ADVANCED ENERGY ECONOMY

Transforming Policy. Expanding Markets.

WESTERN RTO ECONOMIC IMPACT STUDY

NEVADA RESULTS

Prepared for Advanced Energy Economy
by Energy Strategies, LLC, and Peterson & Associates

September 2022

Western RTO Economic Impact Study
Nevada Results
September 2022

Prepared by:
Energy Strategies, LLC
Peterson & Associates

Energy Strategies, LLC
111 East Broadway, Suite 1200
Salt Lake City, UT 84111
801-355-4365

www.energystrat.com

EXECUTIVE SUMMARY

In July 2022, Advanced Energy Economy (AEE) released the *Western Regional Transmission Organization (RTO) Economic Impact Study: Region Wide Analysis*. That report provides a summary of the methodology and assumptions used to assess the non-energy economic impacts that might accrue to the West due to the development of a broad, West-wide organized electricity market or RTO. The report, prepared by Energy Strategies and Peterson & Associates, filled a research gap on the broader economic impacts that might result from the electricity cost savings and structural changes brought about by a potential RTO in the West. The region-wide analysis summarizes the total, combined economic impacts for the 11 Western states that were evaluated as part of the study effort.

This summary document provides the high-level economic impacts expected to accrue to Nevada, specifically, from the development of a West-wide RTO. It demonstrates that operation of a West-wide RTO can bring substantial economic growth, including new jobs, new indirect business taxes, and increases to Gross State Product (GSP) to Nevada.[1] This study focused on evaluating two broad categories of economic impacts that may result to Nevada from an RTO:

1. The economic impacts to Nevada from ***increased spending power for households*** that would occur due to electricity prices being lower under an RTO than under the status quo for electricity markets in the region, and
2. The economic impacts from ***new or expanded business activity*** due to RTO development, including both:
    a. The impact of lower electricity prices for businesses, incentivizing them to expand in or locate to Nevada, and
    b. Structural changes to the electricity market enabling new renewable energy development contracts to meet corporate clean energy demand, which is currently taking place primarily in regions with RTOs.

Studying the potential impacts of an RTO resulted in a range of expected economic impacts to Nevada. This range reflects the uncertainty in how sensitive firms ultimately are to electricity prices and on how much additional clean electricity generating capacity would be built due to the new contracting structures enabled by the RTO. While the range of impacts is fairly wide, the results demonstrate that, even on the low-end, the economic benefits of an RTO to Nevada are expected to

[1] All of the caveats, considerations, assumptions, and disclaimers discussed in the *Western RTO Economic Impact Study: Region Wide Analysis* also apply to this summary document. Readers looking for more detailed information, and to understand the qualifications of this study work, should refer to that report.

be substantial. The range of economic impacts to Nevada, in the 2030 timeframe, is illustrated below in Figure 1.

In summary, the creation of a West-wide RTO is expected to:

- Result in about ***$32 million per year in electricity cost savings for Nevada*** compared to operation of the electrical grid without a west-wide RTO (after taking into account likely RTO operational costs for Nevada)[2]

- Provide between ***4,900 and 21,300*** permanent jobs across the state, with those jobs averaging total compensation (payroll plus benefits) of roughly $65,000 per year

- Generate between ***$509 million and $2.2 billion in additional GSP per year*** across the state (equivalent to 0.3% to 1.3% of Nevada's current GSP)

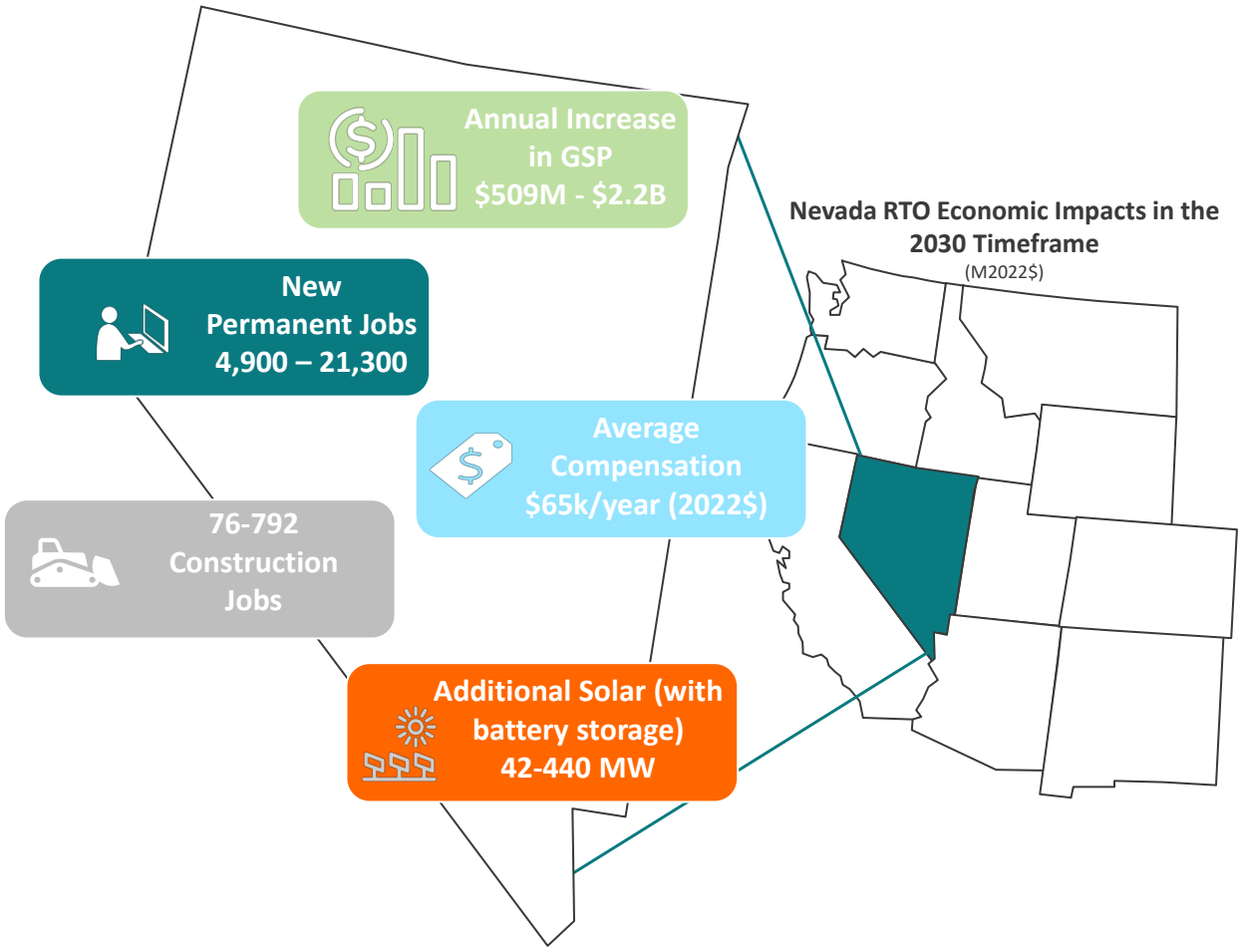
- Produce incremental state and local tax contributions ranging between ***$24 million and $104 million per year***

- Create ***76 to 792 temporary construction jobs in 2030*** from the development of additional clean energy resources to meet corporate demand, resulting in an additional ***$11 million to $110 million in GSP*** and ***$320 thousand to $3.3 million in taxes*** on a temporary basis; and

- If an RTO were to locate in Nevada, the incremental direct investments (in the form of hardware/software, office space and staffing to support the RTO's operations), ***there would be additional economic benefits to the state***, the range of which is summarized in Appendix A of the *Western RTO Economic Impact Study: Region Wide Analysis*.

[2] This calculation of electricity cost savings does not account for ***all*** potential benefits or costs of RTO formation/operation that might affect individual utilities or states. The quantified RTO benefits include only a subset of potential benefit categories and do not account for, for instance, the benefits of centralized transmission planning or enhanced reliability offered by an RTO. The RTO operational costs also do not account for all cost impacts from RTOs. For instance, utility-level investments and staffing costs that may be required to participate in an RTO are highly dependent on the specifics of a utility's situation and have not been analyzed and netted from gross benefits in this study. Additionally, transmission cost shifts that may occur due to RTO formation (eliminating the need for one utility to pay another utility to utilize their transmission system) have not been evaluated in the context of this study.

Figure 1 Summary of Range of Nevada's Non-Energy Economic Impacts Associated with RTO Formation



These benefits to the Nevada economy would be driven by lower electricity prices (in comparison to a case without an RTO) for households and businesses, additional clean energy development across the state, and expansion of existing or attraction of new businesses to Nevada, which may decide to locate or expand in the state from the competitive advantage gained from lower electricity prices. The industries that might be affected by this advantage include industries that may be crucial to the state's long-term economic strategy, including the potential to expand battery storage manufacturing and data center-type activities. The direct growth that may occur in various industries will also have indirect and induced effects (also called "multiplier" effects") as the increased direct economic activity flows through the Nevada economy.

Electricity Price Benefits Net of RTO Operational Costs for Nevada

Table 1 illustrates the assumed gross RTO benefits for Nevada,[3] the estimated RTO operational costs for Nevada, and the benefits of RTO operation net of RTO operational costs. The assumed levels of savings associated with RTO operation were a key input into this study's economic impact analysis.

Table 1 Calculation of RTO Benefits Net of Operational Costs for Nevada

Nevada (Millions 2022$)	2025	2030	2035
Gross RTO Benefits	$37	$49	$49
RTO Administrative Costs	$18	$17	$17
Benefits of RTO Operation Net of RTO Operational Costs	$19	$32	$32

Economic Impact to Nevada from Increased Spending Power for Households

Table 2 presents the economic impacts to Nevada from increased spending power for households due to lower electricity prices afforded by an RTO. These results factor in the "leakage" that is expected out of the economy,[4] as well as the impact of the direct and multiplier effects attributed to an increase in household expenditures that can occur when electricity prices in Nevada are lower with an RTO than they otherwise would have been.

[3] These data points were generally taken from the "*State-Led Market Study*" (*Exploring Western Organized Market Configurations: A Western State's Study of Coordinated Market Options to Advance State Energy Polices*) dated July 30, 2021 which includes two companion reports: Technical Report, Market and Regulatory Review.

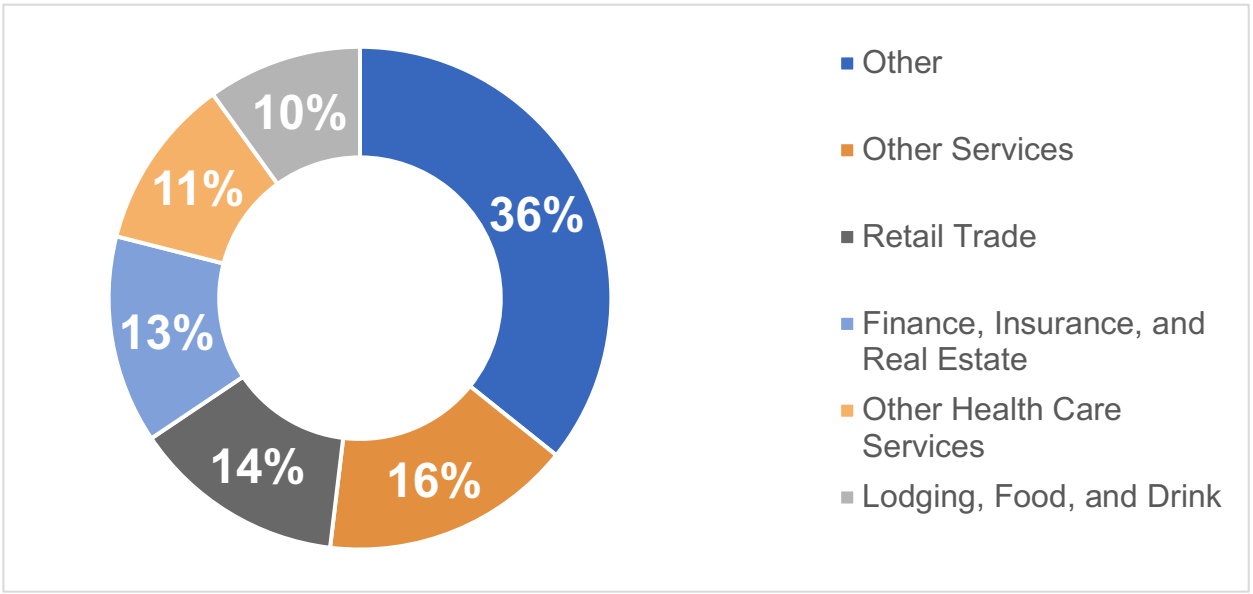
[4] Leakage accounts for the fact that some of the increased spending for goods and services will leave the economy and will not recirculate within it (for instance, it may be spent on goods overseas).

Table 2 Annual Economic Impact to Nevada from Increased Spending Power for Households due to an RTO

Nevada Economic Impacts from Increased Spending Power for Households	2025	2030	2035
Pre-Leakage Electricity Cost Savings (Millions 2022$)	$19	$32	$32
Post-Leakage Electricity Cost Savings (Millions 2022$)	$14	$24	$24
Gross State Product (Millions 2022$)	$15	$26	$26
Total Compensation (Millions 2022$)	$8	$14	$14
Total New Ongoing Jobs (FTEs)	159	266	271
Total Indirect Taxes (Millions 2022$)	$1.3	$2.1	$2.2

Figure 2 shows the top industries in Nevada that are expected to be affected by increased spending power for households and which see new employment created in the state.

Figure 2 Jobs Created in Nevada (2030) from Increased Spending Power for Households due to an RTO



Economic Impact to Nevada Associated with Expanded Business Activity and Clean Energy Investment

New and Expanded Business Activity from Lower Electricity Prices

The *Western RTO Economic Impact Study: Region Wide Analysis* discussed the potential for increased economic activity from additional and expanded business activity associated with the competitive advantages offered by lower electricity costs. Figure 3 and Table 3 illustrates the range of potential direct employment impacts in Nevada, by industry, from the RTO's ability to lower electricity prices from what they otherwise would be which, in turn, can increase business formation and business growth within Nevada. Table 3 includes both low-end and high-end bookend values for 2030, along with the current employment and compensation by industry for context.

Figure 3 Composition of Direct Job Growth in Nevada, by Industry, from Additional Business Activity

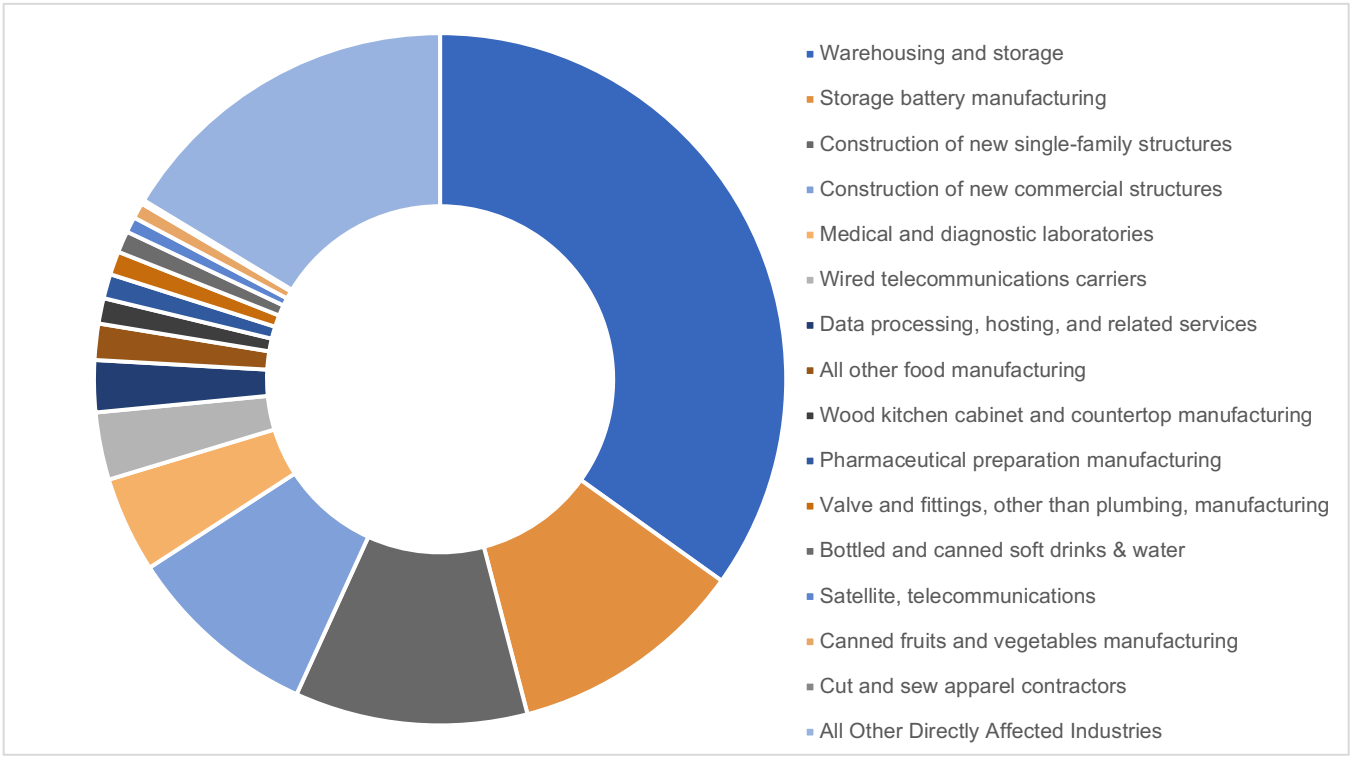


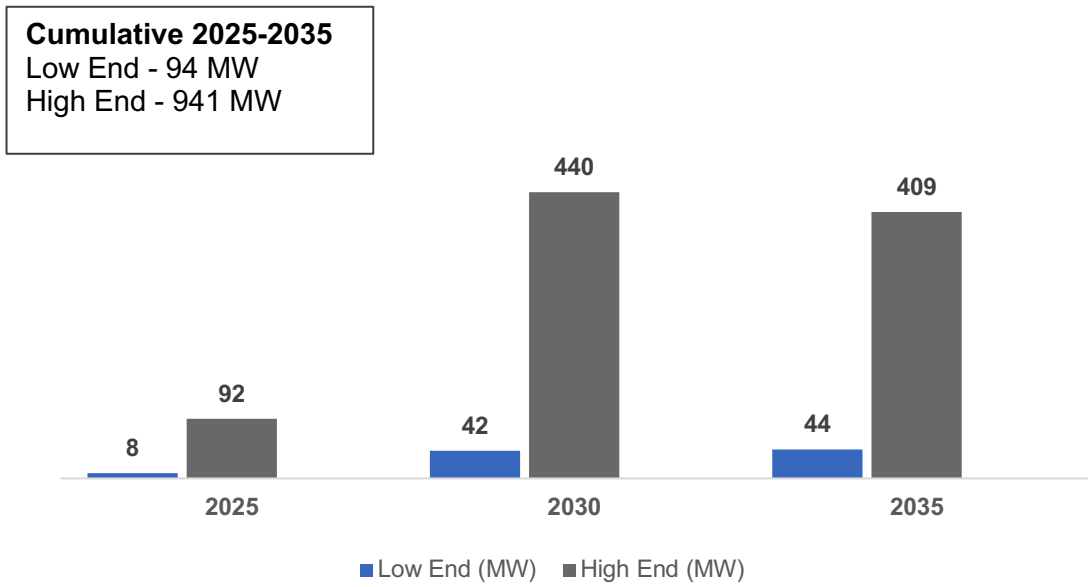
Table 3 Key Industries Expected to Grow or Locate in Nevada Due to Lower Electricity Prices from an RTO

	Industry	Low Direct Growth FTE (2030)	High Direct Growth FTE (2030)	Current Employment (2022)	Average Annual Payroll and Benefits
1	Warehousing and storage	764	3,472	34,007	$48,655
2	Storage battery manufacturing	242	1,098	3,781	$139,537
3	Construction of new single-family structures	238	1,083	25,220	$66,211
4	Construction of new commercial structures	198	902	14,662	$65,652
5	Medical and diagnostic laboratories	98	445	5,120	$77,100
6	Wired telecommunications carriers	69	313	4,328	$72,519
7	Data processing, hosting, and related services	53	241	3,325	$92,164
8	All other food manufacturing	37	170	469	$39,251
9	Wood kitchen cabinet and countertop manufacturing	26	119	688	$59,362
10	Pharmaceutical preparation manufacturing	25	114	704	$83,121
11	Valve and fittings, other than plumbing, manufacturing	24	111	240	$71,254
12	Bottled and canned soft drinks & water	22	99	772	$73,463
13	Satellite, telecommunications	16	74	991	$71,010
14	Canned fruits and vegetables manufacturing	16	72	226	$76,733
15	Cut and sew apparel contractors	4	19	304	$12,918
	All Other Directly Affected Industries	358	1,625	1,762	$87,525
	Total in Directly Effected Industries	***2,190***	***9,957***	***96,599***	***$71,030***

Incremental Clean Electricity Resource Investment

Development of an RTO may also result in increased clean electricity resource development in the West, including in Nevada. Figure 4 shows the new clean electricity investments (in MW) in Nevada for the low end and high-end cases by year. This incremental investment is expected to occur because the structural changes to the electricity market resulting from RTO formation provide greater opportunities for meeting corporate clean energy demand. This type of renewable energy development is currently taking place primarily in regions with RTOs.

Figure 4 Additional Clean Electricity Construction Estimated in Nevada with an RTO



Combined Results from New/Expanded Business Activity and Incremental Clean Electricity Investments

Tables 4 and 5 report the economic impacts from the new business activity and new clean energy investments broken out by year and by permanent or temporary construction impacts. Note that Tables 4 and 5 do *not* include the impacts from lower electricity prices on households, which are included later in the document (in Tables 6 and 7).

Table 4 Low-End Economic Impact from New/Expanded Business Activity and Clean Electricity Investments in Nevada

Nevada Low-End New Business Economic Impacts	Type	2025	2030	2035
Gross State Product (Million 2022$)	Permanent	$350	$483	$504
	Construction/Temporary	$3	$11	$10
Total Compensation (Million 2022$)	Permanent	$222	$306	$318
	Construction/Temporary	$1	$5	$5
Total Jobs (FTE)	Permanent	3,357	4,630	4,821
	Construction/Temporary	22	76	75
Total Indirect Taxes (Million 2022$)	Permanent	$16	$22	$23
	Construction/Temporary	$0.1	$0.3	$0.3

Table 5 High-End Economic Impact from New/Expanded Business Activity and Clean Electricity Investments in Nevada

Nevada High-End New Business Economic Impacts	Type	2025	2030	2035
Gross State Product (Million 2022$)	Permanent	$1,592	$2,203	$2,300
	Construction/Temporary	$34	$110	$97
Total Compensation (Million 2022$)	Permanent	$1,007	$1,391	$1,450
	Construction/Temporary	$16	$51	$45
Total Jobs (FTEs)	Permanent	15,262	21,067	21,952
	Construction/Temporary	243	792	700
Total Indirect Taxes (Million 2022$)	Permanent	$73	$102	$107
	Construction/Temporary	$1.0	$3.3	$2.9

Range of Total Economic Impacts for Nevada

This section provides the ***total*** range of anticipated economic impacts, including impacts from increased household spending power and impacts to businesses (both new/expanded business activity from more competitive electricity prices and new clean electricity resource development). Table 6 illustrates the low-end total economic impacts, by year and Table 7 illustrates the high-end impacts.

Table 6 Low-End Total Economic Impacts Results for Nevada Attributed to RTO Formation

Nevada Low-End TOTAL Economic Impacts	Type	2025	2030	2035
Gross State Product (Millions 2022$)	Permanent	$365	$509	$530
	Construction/Temporary	$3	$11	$10
Total Compensation (Millions 2022$)	Permanent	$230	$319	$332
	Construction/Temporary	$1	$5	$5
Total Jobs (FTEs)	Permanent	3,517	4,896	5,092
	Construction/Temporary	22	76	75
Total Indirect Taxes (Millions 2022$)	Permanent	$17	$24	$25
	Construction/Temporary	$0.1	$0.3	$0.3

Table 7 High-End Total Economic Impact Results for Nevada Attributed to RTO Formation

Nevada High-End TOTAL Economic Impacts	Type	2025	2030	2035
Gross State Product (Millions 2022$)	Permanent	$1,607	$2,228	$2,326
	Construction/Temporary	$34	$110	$97
Total Compensation (Millions 2022$)	Permanent	$1,016	$1,405	$1,464
	Construction/Temporary	$16	$51	$45
Total Jobs (FTEs)	Permanent	15,421	21,333	22,223
	Construction/Temporary	243	792	700
Total Indirect Taxes (Millions 2022$)	Permanent	$74	$104	$109
	Construction/Temporary	$1.0	$3.3	$2.9

The charts below (Figures 5, 6, and 7) illustrate the range of economic impacts that might be expected to accrue to Nevada based on the low-end and high-end cases assessed in the study. They represent, in chart format, the same information that can be found in Tables 6 and 7. Figure 5 illustrates, by representative year, the expected increases in ***ongoing*** GSP, total compensation (payroll and benefits,) and indirect business taxes that could be added in the state due to the existence of an RTO. Figure 6- illustrates the ***construction/temporary*** economic impacts, based on the year in which the construction is expected to take place. And Figure 7 shows the range of both ***permanent and temporary jobs*** that could be created in the state.

Figure 5 Permanent Economic Impacts to Nevada from an RTO

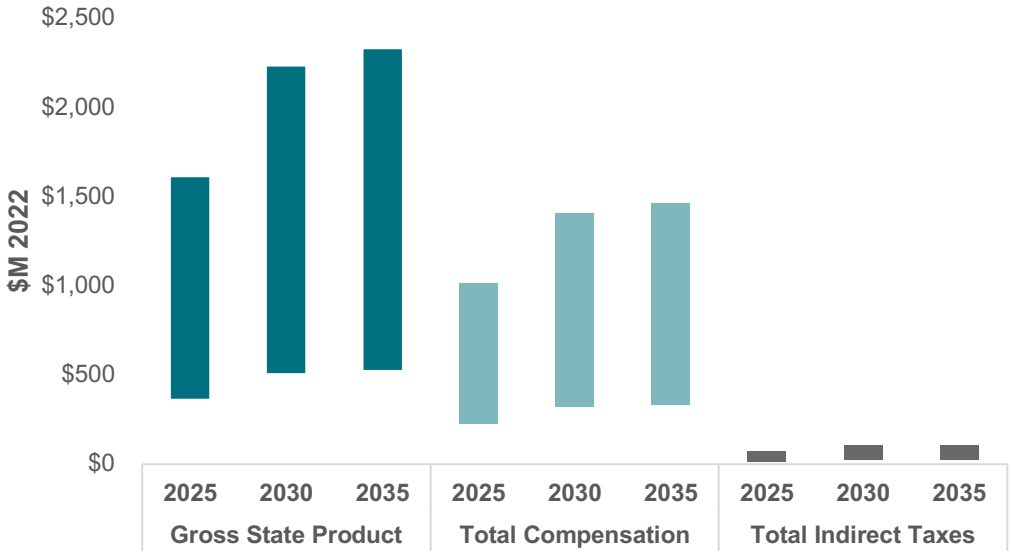


Figure 6 Construction/Temporary Economic Impacts to Nevada from an RTO

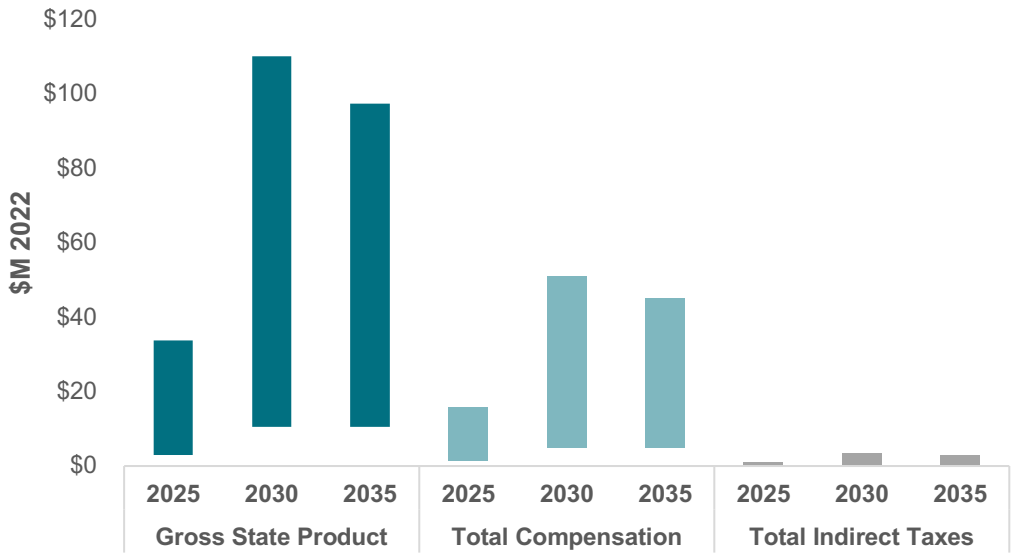
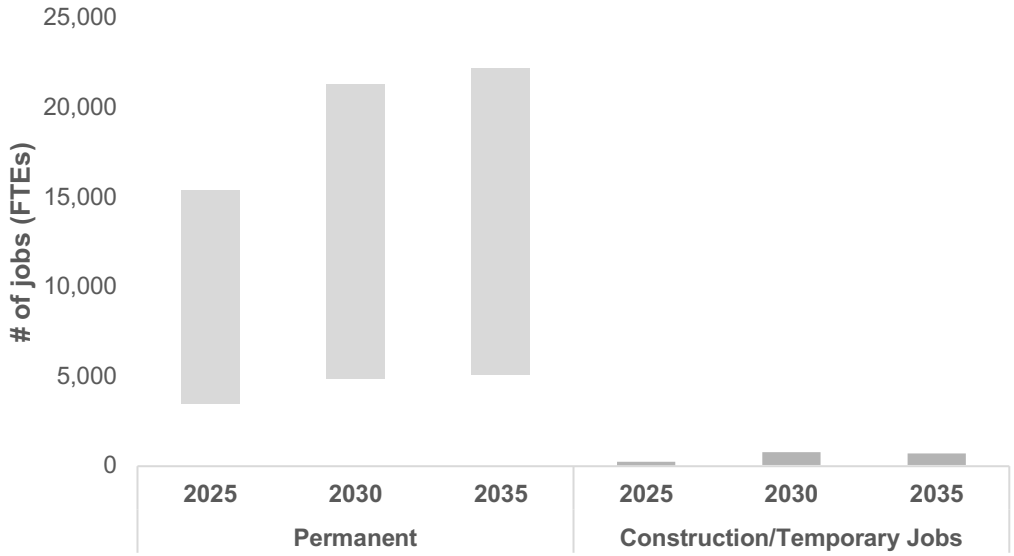


Figure 7 Permanent and Temporary Nevada Jobs (FTEs) Created by an RTO



Additional Impacts from Direct RTO Investments

Additional, positive economic impacts could also result if incremental RTO investments were to take place in Nevada. While no attempt was made to identify in which state(s) these investments would occur, the West-wide report provides a general range for the magnitude and types of impacts that a state such as Nevada might expect if the incremental RTO investments needed for a west-wide RTO were to occur in the state.

Conclusion

Based on the results of this study work, the State of Nevada can expect significant economic benefits from a West-wide RTO. Benefits to the economy are anticipated to be driven by:

- Electricity cost savings providing higher levels of disposable income for households than they would have in a continuation of the current electricity market structure;
- Expansion of existing or attraction of new businesses to the Western states, including Nevada; and
- The potential for additional clean electricity resource development in the state to meet corporate demand.

The sooner RTO development occurs, the sooner Nevada can begin to realize these economic benefits.