

NUCE_2122_HW2

Dane Sabo NUCE 2122 - Summer 2025

Instructions:

Read and analyze the internet details associated with Constellation Energy and Dominion Energy. They are the two most significant companies in the US.

For each company prepare the following analysis: - What are their main businesses/ separate companies - What is the total installed generation in MWE owned or operated by each company - What are the types and MWE of power plants they own or operate. - Which of their plants are owned and operated as merchant plants and which are regulated - What does their strategic plan say - What are the major risks or challenges that they face in the next 10 years

Send the completed summary to chris67ta@gmail.com

Submission:

Constellation Energy

What are their main businesses and subsidiaries?

Constellation Energy is a major energy producer in the United States, with 32,400 MW of generation capacity. Constellation Energy proudly claims that they are the #1 producer of carbon-free energy in the United States, producing 10% of the nation's carbon-free capacity. Constellation Energy is an extremely large producer of nuclear power, producing more nuclear capacity than 'all other competitive generators combined', according to their 2024 investor presentation (22.1 GWs!).

Constellation's main business (pre-Calpine merger), has been located in the PJM (Pennsylvania-New Jersey-Maryland) Interconnection (69%), with most other generation occurring in the ERCOT and NYISO regions (9% total). Following their acquisition of Calpine, Constellation Energy has a more rounded service area, producing 49% of its total capacity in PJM, 23% in ERCOT, 10% in CAISO, 8% in NYISO, with a final 10% distributed in other locations.

What is the total installed generation in MWE owned or operated?

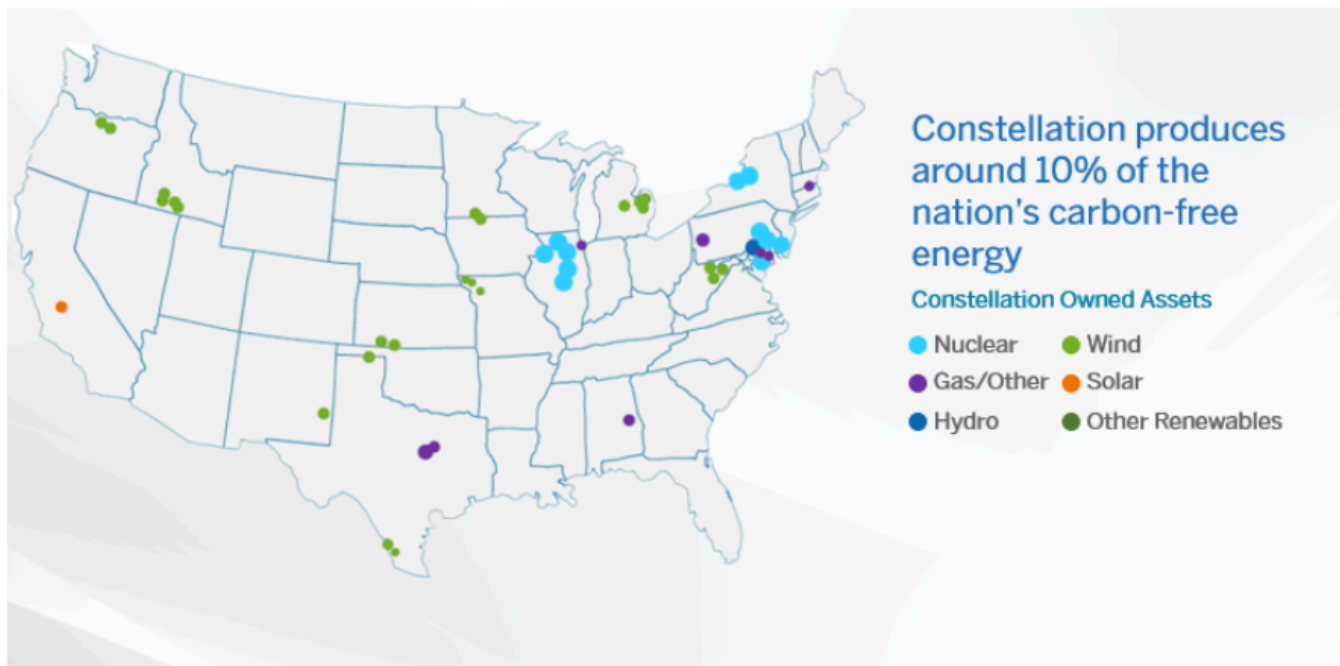
Constellation has a total of 32,400 megawatts of capacity.

What are the types and MWE of power plants they own or operate?

According to Constellations Investor website, the breakdown of their fleet is as follows:

Plant Type	Capacity (%)	Capacity (MW)
Nuclear	60	19,440
Natural Gas	20	6,480
Natural Gas and Oil	6	1,944
Hydroelectric	5	1,620
Oil	~4	1,296
Wind	~1	~324
Solar	~1	~324

Which of their plants are owned and operated as merchant plants and which are regulated?



According to the location of Constellation's generating plants, most of their plants are located in merchant areas. All of Constellation Energy's nuclear power plants are in deregulated (merchant) markets. They have several wind facilities in regulated locations, while owning one gas plant in a regulated state (Alabama).

What does their strategic plan say?

Constellation's strategic plan is to continue to build towards a carbon-free future--at least that is what it says on their website. Their actions, however, show a possibly different way forward following the acquisition of Calpine, the United States's largest power generator from natural gas

What are the major risks or challenges they face in the next 10 years?

In my opinion, Constellation's biggest risk is they do not have any current plant construction, but expect energy demand to increase dramatically. They are in a great position to capitalize on increased energy demands from the development of AI, but really only through increased prices. Most of their capacity is located in merchant markets which is great for their profitability in a high demand market, but if they want to stay focused on nuclear they have to have started building yesterday.

Dominion Energy

What are their main businesses and subsidiaries?

Dominion Energy operates its business through three main companies: Dominion Energy Virginia, Dominion Energy South Carolina, and Contracted Energy. Dominion Energy's main business is in wholesale energy, but Dominion makes a significant amount of money by doing natural gas distribution, transmission, and storage.

What is the total installed generation in MWE owned or operated?

Dominion Energy's total power generation is on the order of 27,000 MW.

What are the types and MWE of power plants they own or operate?

Plant Type	Capacity (%)	Capacity (MW)
Natural Gas	48	12,960
Nuclear	23	6,210
Coal	18	4,860
Hydro and other Renewables	11	2,970

Which of their plants are owned and operated as merchant plants and which are regulated?

Dominion Energy operates 4 nuclear power plants. Millstone is in a merchant market (CT), North Anna and Surry are *likely* in a merchant market (VA), while V.C. Summer is located in a regulated market (SC).

Dominion Energy owns several natural gas power plants, of which all but one are located in Virginia. As a result, these plants are likely merchant plants. One plant, the Rosemary power plant, is located in Roanoke Rapids, North Carolina. This plant is a regulated plant.

Dominion operates several coal power plants, all located in Virginia and likely merchant plants.

Dominion has a small number of renewable plants, which are half located in Virginia (merchant), while half are located in North Carolina and South Carolina (regulated).

What does their strategic plan say?

Dominion Energy's Integrated Resource Plan says that their primary goal is to increase energy production in their service area with an anticipation of completion of their offshore wind farm. They anticipate that energy consumption will increase in the near-term, while importing power from other providers in the PJM interconnection will become prohibitively expensive

What are the major risks or challenges they face in the next 10 years?

Dominion's biggest challenges are likely the expected scarcity of power on the PJM interconnect if generation does not greatly increase. With the AI boom looking to drastically change power consumption, those without large power projects may end up behind the ball and have to purchase power from other areas on the interconnect. This can quickly become very expensive, and with operating in some regulated areas, Dominion might have some trouble in dealing with the state to negotiate appropriate rates if there is a sharp increase in cost.