

Rocky Mountain West: Reading a Regional Energy System

How It Works or Fails · Rocky Mountain West · Grades 11–12 / First-Year College

Name _____ Date _____ Class _____

How to use this sheet. A ride-alongside worksheet: keep the interactive Rocky Mountain West map open beside you (MT, WY, UT, CO).

The map	Open the Rocky Mountain West Fuel Flow Map full-screen — the Interior-West energy flows across Montana, Wyoming, Utah, and Colorado.
Lens row	Sweep the views — coal, natural gas, crude, wind, hydro, uranium/nuclear, geothermal, solar, and electricity. This is the country's extraction engine.
Emissions	The button opens the emissions app — AIR QUALITY / GHG / SINKS, on EPA/EIA data. Note coal mining, the natural-gas system, wildfire (Fires), and the carbon sinks.
Vulnerability	Press VULNERABILITY and open a card.
Scenarios	The story-row buttons run a real Interior-West stress — a refinery going dark, an earthquake, a lost feed, a cold snap, a wind drought, a takeaway cut — on today's infrastructure, and each one moves an instrument in the window column.

Part 1 · The mix — the country's extraction engine

Pick ONE state to characterize (different groups take different states):

- ☐ Wyoming
- ☐ Colorado
- ☐ Montana
- ☐ Utah

1.1 Check your state in the different energy lenses or views and note what it produces or runs on. Then look at another state in the region: how is the neighbor different?

1.2 The Interior West produces far more energy than it uses — coal, gas, and wind built largely to leave the region. What does the map show is limiting that export?

1.3 Pick TWO sources of power and name what each is genuinely good at here, and note which are firm (run day and night) versus intermittent (fluctuating).

1.4 Each state generates an electricity budget, which it “spends” on consumption. On the ELECTRICITY lens, compare two states’ generation and consumption.

Part 2 · The tradeoff — what it costs and what it buys

Open the emissions app (AIR QUALITY / GHG / SINKS). The Interior West is where the country's coal is mined and gas extracted — the power other regions run on.

2.1 In GHG, compare the sectors, then open Industry and find Coal Mining inside it. Where do most of the Rockies’ emissions come from? Now drag the year slider from 2000 to today. Which sector is falling, which are rising, and what does that do to the gap between them?

2.2 Bring up the Fires source in AIR QUALITY. Which pollutants does wildfire drive hardest — and how does that compare to the power sources on a normal day?

2.3 Switch to the SINKS view. What does the region's forest do with carbon — and what does a fire year do to that?

2.4 Extra credit: on the HYDRO lens, turn on VULNERABILITY and open the Granby card. How did the 2020 East Troublesome fire hit the region's water-and-power system?

Part 3 · The weak point — a vulnerability judgment that can change

Press VULNERABILITY and open a card. A vulnerability score here is not fixed — it is a judgment about how this asset can fail, built from the evidence on the card, and it can change: a changed condition, or new research, can legitimately raise or lower it.

Pick ONE asset to read (different groups take different assets):

- Chokecherry / Sierra Madre (WY) — 3 GW of wind on one transmission line, still not spinning
- Opal Hub (WY) — the single gas-processing chokepoint much of the Rockies converges on
- Blue Mesa (CO) — drained by emergency releases to prop up Lake Powell
- Granby (CO) — one tunnel under the Divide for 1.1M+ people, closed by wildfire
- White Mesa Mill (UT) — the only operating conventional uranium mill in the country
- Wasatch Front (UT) — heat-and-power demand concentrated on an active fault

3.1 Open your asset's card and read its evidence — what it depends on, what has already happened to it, what its failure would take down. In your own words, what is this asset's real vulnerability: where and how does it fail?

3.2 A rating is a snapshot of today's conditions. Name one specific change that would make your asset MORE vulnerable and one that would make it LESS — and say why.

Part 4 · The shock — run a scenario

Each scenario runs a real Interior-West stress on today's infrastructure and moves an instrument in the window column.

Pick ONE scenario to run (different groups take different shocks):

- Commerce City Dark — Colorado's only refinery goes down in a deep freeze
- Wasatch Shake — a major earthquake on the fault the Salt Lake refinery row sits on
- Northern Feed Cut — the Bakken freezes off and Billings leans on its second feed
- Cold Snap — a deep freeze spikes heat-and-power demand against frozen gas supply
- Wind Drought — a low-wind stretch on a wind-heavy interior grid
- Takeaway Cut — the pipes out are constrained and the gas cannot leave

4.1 Run your scenario. What does it hit FIRST, and — because the region leans on so few transmission lines and reservoirs — what has no easy backup? What are the cascade (downstream or secondary) effects?

4.2 Find your scenario's supply×demand window. For COMMERCE CITY DARK and NORTHERN FEED CUT it is on the CRUDE lens under CURVES, with price and quantity. For COLD SNAP and TAKEAWAY CUT it is on the GAS lens under CURVES. WASATCH SHAKE moves both. For WIND DROUGHT it is on the WIND lens — a supply stack against a load line, reading in GW, with no price axis. Whichever you have: which curve moves, and what happens? In a few short words, what is the overall effect of this shock?

Part 5 · Judgment — defend a claim

There is no single right answer.

5.1 Use the map (the emissions app and the vulnerability cards) and current news to answer. The Interior West sits on more energy than it can use and more than it can move. Who benefits from that situation, and who pays for it?

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