

The Pacific Northwest: Reading a Regional Energy System

How It Works or Fails · The Pacific Northwest · Grades 11–12 / First-Year College

Name _____ Date _____ Class _____

How to use this sheet. A ride-alongside worksheet: keep the interactive PNW map open beside you.

The map	Open the PNW Fuel Flow Map full-screen. It covers Washington, Oregon, Idaho and the ties to Montana and BC.
Lens row	Crude, natural gas, hydro, nuclear, wind, coal, geothermal. (Notice what is not there.)
State filter	Switch the view between WA, OR and ID to isolate one state's system.
Emissions	The button top-right opens the emissions app — EPA/EIA/state data on who emits what, and what it does.
Vulnerability	Press VULNERABILITY and open a card. It carries the evidence behind the risk — what the asset depends on and what could take it down. Read it as a judgment that can move, not a fixed grade.
Scenarios	The story-row buttons run a real event type on today's infrastructure and move the supply×demand (CURVES) window.

Part 1 · The mix — what runs this region

Sweep the lens row, then use the state filter.

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

- ☐ Washington
- ☐ Oregon
- ☐ Idaho

1.1 For your state, sweep the lenses (power sources) and name the one that clearly dominates electricity here.

1.2 Now look at the crude and gas lenses and find a fuel arriving from outside the state. Where does it come from, and how does it get here?

1.3 Every source on this map earns its place with a real strength. Pick TWO lenses (energy sources) and name what each is genuinely good at — the reason a region would want it.

1.4 Hydro is nearly free to run and emits almost nothing — yet a hydro-heavy grid still keeps gas plants on hand. In a drought or a demand spike, what can gas do that hydro can't?

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

Open the emissions button (top-right) — the EPA/EIA/state app: source → pollutant → harm.

2.1 Before you open the electric-power breakout, predict from Part 1: for a hydro-dominated grid, should power-sector emissions be large or small? Then open it and read the power sources (Coal, Gas, Biomass, Oil). Did your prediction hold? Explain.

2.2 Now switch to a fine-particulate or air-toxics view (e.g. benzene / PM). Which source is the biggest here — and is it one of the power-plant sources, or something outside the grid entirely? Is it what you'd expect from a clean-power region?

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

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

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

- Colstrip (MT) — imported coal on a divestment clock
- Jim Bridger (WY) — coal converting to gas, exiting
- Par Tacoma (US Oil) — a refinery on the worst ground (Tacoma fault)
- Marathon Anacortes — a two-state loader in the Cascadia zone
- Boise / S. Idaho — one fuel corridor up from Salt Lake
- Seattle / Harbor Island — refinery-adjacent (the low-risk one)

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. Think about what the risk actually rides on: a policy or divestment decision, a coal-to-gas conversion, a seismic retrofit, a second fuel corridor or dock, a market squeeze on a thin-margin plant.

3.3 (Optional — needs outside research.) Now judge the map's rating for your asset: is it well-supported, understated, or overstated? Take a position and back it with evidence beyond the card — the status of a utility's coal-exit filing, a recent seismic or Cascadia study, a refinery's margins or closure news. A vulnerability rating is only as current as the evidence behind it.

Part 4 · The shock — run a scenario

Each scenario runs a real event TYPE on today's infrastructure.

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

- DROUGHT
- FRESHET '11
- COLD SNAP
- CSZ-WA — the full-margin Cascadia rupture (CSZ-BC and CSZ-OR run the other two segments)
- CYBER
- ENBRIDGE '18-19
- COVID '20

4.1 Run your scenario. Which lens/asset does it hit FIRST, and how does the effect jump to other energy sources? Name the cascade (downstream effects) in order.

4.2 Watch the supply×demand CURVES window as it runs. Which curve moves, and what happens to price and quantity? What is the one-line signature of your shock?

Part 5 · Judgment — defend a claim

Use evidence from at least two earlier parts. There is no single right answer — the argument is graded, not the side.

5.1 The PNW runs on falling water: cheap power, almost no power-sector carbon. Is the region's hydro dependence a regional strength or a regional vulnerability? Take a position and defend it with specific evidence from at least two parts (a mix figure, an emissions reading, a vulnerability judgment, or a scenario signature).

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