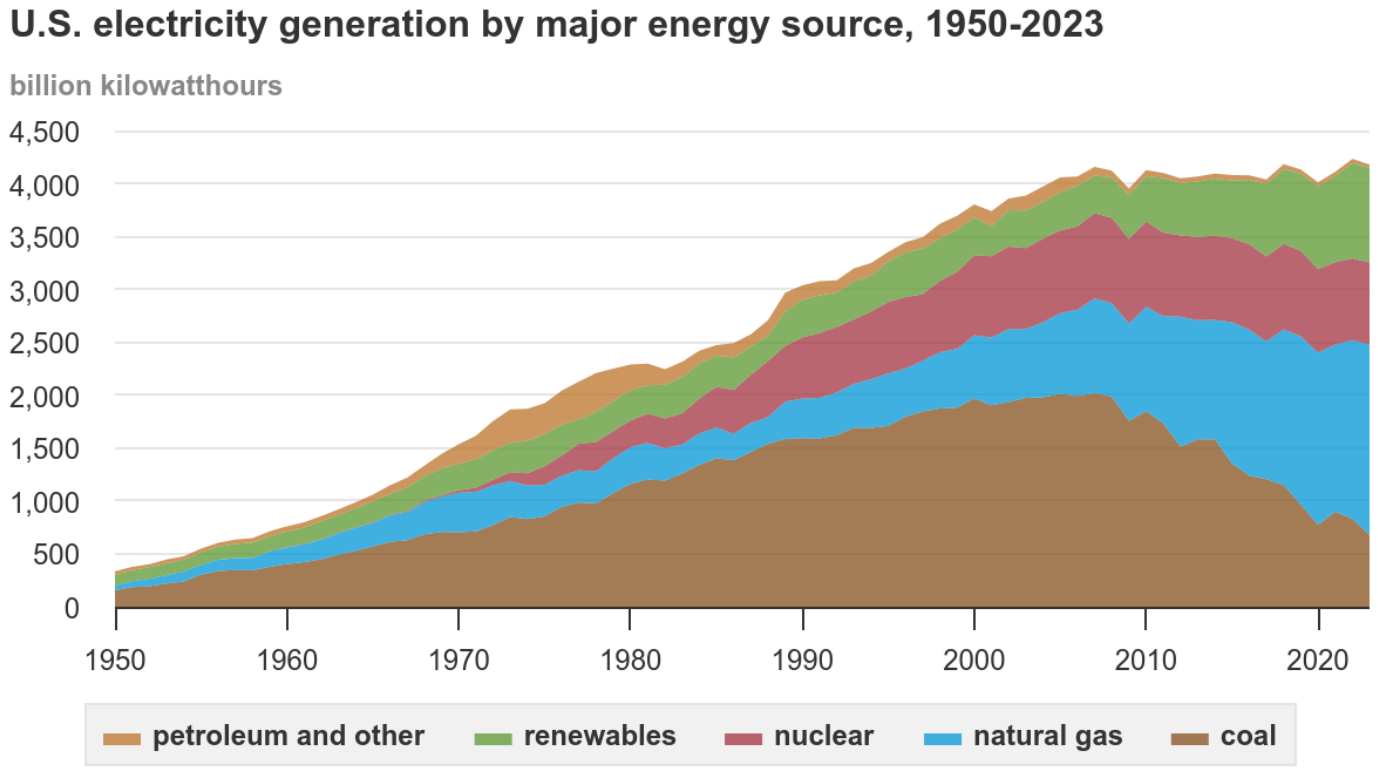
- Largest producers may be vertically integrated, owning the gathering, processing and transportation facilities; no arm's-length data available
- Scrutiny required, to ensure activities, contract terms are similar, adjustable

Deductions: deeper into the weeds

- Direct expenses vs. indirect expenses (fire prevention, incidental costs)
- Overhead (legal, environmental, housing)
- Transportation expenses to "reserve" pipeline capacity, even if not used ("firm" vs. "interruptible" transportation)
- Return on investment as a deduction?
- Allocating expenses incurred on both sides of valuation point
- Audit issues: sampling

Topic 5
What's ahead?

The Times they are-a-changing’



Data source: U.S. Energy Information Administration, *Monthly Energy Review* and *Electric Power Monthly*, February 2024, preliminary data for 2023
Note: Includes generation from power plants with at least 1 megawatt electric generation capacity.

- Coal production in a freefall
- Renewable generation increasing
- Total electricity demand growth flattening out

Once in a Lifetime

- Most clean energy technologies require a lot more minerals than their fossil fuel substitutes (International Energy Agency, World Bank, more)

- Commonly discussed minerals include:
  - Lithium (Batteries for electric vehicles and the electricity grid)
  - Nickel (Batteries for electric vehicles)
  - Copper (Moving electricity in electric vehicles or other tech)
  - Cobalt (Batteries for electric vehicles)
  - Rare Earths (Motors used in electric vehicles and offshore wind turbines)

Policy Response

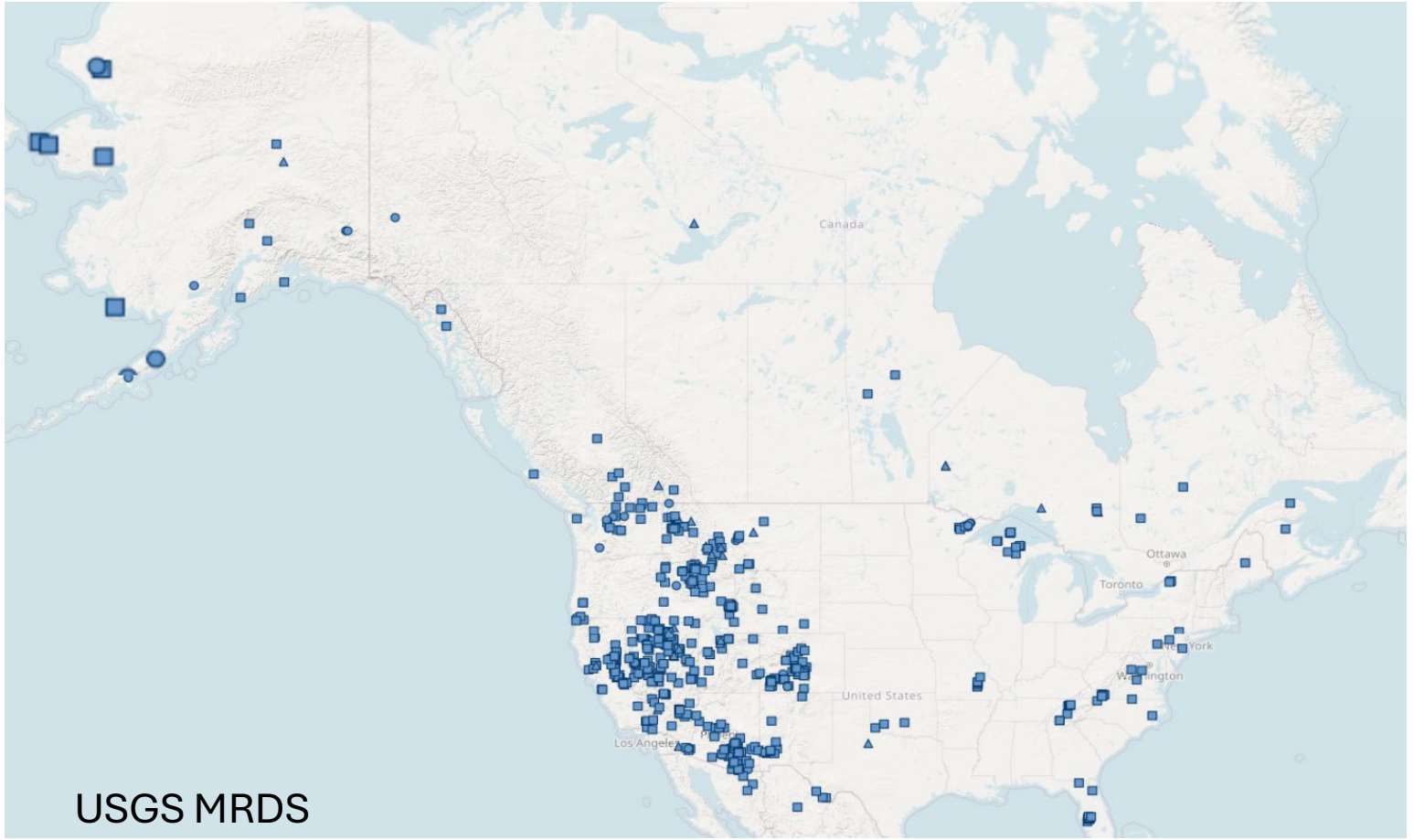
- Every OECD government making plans/goals/policies to increase domestic production of these minerals
- UK, Japan, EU, US, Canada,

- Additionally, they all have lists of critical minerals:
- UK, EU, US, Australia, Japan, Canada

Substitute

- A move to clean energy technologies will lead to less mining overall
- If severance taxes are based on quantity produced, less tax revenue
- Minerals are not consumed in the energy process
- Minerals are pretty much infinitely recyclable

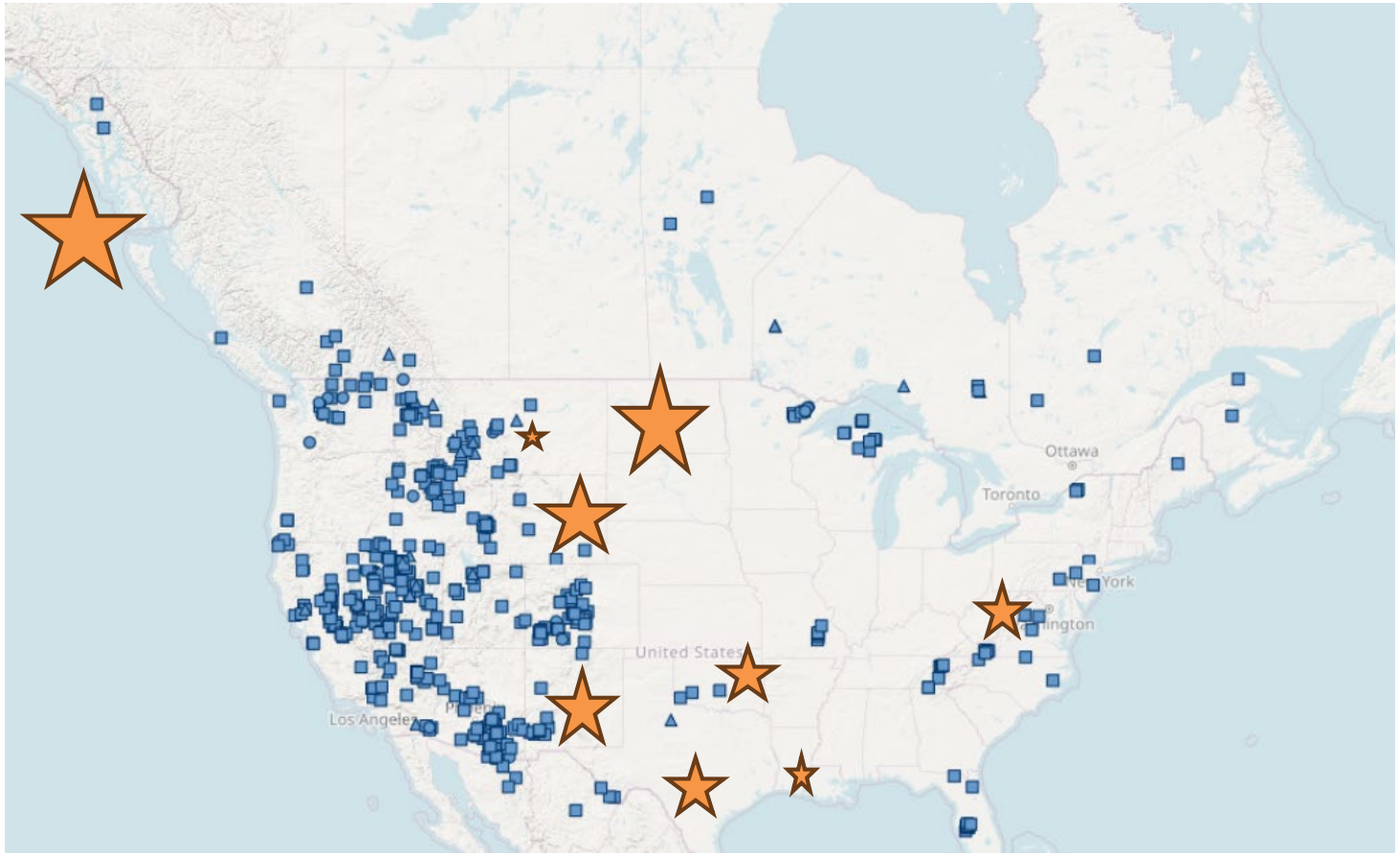
Major Mineral Deposits



USGS MRDS

- Class A Deposits according to USGS
- Well dispersed through out the US but Mountain West is the majority

Overlay: Major Severance Tax States



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What's New Pussycat?

- Lithium Brines/Produced Water
- Geologic/White Hydrogen
- Helium
- Carbon Dioxide Storage

New ways to extract minerals, confound the old valuation statutes

Let the games begin!!!

New, complex approaches to production, processing and transportation

- **Coal bed methane**: water saturated methane trickles from coal seams; must repeatedly gather and compress

- **Fracking**: Producing gas by high pressure injection of specialized fluids, rupturing hardened formation

- **CO2 flooding**: Injecting CO2 into reservoir

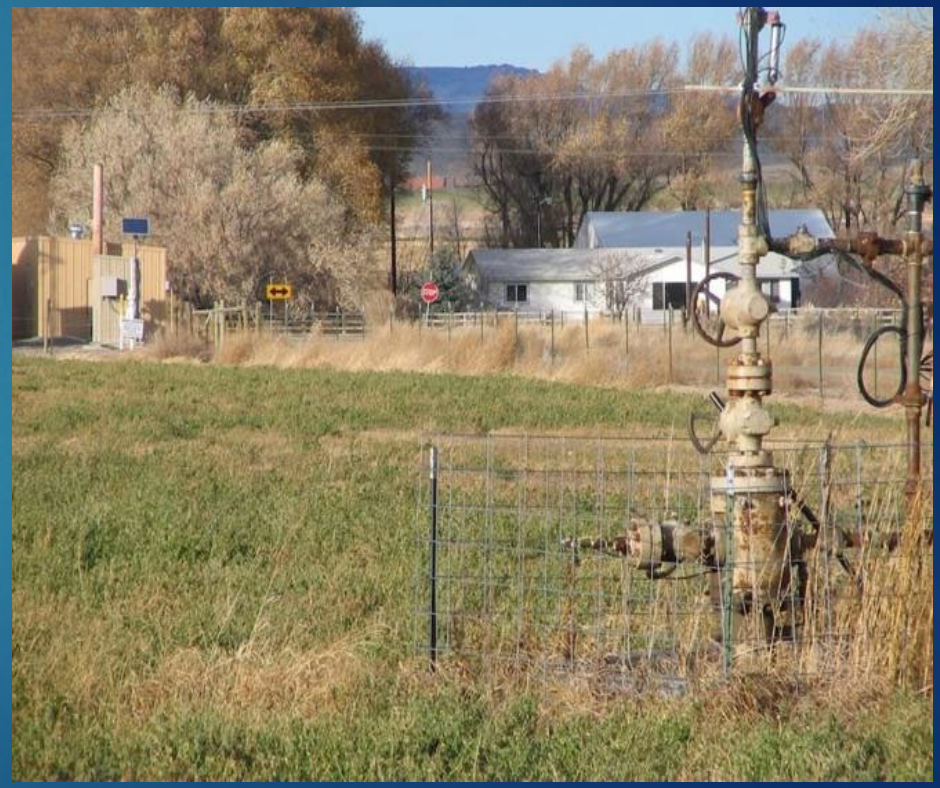
Exxon LaBarge Sour Gas—conventional, but not really . . .

Exxon produces very sour LaBarge natural gas from a very deep reservoir near the environmentally sensitive Bridger-Teton National Forest in Sublette County, WY. It is so dangerous, that Exxon was not permitted to build its Shute Creek Processing Plant at the well sites, *as would normally occur*. Gas included federal helium.

- Gas so dangerous that Exxon built redundant shut downs and flaring capabilities along pipeline, because a leak might kill everything down wind, including the Town of LaBarge, WY.
- Captures CO2 and sells for flooding
- Produces tons of sulfur, used for fertilizers

Coal bed methane – natural gas? Yes. Conventional? No. Valuation pursuant to statutes drafted 30 years before coal bed methane became prominent.

- Water-saturated natural gas trapped in coal seams.
- Extracted by pumping water from shallow wells, allowing methane to seep out of well bore at 5-6 p.s.i., saturated with water.
- Requires extensive dehydration, compression and separation to put in marketable condition.
- Lots of small, fly-by-night producers, requiring relatively small investment.
- Significant environmental impacts from water disposal challenges, and numerous abandoned "orphan" wells.
- Many litigations (between 2000-2008); tax collection actions when producers disappear.



The "Highwall Mining System" – underground coal mining?

- New technology uses a large machine to bore directly into a coal seam, rather than remove the overburden (surface mining).
- This is another instance of technology outpacing statutory framework, and predictably, a fight between producers and Wyo. Dept. of Revenue.
- In Wyoming, lower tax rate for underground mining.

Non-fossil fuel Mineral Production may require custom valuation approach

- Trona (to make glass, paper, laundry detergents, etc.)- Mined thousands of feet below earth's surface!
- Bentonite: like a clay used as an absorbent, for animal feed, drilling fluids, iron ore pelletizing, and as a sealant.
- Uranium/yellow cake (in situ): Injecting water into formation, which captures and mixes with the uranium, and is then processed to extract uranium, along with other materials
- Sand/gravel
- Decorative stone/moss rock/fossils
- Rare metals

Questions?