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# OREGON'S ENERGY COMPETITIVENESS INDEX

AUTHOR: STEVEN L. BYERS, PH.D.

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## ABOUT THE AUTHOR



**Steven L. Byers, Ph.D.** is the Common Sense Institute Chief Economist.

## ABOUT COMMON SENSE INSTITUTE

**Common Sense Institute** is a non-partisan research organization dedicated to the protection and promotion of Oregon's economy. CSI is at the forefront of important discussions concerning the future of free enterprise and aims to have an impact on the issues that matter most to Oregonians. CSI's mission is to examine the fiscal impacts of policies, initiatives, and proposed laws so that Oregonians are educated and informed on issues impacting their lives. CSI employs rigorous research techniques and dynamic modeling to evaluate the potential impact of these measures on the economy and individual opportunity.

## TEAMS & FELLOWS STATEMENT

CSI is committed to independent, in-depth research that examines the impacts of policies, initiatives, and proposed laws so that Oregonians are educated and informed on issues impacting their lives. CSI's commitment to institutional independence is rooted in the individual independence of our researchers, economists, and fellows. At the core of CSI's mission is a belief in the power of the free enterprise system. Our work explores ideas that protect and promote jobs and the economy, and the CSI team and fellows take part in this pursuit with academic freedom. Our team's work is informed by data-driven research and evidence. The views and opinions of fellows do not reflect the institutional views of CSI. CSI operates independently of any political party and does not take positions.

# INTRODUCTION

Aside from its reliance on the coastal refinery network, Oregon has traditionally had access to relatively affordable and reliable energy sources. In particular, Oregon's access to hydropower leads to a much different mix of electricity generation than in other states, where renewable sources provide most of its power. Oregon produces more electricity than it consumes, with exports providing a buffer for local supply. Notably, Oregon exports 57% of its volatile wind power.

Despite its historical advantages, energy costs are rising quickly in Oregon and stand to continue to do so going forward. Oregon's largest electricity provider is raising retail rates by 17% this year, with another increase of 7% slated for 2025.

Aggressive public policies aiming to reduce carbon emissions are in place for electricity, direct use fuels, and transportation fuels. All these programs are slated to ramp up in the near term, with the potential to raise costs significantly.

For electricity, Oregon's Clean Energy Plan is underway, with producers now submitting their compliance strategies. In 2021 Oregon State Legislature passed the [Clean Energy Targets bill](#).<sup>i</sup> This bill requires Portland General Electric, PacifiCorp and Electricity Service Suppliers to reduce greenhouse gas emissions from the electricity they provide. The bill also created targets for these companies to reduce the greenhouse gas emissions from electricity sold in Oregon to:

- 80 percent below baseline emissions levels by 2030.
- 90 percent below baseline emissions levels by 2035; and
- 100 percent below baseline emissions levels by 2040

Similar efforts are taking place in neighboring California. Paul Patterson, a utility analyst for Glenrock Associates LLC., stated that, "There is a disconnect between how some politicians talk about energy transition making electricity cheaper and the expensive reality. Politicians and policymakers are happy to order the meal, but it seems that it's the utility that is going to be sending the bill."<sup>ii</sup> In California, a state that has targeted a 100% clean energy transition by 2045, has seen utility rates under PG&E increase 127% in the last ten years.<sup>iii</sup>

For direct use and transportation fuels, restrictions built into 2020's Climate Protection Plan are slated to restart in the near term. The program was halted in recent years due to legal challenges to its administrative rules. Revised rules have now been drafted and are currently going through a public comment period. The new rules will no doubt be challenged as well, given that business interests would much prefer a market-based solution.

Transportation fuels will face further cost pressure as carbon intensity thresholds built into 2016's Clean Fuels Program are scheduled for large reductions in the coming years. In addition to a more stringent clean fuels standard, transportation funding policy will be revised in the coming legislative session, likely leading to increased gasoline taxes. Oregon's constitution requires that highway funding for light and heavy vehicles be proportional to the costs they impose on the system. Currently, heavy vehicles are paying far more than their equitable share through weight-mile taxes. Policymakers will likely include increased gasoline taxes in their efforts to rebalance the system.

Energy competitiveness is crucial to a state's ability to attract newcomers, keep existing residents, bring in new businesses, and expand those already located in the state. Transition to a clean energy environment is important, however, it must be achieved in a manner that minimizes cost and maximizes capacity and reliability.

## KEY FINDINGS

- **Oregon's Energy Competitiveness Index has declined slightly from 79 in 2011 to 77.5 in 2023.**
- **Nameplate capacity per 100,000 residents has increased 9.6 percent from 2011 to 2023.**
- **Electricity generation reliability without major event days has increased 168.6 percent as measured by minutes per interruption per unit of capacity.**
- **Electricity generation reliability with major event days has decreased 174.6 percent as measured by minutes per interruption per unit of capacity.**
- **Residential electric prices have increased 31.1 percent on average from 2011 to 2023.**
- **Commercial electric prices have increased 26.3 percent on average from 2011 to 2023.**
- **Industrial electric prices have increased 29.6 percent on average from 2011 to 2023.**
- **Residential natural gas prices have increased 26.3% on average from 2011 to 2023.**
- **Commercial natural gas prices have increased 24.3% on average from 2011 to 2023.**
- **Industrial natural gas prices have increased 14.5% on average from 2011 to 2023.**
- **The share of electricity produced by clean energy sources (nuclear, conventional hydroelectric, pumped hydroelectric, wind, and solar) has increased from 67.8% in 2011 to 78.9% in 2023.**

CSI issues a Free Enterprise Report annually. The report assesses the state's competitiveness relative to forty-nine other states and the District of Columbia and provides data and analysis on eight policy areas: education, energy, healthcare, housing, infrastructure, public safety, state budget, and taxes and fees. This report is intended to provide additional details on the state budget competitiveness not covered in the Free Enterprise Report.

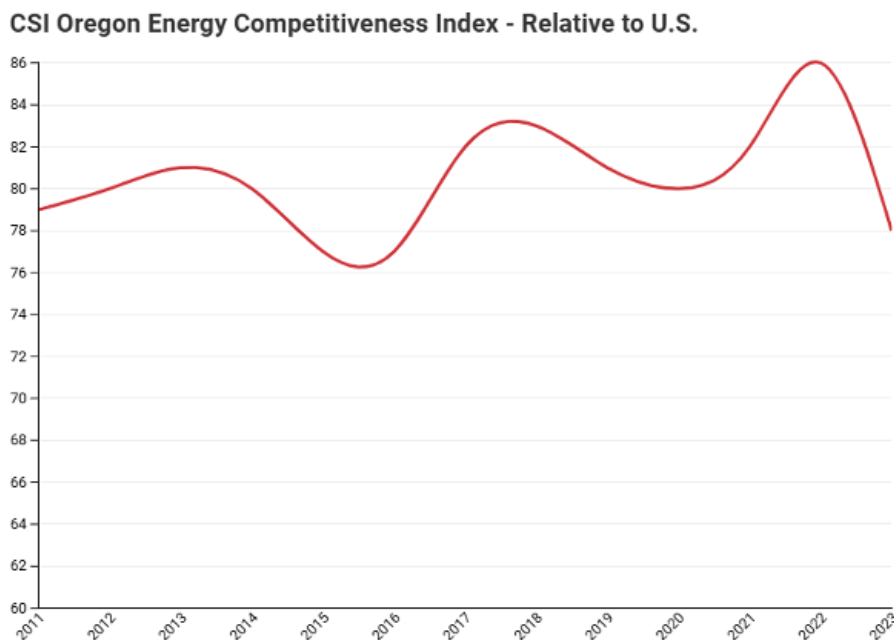
The competitiveness indices should be interpreted as follows: an increase (decrease) in an index indicates increased (decreased) competitiveness relative to the other forty-nine states and District of Columbia. Oregon's individual performance may improve, for example, its crime rate may decrease, however, other states may have seen greater decreases, and this will cause Oregon's competitiveness in the crime rate to decline.

# STATE ENERGY COMPETITIVENESS INDEX

To gauge how well states are performing regarding energy, CSI produces a State Energy Competitiveness Index for all 50 states and the District of Columbia consisting of ten metrics that capture distinct aspects of the energy sector, these include: Nameplate Capacity (Megawatts) per 100,000 Residents, Electricity Reliability – CAIDI (minutes of interruption) W/O Major Event Day (MED) per Capacity, Electricity Reliability – CAIDI (minutes of interruption) With Major Event Day (MED) per Capacity, Electricity Price (cents/kWh) – Residential, Electricity Price (cents/kWh) – Commercial, Electricity Price (cents/kWh) – Industrial, Residential Natural Gas Price, Commercial Natural Gas Price, Industrial Natural Gas Price, and Share of Electricity Produced by Clean Energy. Each metric is ranked relative to all fifty states and the District of Columbia. Then

the ten ranked metrics are equally weighted and summed. This value is ranked again to produce an aggregate measure of energy competitiveness as shown in **Figure 1**. Oregon's Energy Competitiveness Index was 79 in 2011, peaked in 2022 at 86 and then declined to 78 in 2023. An increase in the Energy Competitiveness Index is a positive qualitative change – i.e., the state is more competitive as the index approaches one hundred.

**FIGURE 1 – OREGON ENERGY COMPETITIVENESS INDEX**



**Figure 2** shows the evolution of the ten components included in the Energy Competitiveness Index.

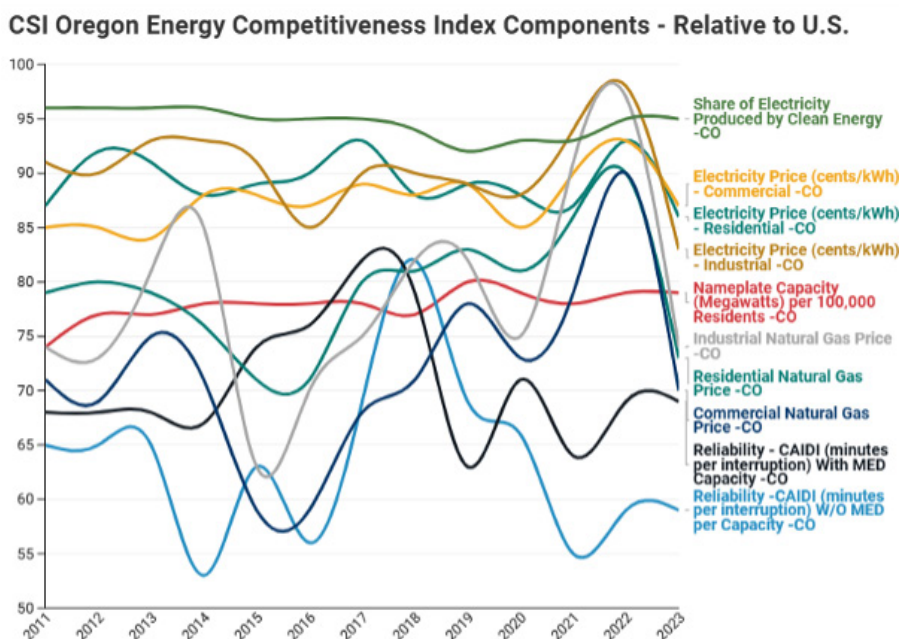
The stability in the Energy Competitiveness Index from 2011 through 2023 was the result of declines in six of the component competitiveness indices and increases in three, and Industrial Natural Gas Price was unchanged. Declines occurred in the following Component Indices:

- Electricity Reliability – CAIDI (minutes per interruption without Major Event Day (MED) per capacity), 65 to 59
- Residential Electricity Price (cents per kWh), 87 to 86
- Industrial Electricity Price (cents per kWh), 91 to 83
- Residential Natural Gas Price, 79 to 73
- Commercial Natural Gas Price, 71 to 70
- Share of Electricity Produced by Clean Energy, 96 to 95

Increases occurred in the following Component Indices:

- Nameplate Capacity (Megawatts per 100,000 Residents), 74 to 79
- Electricity Reliability – CAIDI (minutes per interruption with Major Event Day (MED) per capacity), 68 to 69
- Commercial Electricity Price (cents per kWh), 85 to 87

**FIGURE 2 - OREGON ENERGY COMPETITIVENESS INDEX COMPONENTS**





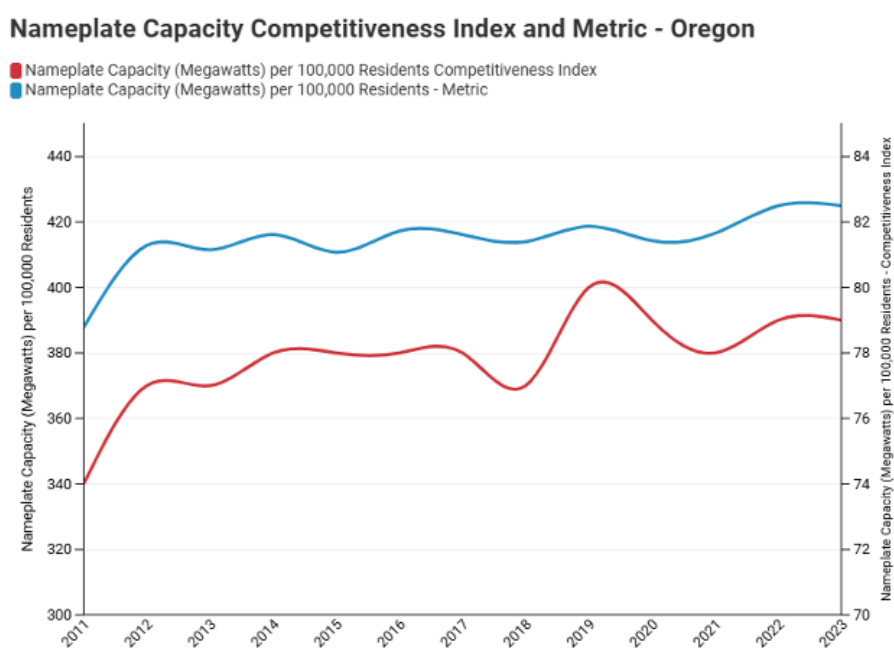
# NAMEPLATE CAPACITY (MEGAWATTS PER 100,00 RESIDENTS) COMPETITIVENESS INDEX AND METRIC

Nameplate capacity is the maximum amount of electricity that can be generated without exceeding design thermal limits and is typically expressed in megawatts (MW).<sup>iv</sup> CSI divides the nameplate capacity for a state by the state's population times 100,000 to get nameplate capacity per 100,000 residents. In doing so a comparison across states can be performed. The higher the nameplate capacity per 100,000 residents the more competitive a state is.

To determine if Oregon's change in competitiveness for nameplate capacity was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 3**.

The index rose from 74 in 2011 to 79 in 2023. This was primarily the result of increased nameplate capacity per 100,000 residents increasing from 387.77 in 2011 to 424.95 in 2023, which was a larger increase than in many other states, causing the index to rise.

**FIGURE 3 – NAMEPLATE CAPACITY COMPETITIVENESS INDEX AND METRIC**



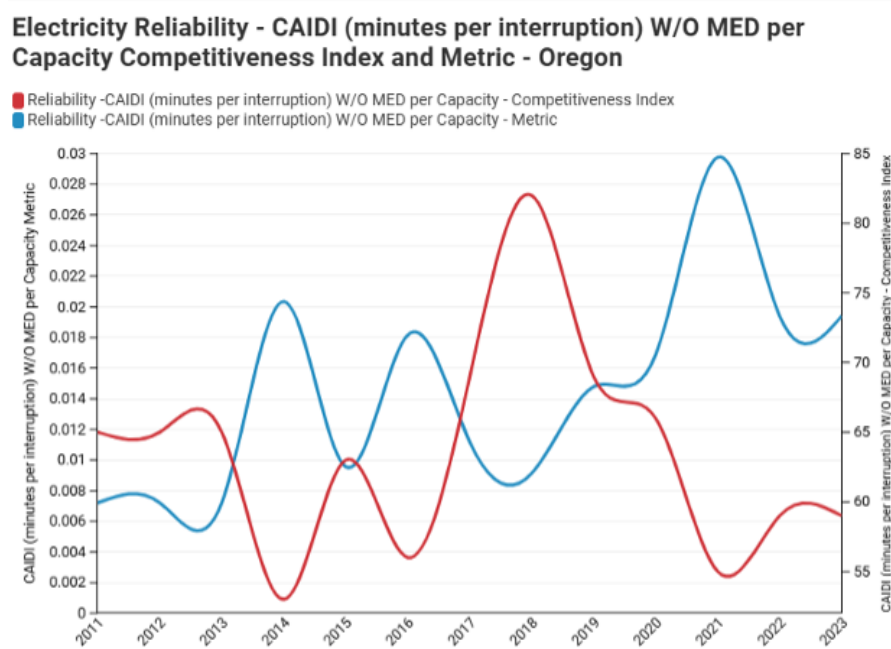
# ELECTRICITY RELIABILITY – CAIDI (MINUTES PER INTERRUPTION W/O MED PER CAPACITY) COMPETITIVENESS INDEX AND METRIC

Electricity system reliability is a measure of the ability of the electrical system to continue to deliver electricity continuously. CIS uses CAIDI without Major Event Days (MED) which is defined as the Customer Average Interruption Duration Index. This is the number of minutes it takes to restore non-momentary electric interruptions when there are no catastrophic events that exceed reasonable design or operational limits of an electric power system.

To determine if Oregon’s change in competitiveness for electricity reliability without major event days was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 4**.

The index began and ended at 65 in 2011 and declined to 59 in 2023 with a lot of volatility in the years between. The decline was primarily the result of an increase from 0.007 minutes per 100,000 residents in 2011 to 0.019 minutes per 100,000 residents in 2023. Because of this increase in minutes of interruption per capacity, Oregon’s performance relative to other states and the District of Columbia declined.

**FIGURE 4 - ELECTRICITY RELIABILITY CAIDI W/O INTERRUPTION COMPETITIVENESS INDEX AND METRIC**



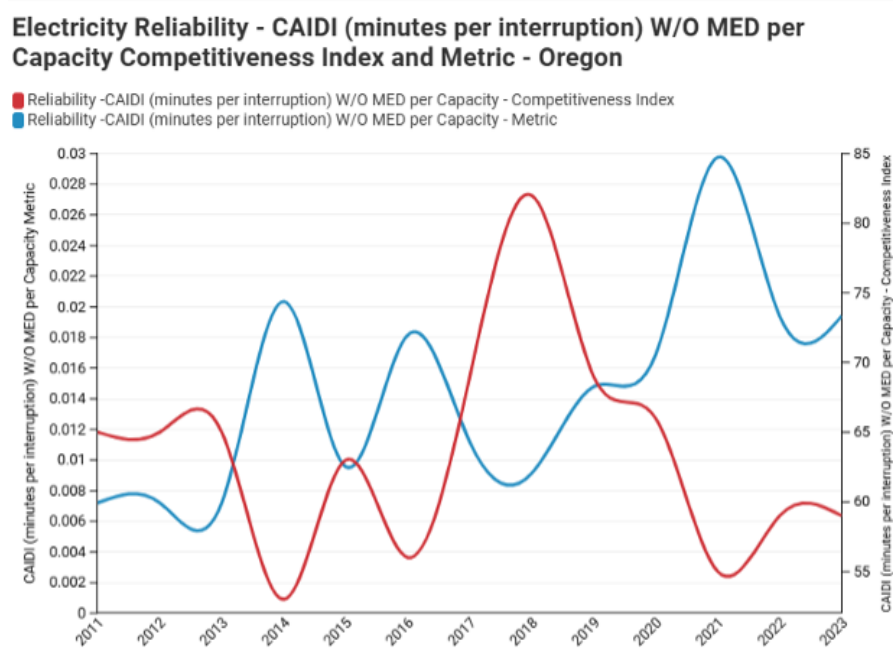
# ELECTRICITY RELIABILITY – CAIDI (MINUTES PER INTERRUPTION WITH MED PER CAPACITY) COMPETITIVENESS INDEX AND METRIC

Electricity system reliability is a measure of the ability of the electrical system to continue to deliver electricity continuously. CIS uses CAIDI with Major Event Days (MED) which is defined as the Customer Average Interruption Duration Index. This is the number of minutes it takes to restore non-momentary electric interruptions when there are catastrophic events that exceed reasonable design or operational limits of an electric power system.

To determine if Oregon's change in competitiveness for electricity reliability with major event days was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 5**.

The index increased slightly from 68 in 2011 to 69 in 2023 despite the increase in the number of minutes of interruption per 100,000 residents rising from 0.005 minutes per 100,000 residents in 2011 to 0.013 minutes per 100,000 residents in 2023. Reliability in other states suffered larger decreases in reliability, and the result is a slight improvement in Oregon's electricity reliability competitiveness relative to other states and the District of Columbia.

**FIGURE 5 – ELECTRICITY RELIABILITY (CAIDI WITH MED) COMPETITIVENESS INDEX AND METRIC**

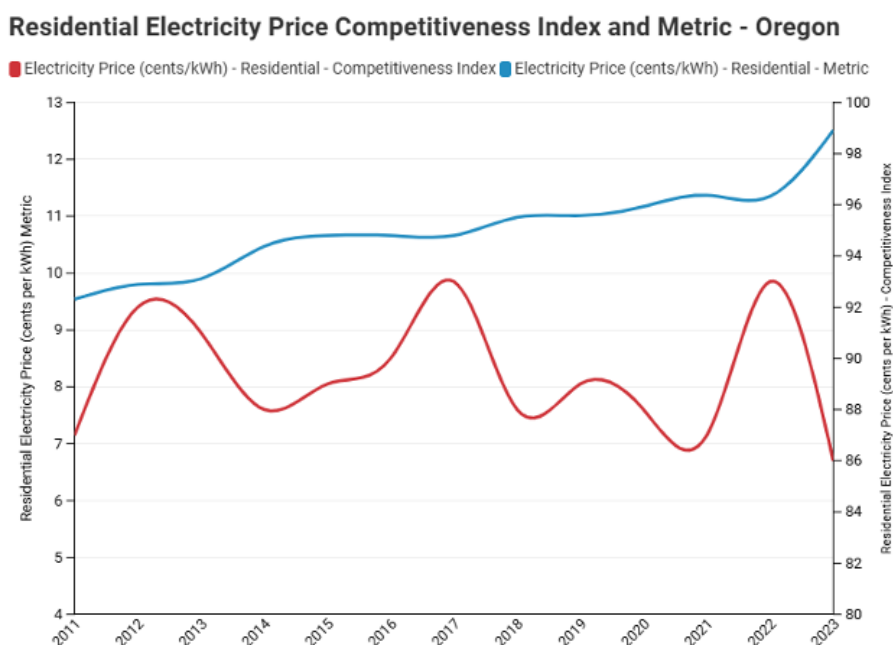


# RESIDENTIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC

To determine if Oregon's change in competitiveness in the price of residential electricity was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 6**.

The index decreased from 87 in 2011 to 86 in 2023 despite the increase in the average price of residential electricity increasing from 9.54 cents per kilowatt hour in 2011 to 12.51 cents per kilowatt hour in 2023. Despite the increase in price, relative to some other states it was smaller, and the result is a slight decline in Oregon's residential electricity price competitiveness relative to other states and the District of Columbia.

**FIGURE 6 - RESIDENTIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC**

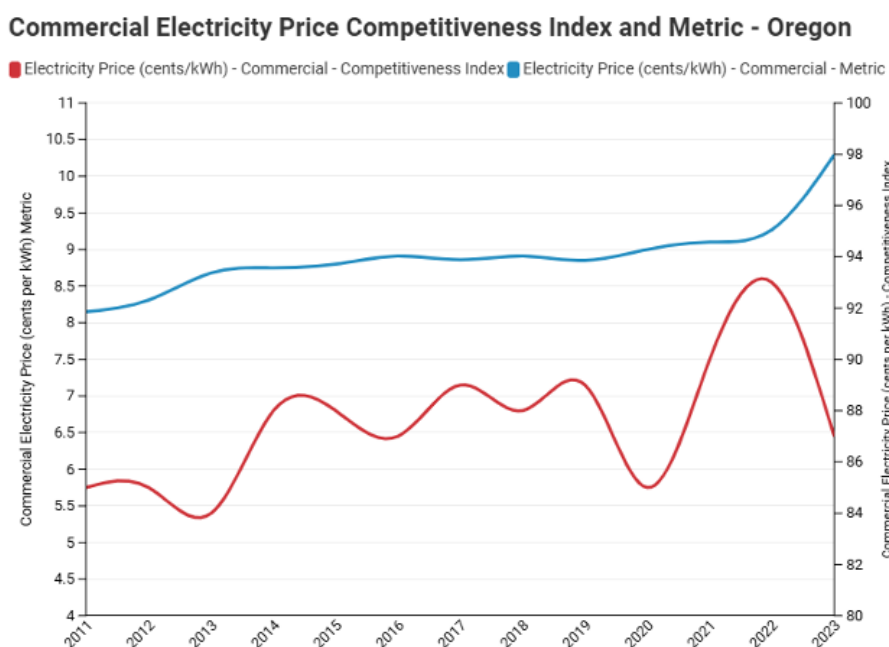


# COMMERCIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC

To determine if Oregon's change in competitiveness in the price of commercial electricity was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 7**.

The index increased from 85 in 2011 to 87 in 2023 despite the increase in the average price of commercial electricity increasing from 8.15 cents per kilowatt hour in 2011 to 10.29 cents per kilowatt hour in 2023. Despite the increase in price, relative to some other states it was smaller, and the result is an improvement in Oregon's commercial electricity price competitiveness relative to other states and the District of Columbia.

**FIGURE 7 - COMMERCIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC**

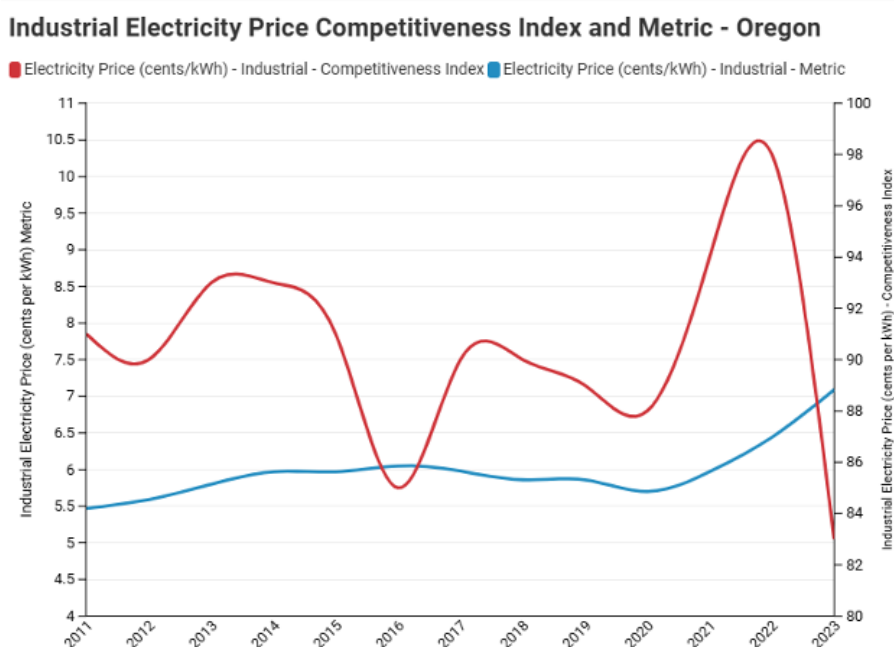


# INDUSTRIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC

To determine if Oregon's change in competitiveness in the price of commercial electricity was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 8**.

The index decreased from 91 in 2011 to 83 in 2023 as the average price of industrial electricity increased 29.6% from 5.47 cents per kilowatt hour in 2011 to 7.09 cents per kilowatt hour in 2023. Because of the increase in price, relative to some other states it was significantly larger, and the result is a deterioration in Oregon's industrial electricity price competitiveness relative to other states and the District of Columbia.

**FIGURE 8 - INDUSTRIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC**



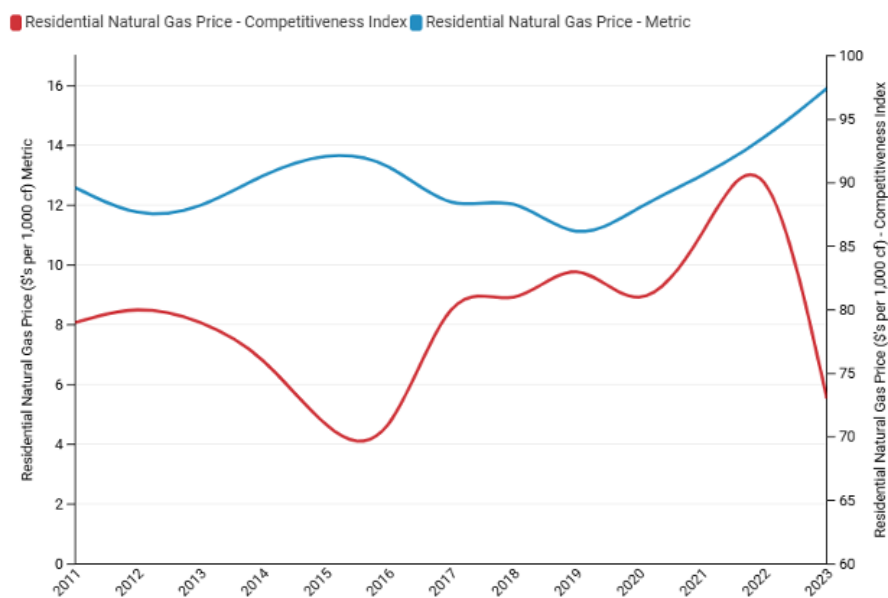
# RESIDENTIAL NATURAL GAS PRICE (\$'S PER 1,000 CUBIC FEET)

To determine if Oregon's change in competitiveness in the price of residential natural gas was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 9**.

The index decreased from 79 in 2011 to 73 in 2023 as the result of a 26.3 percent increase in the average price of residential natural gas from \$12.60 per 1,000 cubic feet in 2011 to \$15.91 per 1,000 cubic feet in 2023. As a result of the increase in price, relative to some other states it was large enough to reduce Oregon's residential natural gas competitiveness relative to other states and the District of Columbia.

**FIGURE 9 – RESIDENTIAL NATURAL GAS PRICE (\$'S PER 1,000 CUBIC FEET) COMPETITIVENESS INDEX AND METRIC**

### Residential Natural Gas Price Competitiveness Index and Metric - Oregon



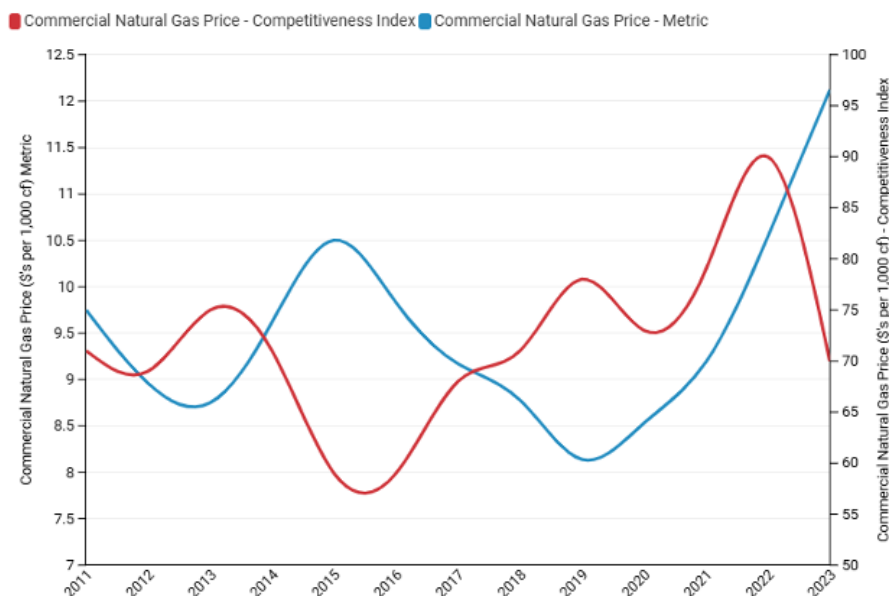
# COMMERCIAL GAS PRICE (\$'S PER 1,000 CUBIC FEET)

To determine if Oregon's change in competitiveness in the price of commercial natural gas was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 10**.

The index decreased from 70 in 2011 to 71 in 2023 as the result of a 24.3 percent increase in the average price of commercial natural gas from \$9.75 per 1,000 cubic feet in 2011 to \$12.12 per 1,000 cubic feet in 2023. As a result of the increase in price, relative to some other states it was large enough to reduce Oregon's commercial natural gas competitiveness relative to other states and the District of Columbia.

**FIGURE 10 – COMMERCIAL NATURAL GAS PRICE (\$'S PER 1,000 CUBIC FEET) COMPETITIVENESS INDEX AND METRIC**

### Commercial Natural Gas Price Competitiveness Index and Metric - Oregon



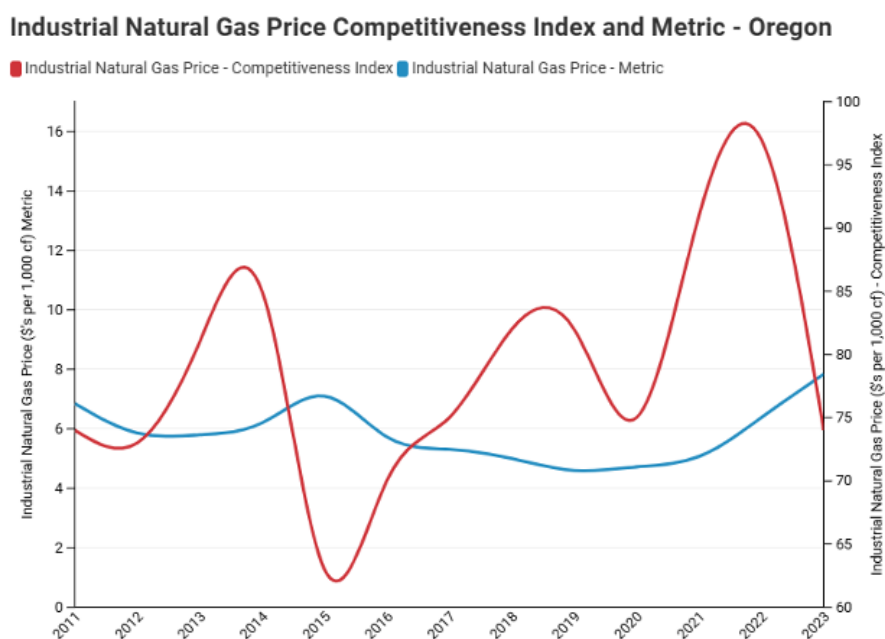


# INDUSTRIAL GAS PRICE (\$'S PER 1,000 CUBIC FEET)

To determine if Oregon's change in competitiveness in the price of industrial natural gas was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 11**.

The index was unchanged from 74 in 2011 to 74 in 2023 despite a 26.5 percent increase in the average price of industrial natural gas from \$6.85 per 1,000 cubic feet in 2011 to \$7.84 per 1,000 cubic feet in 2023. Despite the increase in price, relative to some other states it was not large enough to reduce Oregon's industrial natural gas competitiveness relative to other states and the District of Columbia.

**FIGURE 11 - INDUSTRIAL NATURAL GAS PRICE (\$'S PER 1,000 CUBIC FEET) COMPETITIVENESS INDEX AND METRIC**



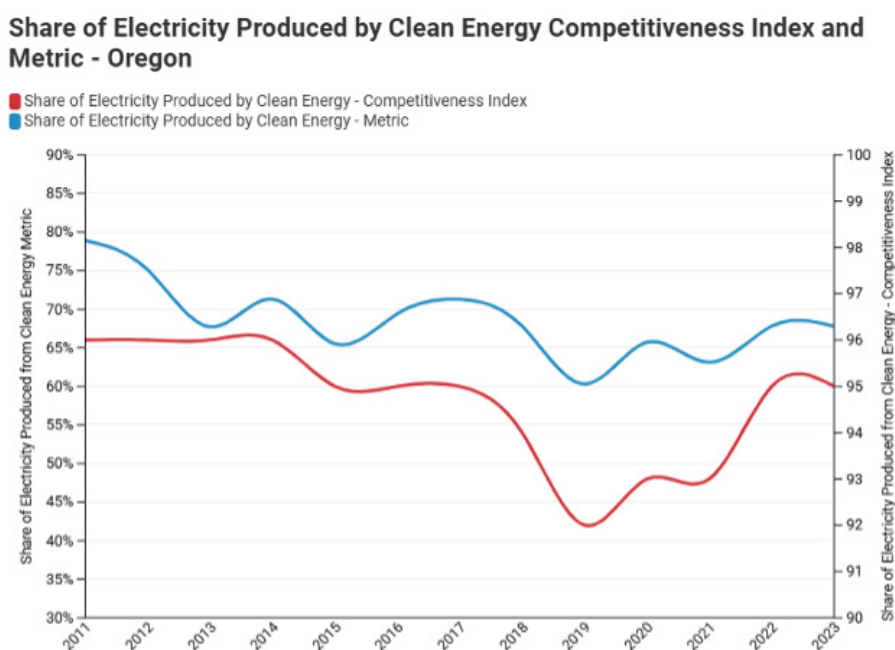
# SHARE OF ELECTRICITY PRODUCED BY CLEAN ENERGY

The proverbial horse is out of the barn when it comes to the share of electricity produced by clean energy sources. Federal and state mandates and regulations are forcing states to reduce electricity generation from traditional energy sources like coal and natural gas to a portfolio containing wind, solar, hydroelectric, nuclear, and geothermal, among others. The clean energy sources CSI uses in this index are nuclear, conventional hydroelectric, pumped hydroelectric, wind, and solar.

To determine if Oregon's change in competitiveness in the share of electricity produced from clean energy sources was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 12**.

The index decreased from 96 in 2011 to 95 in 2023 as the result of the share of electricity produced from clean energy increasing from 78.9% in 2011 to 67.8% in 2023. Despite the decline, relative to some other states it was not large enough to dramatically change (in 2011 it was 96, in 2023 it was 95) Oregon's electricity generation from clean energy sources competitiveness relative to other states and the District of Columbia.

**FIGURE 12 – SHARE OF ELECTRICITY PRODUCED BY CLEAN ENERGY COMPETITIVENESS INDEX AND METRIC**



## GOING FORWARD

In recent years, Oregon has enacted aggressive climate policies across all energy types. These policies are not well coordinated, with few meaningful cost controls included. The momentum in the state and nationally for further climate friendly energy policy is strong and increasing. Despite numerous proclamations from government bureaucrats, politicians, and utilities that electricity prices would decline with no loss of capacity or reliability, residential electricity prices rose 31.1% on average from 2011 to 2023, commercial electricity prices rose on average 26.3%, and industrial electricity prices rose on average 29.6%. At the same time, electricity reliability has declined with more minutes of interruption per generation capacity.

In the name of reducing greenhouse gases, the usual suspects have been attacking the oil and gas sector in Oregon and not surprisingly, from 2011 to 2023 residential natural gas prices have risen on average 26.3%, commercial natural gas price rose on average 24.3%, and industrial natural gas increased on average 14.5%.

Energy competitiveness is crucial for Oregon's economic future. Based on CSI's Energy Competitiveness Index, the state has declined slightly since 2011, however, Oregon's rank relative to 49 other states and the District of Columbia has fallen from 16th to 19th.

The transition to clean energy production will continue assuredly. Without sensible goals and time frames for achieving them, Oregon's energy competitiveness is likely to continue to decline, increasing the cost of doing business and further burdening residents. The net result will be a decline in Oregon's attractiveness relative to other states.

# Endnotes

- i. <https://www.oregon.gov/deq/ghgp/pages/clean-energy-targets.aspx>
- ii. <https://www.bloomberg.com/news/articles/2024-02-26/green-goals-clash-with-higher-power-bills-exelon-ceo-says>
- iii. [https://www.wsj.com/science/environment/green-energy-taxes-governments-consumers-7439400d?mod=Searchresults\\_pos7&page=1](https://www.wsj.com/science/environment/green-energy-taxes-governments-consumers-7439400d?mod=Searchresults_pos7&page=1)
- iv. [https://www.eia.gov/tools/glossary/index.php?id=G#gen\\_nameplate](https://www.eia.gov/tools/glossary/index.php?id=G#gen_nameplate)