

## *Legislative Performance Audit Committee*

FOR IMMEDIATE RELEASE  
CONTACT: Senator John Kuehn, (402) 471-2732

November 29, 2017

### **Performance Audit Committee Releases Two Tax Incentive Audits**

The Legislative Audit Office today released reports on two tax incentive programs. Performance Audit Committee Chairman John Kuehn said that the reports provide the Legislature with new information on the Nebraska Advantage Research & Development Act and the Nebraska Advantage Rural Development Act. He added that, “the Legislative Audit Office has now done three tax incentive audits. All have clearly shown that the Legislature needs to be able to gather more information in order to answer questions we have about how incentives work. I will be working with legislators, stakeholders, agencies and the executive branch to follow through on the Committee’s recommendations in these reports.”

The audits are the second and third performed under a 2015 bill that requires all economic development tax incentives to receive such a review by the Legislative Audit Office at least once every three years.

In the Research and Development audit, the Committee recommended that all future tax incentive legislation include a “Performance Statement”. Senator Kuehn stated, “Performance Statements would detail the specific goals a tax incentive is intended to accomplish, how we think it will accomplish those goals, and what constitutes success or failure.” The reports noted that current incentive programs have goals that are too broad and ill-defined to allow for a judgment on whether or not they have been successful.

The Research and Development audit found that the costs of the program are likely to increase in the future. The R&D credit is tied to the federal Research and Experimentation Tax Credit, which the Treasury Department expects to have a cost increase of 700% in the next ten years.

The R&D audit also reports that Nebraska was found to be the most competitive for R&D companies compared to neighboring states.

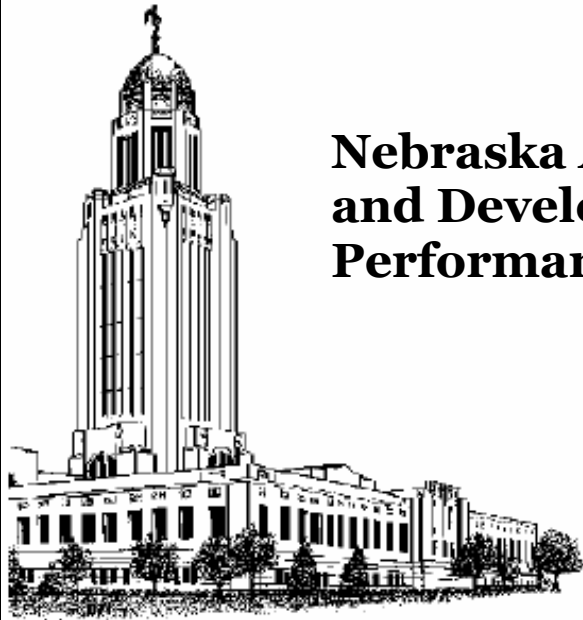
The audit of the Rural Development program reviewed 70 participants, who earned \$5.62 million in tax credits between 2004 and 2015.

The audit found that the wages that companies are required to pay workers in order to earn employment credits were an average of 42% lower than the statewide average wage during the analysis period. Additionally, the Audit Office was unable to perform a cost per job analysis for the program. The Committee recommends that the Nebraska

Advantage Rural Development Act be amended to require that investment and employment credits be tracked separately so that information on the actual number of jobs subsidized by the program is available.

The audit also found that the program contains several fiscal protections including performance-based incentives, recapture provisions, and a yearly spending cap, placing it at low risk for exceeding expected costs.

Senator Kuehn said, “We have a lot of work to do on tax incentives. I believe that more information will lead to better public policy. The people of Nebraska deserve to know what they are getting for their tax dollars.”



**Nebraska Advantage Research  
and Development Act  
Performance on Selected Metrics**

**Performance Audit Committee  
Nebraska Legislature**

November 2017

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Stephanie Meese, Legal Counsel  
Diane Johnson, Division Executive Assistant  
Performance Auditors:  
Craig Beck  
Franceska Cassell  
Anthony Circo  
Clarence Mabin  
Dana L. McNeil

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**LEGISLATIVE AUDIT OFFICE**  
**Nebraska Legislature**  
**State Capitol • Box 94604 • Lincoln**

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***I. Committee Recommendations***





## **Audit Summary and Committee Recommendations**

The Nebraska Advantage Research and Development (R&D) Act is a tax incentive directed towards corporate research and development and is administered by the Department of Revenue. Tax credits are awarded for research and development activities that earn federal Research and Experimentation tax credits. The credits can be used to offset income and/or state sales and use taxes.

The Audit Office reviewed projects that received R&D Act (Act) benefits between 2007, when the first companies received benefits, and December 31, 2015, the latest date for which the Nebraska Department of Revenue had confirmed figures when the audit began. During that period, 235 companies made claims under the Act, and 222 received benefits.

Section II of the audit report describes the Research and Development program and additional details on benefit usage. Section III presents our analysis of program metrics, organized by the scope statement question to which they apply. The findings and Performance Audit Committee recommendations for each scope question follow.

### **Analysis of Metrics**

The metrics used in this audit were selected by policymakers several years after the Act's adoption, meaning the expected performance of the Act in relation to the metrics is largely unknown. Without a standard of expected performance, the Office could not make simple "yes" or "no" judgements about whether the reported performance meets policymakers expectations. Instead, the Office simply reports the results of the analysis for each metric.

The Audit Office does not assert that the actions of incentivized companies reported here were caused by their participation in the Research and Development Act. Because a company's actions may be the result of many factors, it is difficult, if not impossible, to prove the effect of participation in one program.

## **Performance Audit Committee Recommendations**

**Scope Question:** *Is the Research and Development Act meeting the goal of strengthening the state's economy overall by attracting new business to the state, expanding existing businesses, increasing employment, creating high-quality jobs, and increasing business investment?*

### **Compliance Costs**

#### ***What is the cost for businesses to comply with the Act?***

Because the R&D Act ties benefits to the federal Research and Experimentation Tax Credit, companies face the high compliance costs associated with the federal credit before the Nebraska credit can be claimed.

**Finding:** Research by the Government Accountability Office indicates it is likely that high compliance costs have a negative effect on credit effectiveness and participation. However, the tradeoff for relying on the federal qualification process instead of administering it at the state level is that the state avoids the difficulties and costs that may come with it. (pg. 9)

**No Recommendation.**

### **Other State Benefits Metric**

#### ***Did companies participating in the R&D program receive other public funding?***

Of the 235 companies that claimed credit under the R&D Act, 115 received another state benefit from programs administered by the Department of Revenue. Those companies received more than \$1.8 billion, most of which was from LB 775. In a previous audit, we were able to determine whether program participants also participated in programs administered by the Department of Economic Development, but could not do so for this program.

There is no finding related to these results because there is no standard to compare the program data to in order to judge whether this level of participation in other programs meets policymakers' expectations.

**Finding:** We were unable to determine whether Research and Development program participants also participated in several Department of Economic Development programs because confidentiality requirements kept us from being able to share the R&D participant names with DED. (pg. 11)

**Recommendation 1:** The Legislature should work with the Department of Revenue and the Department of Labor to find a means by which R&D program participants can be matched with DED programs.

## **Competitiveness Metric**

### ***Is the Act competitive with other states' R&D efforts?***

Nebraska's research and development tax credit is smaller than those in Iowa and Kansas but provides more benefits than Colorado's.

When Nebraska and its six neighboring states are compared using a broader assessment of overall tax climates and not just the R&D credit, Nebraska has been rated by the Tax Foundation as the most competitive for Research and Development companies.

**Finding:** Despite differences among neighboring states in policies specific to Research and Development tax credits, Nebraska ranks well compared to its neighboring states under a broader review of state tax climates. (pg. 13)

## **New to Nebraska Metric**

### ***How many of the incentivized companies were new to Nebraska?***

Eleven (5%) of the 235 companies that claimed the Research and Development tax credit met our definition of a company that was new to the state.

There is no finding because there is no standard to compare the program data to in order to judge whether the number of new companies participating in the program meets policymakers' expectations.

**Recommendation 2:** The Legislature should consider defining new to Nebraska, either using the definition used in this audit or creating another definition.

**Recommendation 3:** The Legislature may want to consider approaches to attracting new businesses that research suggests are more important to businesses looking to relocate.

## **Private Research & Development Spending Metric**

### ***Is the Act increasing private R&D spending in Nebraska?***

Business R&D spending in Nebraska has increased, but we make no finding on whether the Act impacted that increase. Statistical tests that could suggest whether the increase was potentially due to the Act were inconclusive. Comparisons of Nebraska's spending trends before and after the Act, and of Nebraska's spending trends compared to U.S. trends, were hampered by a lack of sufficient data as well as difficulty in sorting out the potential impact of the Great Recession.

## Research & Development Comparisons Metric

### ***How does Nebraska's private R&D spending compare with surrounding states?***

In several comparisons to surrounding states, Nebraska ranks 5<sup>th</sup> out of seven states in metrics relevant to private R&D performance.

**Finding:** Nebraska's business Research and Development spending levels and rankings have not changed in a way that affects its relation to surrounding states since the R&D Act was enacted. (pg. 22)

**Scope Question:** *Is the Act meeting the goal of diversifying the state's economy and positioning Nebraska for the future by stimulating entrepreneurial, high-tech, and renewable energy firms?*

## High-tech Sector Metric

### ***Is the Act stimulating high-tech firms in the state?***

Using our definition of "high-tech" industries, Nebraska's high-tech sector has not recovered to its 2001 employment levels and has not kept pace with the U.S. as a whole in the evaluation years. Sixty-four companies in high-tech industries were awarded \$10.6 million in R&D credits from 2006-2015.

There is no finding because there is no standard to compare the program data to in order to judge whether the amount is enough to meet policymakers' expectations.

**Recommendation 4:** If the Legislature would like to target high-tech industries for tax incentive programs or evaluations, it should clearly define what it means by a "high-tech" firm, preferably by using North American Industry Classification System (NAICS) industry sector codes for ease of administration and analysis.

## Renewable Energy Sector Metric

### ***Is the Act stimulating renewable energy firms in the state?***

Using our definition of "renewable energy" industries, Nebraska's renewable energy sector has gained strength during the evaluation years. Although the sector has been growing, both in absolute employment capacity and in relative terms compared to the U.S., it is still behind the U.S. as a whole. Nineteen companies in the renewable energy sector were awarded \$1,119,947 in R&D credits from 2006-2015.

There is no finding because there is no standard to compare the program data to in order to judge whether the amount is enough to meet policymakers' expectations.

**Recommendation 5:** If the Legislature would like to target renewable energy industries for tax incentive programs or evaluations, it should clearly define what it means by a “renewable energy” firm, preferably by using NAICS industry sector codes for ease of administration and analysis.

### **Brain Drain Metric**

#### ***Has the Act affected brain drain in Nebraska?***

It is difficult to determine the extent of brain drain (the net number of highly educated people moving out of Nebraska), but the best estimates by the Nebraska Coordinating Commission for Postsecondary Education indicate that it is occurring. It is also difficult to determine what role the R&D program plays in retaining highly educated people in the state.

A sample logic chain included in this section of the report demonstrates how policymakers might identify specifically how Research and Development spending may be impacting brain drain.

There is no finding about the program performance because there is no standard to compare the program data to in order to judge whether the amount is enough to meet policymakers’ expectations.

**Finding:** Future evaluations may be improved if policymakers use a logic chain or other method of clearly identifying the factors they believe connect Research and Development spending to brain drain. (pg. 39)

**Recommendation 6:** If the Legislature would like to Audit Office to directly answer this question, it may need to require additional information to be provided by participating companies.

**Recommendation 7:** In order to produce more meaningful evaluations and accountability for results, the Legislature should consider requiring logic chains and relevant performance targets to all intended effects and program goals for all current and future tax incentive programs. These two recommendations reinforce each other. The Legislature could use the state of Washington’s evaluation law as a model for both.

The Fiscal Analyst’s comments on our findings and recommendations estimate a cost for this recommendation of roughly \$50,000 per year for personnel and operating costs. That cost was based on the assumption that there would be a forthcoming bill to implement an updated evaluation program.

We discussed with the Fiscal Analyst that we believe it more likely that this recommendation would be pursued as a legislative rules change rather than a bill. The Fiscal Analyst believes the potential cost remains because the Audit Office could request additional staff to support the process, and, if the logic chains are to be added to the

legislature's website (similar to statements of intent), the Clerk's Office could incur costs for software programming.

We understand this reasoning but believe we could support Senators in developing logic chains without additional staff. Whether or not there would be costs for the Clerk's Office depends on what exactly would be needed to update the legislative website. (Prior to the report's release, these recommendations were still confidential, so the Clerk's Office had not been consulted.)

***Scope Question:*** *What are the economic and fiscal impacts of the Act?*

### **Administrative Cost Metric**

***What is the cost to administer and promote all tax incentive programs?***

The total cost for administering all tax incentive programs from 2004-2015 was \$20.5 million.

**Finding:** We are unable to report the cost to administer and promote the Research and Development Act because those figures are not specifically tracked. (pg. 45)

**Recommendation 8:** If the Legislature would like more precise costs for the Research and Development Act administration and promotion, it may need to require that Departments of Revenue and Economic Development track expenditures by program. However, it may not be possible to do that in all instances. For example, according to DED, all incentive programs are promoted together and cannot be broken down by individual program.

***Scope Question:*** *Are adequate protections in place to ensure the fiscal impact of the Act does not increase substantially beyond the state's expectations?*

### **Fiscal Protections Metric**

***What are the fiscal protections in the Act?***

The R&D Act contains some fiscal protections including performance-based incentives as well as monitoring and information sharing, but does not contain more substantive protections such as regularly forecasting costs or program caps.

**Finding:** Because the Research and Development Act does not contain more stringent fiscal protections, the program is at a higher risk for exceeding expected costs. Although the Act has stayed within the state's expectations during the years being evaluated, changes in the federal Research and Experimentation Credit will likely increase costs to the state. (pg. 46)

**Recommendation 9:** If the Legislature is concerned with the risk level for exceeding expected costs, it should consider adding more stringent fiscal protections to the Act.

### **Metrics Requiring Economic Modeling**

Due to limitations on existing data and statutory protections on taxpayer confidentiality, the Audit Office (Office) was unable to answer some of the questions that the Performance Audit Committee (Committee) was most interested in. Those questions include estimates of job growth and the larger impact of the program on the state economy that would have resulted from analysis using economic modeling software. The Office continues to work to find a way to accomplish the economic modeling analyses.





***II. Legislative Audit Office Report***



*Legislative Audit Office Report*  
**Nebraska Advantage Research and  
Development Act Performance on Selected  
Metrics**

*November 2017*

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*Prepared by*  
**Anthony Circo  
Martha Carter  
Craig Beck**



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# INTRODUCTION

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The Legislative Audit Office is required to conduct a performance audit of each business tax incentive program at least once every three years. In 2016, we released the first performance audit under the requirement. In 2017, we release this performance audit of the Nebraska Advantage Research and Development Act, and another of the Nebraska Advantage Rural Development Act. Both provide certain tax benefits to companies that meet specific requirements. In general terms, participating businesses must create jobs and/or make new financial investments in the state. In return, they are eligible for tax credits that may be used for a variety of purposes.

## **Nebraska Advantage Research and Development Act**

The Nebraska Advantage Research and Development Act (Act) was passed in 2005 as a part of a package of bills designed to update Nebraska’s business tax incentive programs to bring jobs and investment to the state. The Act is a tax incentive directed towards corporate research and development and is administered by the Department of Revenue. Tax credits that can be used to offset income and/or state sales and use taxes are earned for Research and Development (R&D) expenses that earn federal R&D tax credits. Currently, qualified business R&D expenses in Nebraska earn 15% of the federal credit as Nebraska credit, or earn 35% if the activity occurs on the campus of, or site owned by, a college or university. The credit can be earned for 20 years after the first year claimed.

## **Measuring Effectiveness**

In previous reports, the Audit Office (Office) has noted that it is difficult to determine whether Nebraska’s tax incentive programs are effective because the laws creating them do not have clear goals and specific measures for achieving those goals. In a 2013 report on the Nebraska Advantage Act and other tax incentive programs, the Office concluded: “the program goals expressed by the Legislature in the statutes and during legislative debate are too general to permit a meaningful evaluation of whether the programs are, in fact, accomplishing what the Legislature hoped they would accomplish.”<sup>1</sup>

In the 2014 legislative session, the Performance Audit Committee introduced and the Legislature passed LB 836, which added slightly more specific goal language to the tax incentives statutes. Nevertheless, the language remains quite broad. Also in 2014, the Performance Audit Committee established an interim legislative study (LR444) that identified metrics for tax incentive performance audits and directed the Audit Office to use those metrics, as available. We also use metrics contained in the statutes creating the incentive program or discussed in the legislative history. Following are the metrics used in this audit and their source.

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<sup>1</sup> Nebraska Legislature, Performance Audit Committee, *Nebraska Department of Revenue: An Examination of Nebraska Tax Incentive Programs*, February 2013.

## Metrics for Nebraska Advantage Research and Development Act Audit

Source	Description
LR444	Investment by incentivized companies
LR444	Other state financial assistance received by incentivized companies
Statute	Number of participating companies new to Nebraska
LR444	Number of high-tech businesses
LR444	Number of renewable energy businesses
LR444	Cost for agencies to administer & promote the Act
LR444	Cost for businesses to comply with the Act
LR444	Fiscal protections
Statute	Has R&D funding increased?
Statute	How does R&D funding trend in Nebraska compare to neighboring states?
Statute	Brain drain
Statute	Nebraska's competitiveness

### Report Organization

Section I describes the Research and Development program and Section II contains our analysis of the metrics.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on the audit objectives. The methodologies used are described briefly in each section.

### Acknowledgements

The Legislative Audit Office extends special thanks to Tax Commissioner Tony Fulton and Commissioner of Labor John Albin. We also appreciate assistance of Mary Hugo, Kate Knapp, and Liz Gau at the Department of Revenue; Jennifer Gildersleeve and Scott Hunzeker at the Department of Labor; David Dearmont at the Department of Economic Development; and Professor Kent Eskridge of the University of Nebraska–Lincoln.



## **SECTION I: Nebraska Advantage Research and Development Program**

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The Nebraska Advantage Research and Development (R&D) program was created in 2005 as a part of a package of bills designed to update Nebraska's business tax incentive programs. The program provides tax benefits for companies that increase certain corporate research and development expenditures.

The Nebraska R&D program is tied to the federal Research and Experimentation credit. A Nebraska company that qualifies under the federal program can receive benefits under the Nebraska program for the portion of its qualifying activities that occurred in Nebraska. Participants may claim either 15% of the apportioned federal credit or 35%, if the activity occurred on the campus of, or site run by, a college or university. Company participation lasts for 20 years after the first year claimed.

Earned credits may be used to obtain a refund of state sales tax or to reduce income tax liability. Additionally, credits used against income taxes are refundable—meaning a participant may receive payment for the full value of earned credits even if that amount is more than the income tax owed. Participants do not have to apply to the Nebraska program to use earned credits, they simply file a claim with the Department of Revenue (Department of Revenue).

Companies can also use credits for state sales and use tax refunds. However, the program has no impact on local budgets because credits cannot be used to refund local option sales taxes. Additionally, Revenue documents show that no company in the review period had requested a sales and use tax refund.<sup>2</sup>

Participants must use their credits for the year in which they are earned and there is generally no need for recapture. The most likely reasons benefits might change after a company received them would be if a Revenue audit found an error or if the company filed an amended return.<sup>3</sup>

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<sup>2</sup> The Department suggests there are at least three possible reasons that companies do not use this option: 1. Applying credits to a company's income tax liability is more beneficial because it is fully refundable, so the company will get a refund for the value of any credits that exceed its income tax liability; 2. It is simpler for a company to make a claim against one type of tax rather than two; 3. The company may have paid little or no sales tax.

<sup>3</sup> Participants are also subject to a three year statute of limitations. This means that participants have three years *beyond* the year in which the credits were earned to claim them on their tax return. The statute of limitations applies broadly, and is not just applicable to this program. In some instances, it is possible for the participant to claim credits more than three years beyond the year they were earned, but that requires filing a form with the Department requesting an extension.

## Program Usage

Department of Revenue records were examined to find the number of companies that claimed credits under the Act, the number that received benefits, the amounts awarded, and the amounts used. All figures reported in this section refer to the years the claims and benefits were processed by the Department, not the tax years for which they were claimed. Between 2007 and 2015, 235 companies filed claims for the R&D credit. Of those, 222 were successful and used \$24,108,453 in R&D benefits.<sup>4</sup> The number of companies that attempted to claim credit, as well as those that received benefits, have risen in all but one year (2012) of the evaluation period (Figure 1.1).

**Figure 1.1. Research & Development Credit Participation, 2007-2015**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
<b>Companies Claiming Credit</b>	23	67	77	88	109	100	119	134	146	<b>235</b>
<b>Companies Receiving Credit</b>	20	62	68	82	85	75	101	127	127	<b>222</b>

Source: Audit Office analysis of Department of Revenue data.

## Benefits<sup>5</sup>

As shown in Figures 1.2 and 1.3, the number of companies successfully claiming the credit has gone up, so has the total dollar amount of credits awarded. The amount grew from \$69,320 in 2007 to about \$3.7 million in 2015. The largest amount was in 2014, with \$4.5 million awarded. The total earned credits during this time was about \$24.7 million; however, only \$24.1 million of credits were used.<sup>6</sup>

**Figure 1.2. Research & Development Credit Benefits Awarded, 2007-2015**

<b>Benefits Awarded</b>	2007	2008	2009	2010	2011
	\$69,320	\$2,132,705	\$2,302,408	\$4,173,983	\$2,434,025
	2012	2013	2014	2015	Total
	\$2,854,770	\$2,493,538	\$4,525,841	\$3,713,829	<b>\$24,700,418</b>

**Figure 1.3. Research & Development Credit Benefits Used, 2007-2015**

<b>Benefits Used</b>	2007	2008	2009	2010	2011
	\$64,166	\$2,106,028	\$2,235,956	\$4,074,589	\$2,363,525
	2012	2013	2014	2015	Total
	\$2,712,203	\$2,485,310	\$4,461,429	\$3,605,247	<b>\$24,108,453</b>

Source for Figures 1.2 and 1.3: Audit Office analysis of Department of Revenue data.

<sup>4</sup> The Department says that many denied claims are due to insufficient E-Verify and federal R&E benefit documentation.

<sup>5</sup> The information reviewed by the Audit Office was provided previous to the issuance of the Revenue Department's 2017 Tax Incentives Annual Report, and was the most accurate available at the time. The differences reflect one clerical error that was corrected for processing year 2013, and revised returns and audits that occurred after the 2016 Annual Report was released.

<sup>6</sup> For pass-through corporations, benefits can be used on individual personal income taxes. However, benefits used on personal income tax are not refundable, and must have a liability to offset. If there is no liability, the individual cannot use the benefit.

## Enhanced Credit

In 2009, the Legislature passed LB 555, which increased the benefit companies can receive to 35% for expenditures on property owned by a college or university. The first year the enhanced credit was eligible to be claimed was 2011, for expenditures in 2010. In the years of the evaluation period, eight companies took advantage of the enhanced credit for a total of \$58,081. Figure 1.4 shows the enhanced benefits received each year.

**Figure 1.4. Enhanced Benefits Received, 2011-2015**

	2011	2012	2013	2014	2015	Total
<b>Companies that Received Enhanced Credit</b>	3	*	*	3	*	<b>8</b>
<b>Amount of Awarded Credit that was Enhanced Credit</b>	\$2,821	*	*	\$21,559	*	<b>\$58,081</b>

Source: Audit Office analysis of Department of Revenue data.

An asterisk (\*) means information could not be reported in order to protect taxpayer confidentiality.



## **SECTION II: Analysis of Metrics**

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Before presenting the Research and Development Act audit's scope questions and the metrics used to answer each, we note several points that will aid in the understanding of the audit results and findings.

### **Causation**

The number one problem when evaluating tax incentives programs is that it is often impossible to show that a program *caused* specific results because there are many other factors that could have influenced the participants' decision-making. In this report, we do not claim that the program caused the results we report.

### **Standards**

For many of the metrics reviewed in this report, the Legislature has not created a standard that indicates how much the Legislature expected the metric to improve under the program. When possible, we have identified reasonable standards that we compare the program performance to, but we acknowledge there may be other legitimate standards that could be used as well.

### **Results**

The results for each metric describe the product of the analysis we conducted. For example, if the metric was whether program spending increased over time, we report whether it did or not as the result. Results do not include judgments about how well the program is succeeding.

### **Findings**

Findings involve making a judgment about how the program results on a given metric compare to a standard. For a program that had increased spending over time, the standard could be the increase or decrease in that type spending for the United States as a whole. Our finding would be whether there was a difference in Nebraska's rate of spending and the U.S. rate of spending.

### **Taxpayer Confidentiality**

Federal and state law restrict release of most taxpayer data, with certain specified exceptions. In general terms, laws protecting taxpayer confidentiality prevent reporting figures that include fewer than three companies if the results are statewide, and fewer than 10 companies if the results are from a smaller portion of the state.

The Performance Audit Committee asked the Audit Office to answer four questions regarding the Research and Development Act, utilizing the metrics listed below each question:

1. Is the Research and Development Act meeting the goal of strengthening the state's economy overall by attracting new business to the state, expanding existing businesses, increasing employment, creating high-quality jobs, and increasing business investment?
  - **Compliance Costs:** What is the cost for businesses to comply with the Act?
  - **Other State Benefits:** Did companies participating in the R&D program receive other public funding?
  - **Competitiveness:** Is the Act competitive with other states' R&D efforts?
  - **New to Nebraska:** How many of the incentivized companies were new to Nebraska?
  - **Private R&D Spending:** Is the Act increasing private R&D spending in Nebraska?
  - **R&D Comparisons:** How does Nebraska's private R&D spending compare with surrounding states?
2. Is the Act meeting the goal of diversifying the state's economy and positioning Nebraska for the future by stimulating entrepreneurial, high-tech, and renewable energy firms?
  - **High-tech Sector:** Is the Act stimulating high-tech firms in the state?
  - **Renewable Energy Sector:** Is the Act stimulating renewable energy firms in the state?
  - **Brain Drain:** Has the Act affected brain drain in Nebraska?
3. What are the economic and fiscal impacts of the Act?
  - **Administrative Cost:** What is the cost to administer and promote all tax incentive programs?
4. Are adequate protections in place to ensure the fiscal impact of the Act does not increase substantially beyond the state's expectations?
  - **Fiscal Protections:** What are the fiscal protections in the Act?

# Compliance Costs

What is the cost for businesses to comply with the Act?

## Results

Because the Research and Development Act ties benefits to the federal Research and Experimentation Tax Credit, companies face the high compliance costs associated with the federal credit before the Nebraska credit can be claimed.

For a company to receive Research and Development (R&D) credits from the state, statute requires that they must first earn benefits on qualified expenditures through the federal Research and Experimentation (R&E) credit. As described below, the federal credit has a long history of high compliance costs, potentially blunting the credit's effectiveness. However, once federal credits have been earned, claiming Nebraska benefits is much less burdensome.

**Finding:** Research by the Government Accountability Office indicates it is likely that high compliance costs have a negative effect on credit effectiveness and participation. However, the tradeoff for relying on the federal qualification process instead of administering it at the state level is that the state avoids the difficulties and costs that may come with it.

## Discussion/Methodology

### Qualification Compliance Issues for Federal Program

In order to earn the R&E credit, federal law requires that a company must prove to the IRS that the expenditures in question qualify by passing a detailed four-part test and by meeting additional standards. Additionally, it involves four potential methods for calculating credits. Both the U.S. Treasury Department and the Government Accountability Office have documented problems arising from the complexity of the program.

In a 2016 report on the federal R&E credit, the U.S. Treasury Department stated:

The compliance burden arises from the need to compute the complicated credit and to maintain documentation dating back years (and even decades in some cases). In addition, the R&E credit has been the source of many disputes between taxpayers and the IRS. Some of these difficulties are unavoidable, such as determining and verifying qualifying research, but others stem from the design of the credit.<sup>7</sup>

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<sup>7</sup> U.S. Treasury, Office of Tax Analysis, *Research and Experimentation (R&E) Credit*, 2016.

A 2009 Government Accountability Office study stated:

There are numerous areas of disagreement between IRS and taxpayers concerning what types of spending qualify for the research credit. These disputes raise the cost of the credit to both taxpayers and IRS and diminish the credit's incentive effect by making the ultimate benefit to taxpayers less certain.<sup>8</sup>

Additionally, in a 2015 study of the credit, the Mercatus Center at George Mason University, stated:

This broad statement speaks to several costs of the R&D credit, most notably, the cost associated with the tax consultants and lawyers who are necessary to navigate what Martin Sullivan calls one of the most complex areas in tax law. Complexity means more resources must be spent on administrative support and on interpreting and following the law.<sup>9</sup>

### **Claiming Nebraska Credit**

Once a company receives federal credit, it need only complete and file several forms with the Department of Revenue for review and processing. Compliance costs at this stage are minimal in comparison to those for the federal credit.

### **Trade-offs**

The effectiveness of the federal tax credit, and therefore the Nebraska credit, is likely reduced by high compliance costs. However, the advantage to the state in tying Nebraska's R&D credit to the federal credit is that the IRS assumes the administrative burden of verifying expenditures, parsing vague definitions, and handling lawsuits.

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<sup>8</sup> General Accountability Office, Report to the Committee on Finance, U.S. Senate, *The Research Tax Credit's Design and Administration Can Be Improved*, 2009.

<sup>9</sup> Mercatus Center, George Mason University, *Can a Research and Development Tax Credit Be Properly Designed for Economic Efficiency?*, 2015.



# Other State Benefits

Did companies participating in the R&D program receive other public funding?

**Results**

Of the 235 companies that claimed credit under the R&D Act, 115 (49%) received another state benefit from programs administered by the Department of Revenue. Those companies received more than \$1.8 billion, most of which was from the Employment and Investment Growth Act (referred to as LB 775).

**Finding:** We were unable to determine whether Research and Development program participants also participated in several Department of Economic Development programs because confidentiality requirements kept us from being able to share the R&D participant names with DED.

Of 235 companies that claimed R&D tax benefits, 115 received \$1,813,733,869 from LB 775, the Nebraska Advantage Act, the Nebraska Advantage Rural Development Act, and the Employment Expansion and Investment Incentive Act (referred to as LB 270). Figure 2.1 breaks down how much the companies received from each program.

LB 775 dates back to 1987 and although companies have not been able to apply for it since 2005, some are still receiving benefits from the program. If LB 775 is not included in these calculations, then 58 participating companies received \$212,769,574 from the other three programs.

**Figure 2.1. Other State Benefits Received by Companies Claiming R&D Credit**

Program	Number of Companies	Amount Received	Percent of Total Additional Funds
<b>LB 775</b>	76	\$1,600,964,295	88.27%
<b>Nebraska Advantage Act</b>	36	\$211,473,711	11.66%
<b>LB 270</b>	23	\$885,613	0.05%
<b>Rural Development Act</b>	4	\$410,250	0.02%
<b>Total</b>	<b>115*</b>	<b>\$1,813,733,869</b>	<b>100%</b>

Source: Audit Office analysis of Department of Revenue data.

\*Total is not equal to the sum of the individual programs because some companies participated in more than one additional program.

## **Discussion/Methodology**

Our 2016 Nebraska Advantage Act performance audit report also included the Ethanol Production Investment Credit (EPIC) and the Microenterprise program. However, not enough of the R&D program companies received benefits from those programs for us to be able to disclose that information and maintain confidentiality. In the Advantage Act report, we also analyzed Advantage Act company participation in several Department of Economic Development (DED) programs. We could not conduct a similar analysis for this report because the names of R&D program participants are confidential and could not be shared with DED.

# Competitiveness

Is the Act competitive with other states' R&D efforts?

## Results

Nebraska's research and development tax credit is smaller than those in Iowa and Kansas but provides more benefits than Colorado's.

When Nebraska and its six neighboring states are compared using a broader assessment of overall tax climates and not just the R&D credit, Nebraska has been rated by the Tax Foundation as the most competitive for Research and Development companies.

**Finding:** Despite differences among neighboring states in policies specific to Research and Development tax credits, Nebraska ranks well compared to its neighboring states under a broader review of state tax climates.

## Discussion/Methodology

### Overall Research and Development Tax Climate

The Tax Foundation is a respected tax policy think tank established in 1937. In 2012 and 2015 it published reports that review state tax climates for a variety of business types including an R&D research facility. For each business type, the authors analyze new firms, which are more likely to be eligible for incentives in many states, and established firms, which are at least 10 years old. Each type of business is given a certain set of characteristic assumptions and its total effective tax rate (TETR) is found for each state based on its mix of tax rates, apportionment rules, and incentive programs.<sup>10</sup> The same business characteristics are used in both reports, which makes the results comparable. Grants and loans are not included in their analysis.

In their tests of R&D facilities, the authors used as a test company a pharmaceutical R&D facility with 50 employees, \$4 million of capital investment and \$8 million in earnings. Testing that hypothetical company against the tax climate of Nebraska and its surrounding states, showed that, based solely on effective tax rates, Nebraska was the best choice for this company in comparison states for both 2012 and 2015, both as a new company and as a mature firm. Additionally, Nebraska was either the best or second best tax climate in the U.S. and three of the four simulations result in *negative* effective tax rates.

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<sup>10</sup> Items included in the calculation of total effective tax rate include: corporate income taxes, capital taxes, unemployment insurance taxes, sales taxes, property taxes, gross receipts taxes, other general business taxes, apportionment rules, income sourcing rules, tax exemptions and tax incentive programs.

If effective tax rates influence R&D investment or location decisions, these results suggest that Nebraska should have an advantage in the region and the U.S. as a whole. Comparisons are shown in Figures 2.2 and 2.3.

**Figure 2.2. New R&D Firm: State Total Effective Tax Rates (TETR) and Rankings**

State	2012 TETR	2012 National Rank	2015 TETR	2015 National Rank
Nebraska	-5.0%	2nd	-7.4%	2 <sup>nd</sup>
Kansas	25.4%	49th	8.9%	17 <sup>th</sup>
Iowa	21.5%	45th	10.7%	20 <sup>th</sup>
Wyoming	11.6%	16th	10.7%	22 <sup>nd</sup>
South Dakota	10.9%	14th	11.4%	25 <sup>th</sup>
Missouri	16.5%	28th	18.4%	44 <sup>th</sup>
Colorado	20.7%	40th	18.2%	43 <sup>rd</sup>

**Figure 2.3. Mature R&D Firm: State Total Effective Tax Rates (TETR) and Rankings**

State	2012 TETR	2012 National Rank	2015 TETR	2015 National Rank
Nebraska	6.3%	2nd	-2.3%	1 <sup>st</sup>
Wyoming	6.7%	3rd	6.2%	5 <sup>th</sup>
South Dakota	7.3%	4th	7.4%	7 <sup>th</sup>
Iowa	13.5%	28th	8.2%	13 <sup>th</sup>
Colorado	14.7%	36th	14.0%	38 <sup>th</sup>
Kansas	18.7%	46th	16.9%	47 <sup>th</sup>
Missouri	18.8%	47th	17.9%	49 <sup>th</sup>

Source for Figures 2.2 and 2.3: Audit Office compilation of data from Tax Foundation, *Location Matters: The State Tax Costs of Doing Business*, 2015.

### State Policy Comparisons

Of our six border states, Iowa, Kansas, and Colorado have research and development credit programs similar to Nebraska's. All three provide credit on a percentage of certain R&D expenditures, and the credit can be used to offset income taxes. Missouri's R&D tax credit expired in 2005. The two other border states, Wyoming and South Dakota, also do not have an R&D tax credit program, but do not have income tax either. Figure 2.4 lists each state program and the credit available.

At a glance, the 15% and 35% credits in Nebraska look like a larger benefit than the other states' R&D tax credits. However, since Nebraska's credit is a percentage of the federal credit awarded to the company, it is actually smaller than Iowa and Kansas.<sup>11</sup>

<sup>11</sup> The federal credit can be calculated in several ways, but as an example, using the regular calculation method, the federal credit is 20% of a company's qualified expenditures. Nebraska's basic credit is 15% of the resulting benefit. So Nebraska's effective R&D credit in this example is actually 3% of qualified expenditures, equal to Colorado's credit for increased research in Enterprise Zones. For this example, in

**Figure 2.4. State R&D Tax Credit Programs**

<b>State</b>	<b>Program</b>	<b>Credit</b>
<b>Iowa</b>	Research Activities Credit	6.5% of incremental research expenditures. Refundable.
<b>Kansas</b>	Research and Development Tax Credit	6.5% of incremental research expenditures. Non-refundable.
<b>Nebraska</b>	Nebraska Advantage Research and Development Credit	15% or 35% of federal research and experimentation credits earned in NE. Refundable.
<b>Colorado</b>	Enterprise Zone Research and Experimental Credit	3% of incremental research expenditures in an Enterprise Zone. Non-refundable.

Source: Audit Office analysis of state research and development credits.

### **Other Ways States Incentivize Research & Development**

State R&D tax credit programs are not the only efforts made by states to increase private R&D spending. A range of other policies and programs are provided by states that subsidize R&D. We provide the Figures 2.5 and 2.6 for policymakers' information. We do not use the information to make judgments about Nebraska's competitiveness, which is much more difficult to judge when considering the complex field of all grants, loans, and tax preferences offered by each state.

In Nebraska, there are at least nine state policies and programs beyond the Nebraska Advantage Research and Development Tax Credit that provide benefits for selected activities that include R&D but exclude others.

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order to match the rates seen in Iowa and Kansas, Nebraska's basic credit percentage would need to be 32.5%.

**Figure 2.5. Nebraska Programs with Research & Development Specific Qualifiers**

<b>Policy/Program</b>	<b>Method</b>	<b>Description</b>
<b>Business Innovation Act Programs (§§ 81-12,152 - 81-12,167)</b>	Appropriation (DED)	Grants for various innovation activities and assistance with federal programs
<b>Nebraska Agricultural Products Research Fund (§§ 81-1278 - 81-1280)</b>	Appropriation (DED)	Research and industrialization of new, additional, or improved uses of agricultural products
<b>Nebraska Litter Reduction and Recycling Fund (§ 81-1561)</b>	Appropriation (DEQ)	Grants for development of litter reduction, removal and disposal techniques and equipment
<b>Invest Nebraska programs – Through the Nebraska Operational Assistance Act (§§ 81-12,129 - 81-12,135)</b>	Loans/ Investments	Funding for high growth companies that create high wage jobs and attract out-of-state capital
<b>Local Option Municipal Economic Development Act (§§ 18-2701 - 18-2739)</b>	Local Expenditures	Authorizes local sales and property tax revenues to be used for economic development projects
<b>Angel Investment Tax Credit Act (§§ 77-6301 - 77-6310)</b>	Tax Code	Credit for 35% or 40% of qualified investment. Refundable.
<b>Nebraska Advantage Act (§§ 77-5701 - 77-5735)</b>	Tax Code	Certain R&D activities qualify for benefits, amount depends on tier and activity level. Non-refundable.
<b>Nebraska Advantage Rural Development Act (§§ 77-27,187 - 77-27,195)</b>	Tax Code	Certain R&D activities qualify for benefits, amount depends on agreement and activity level. Refundable.
<b>Sales tax exemption – Biochips (§ 77-2704.61)</b>	Tax Code	Exemption on biochips used for laboratory research

Source: Audit Office analysis of Nebraska statutes.

All of Nebraska’s neighbors provide some sort of state benefit that targets Research and Development that isn’t a specified R&D tax credit. Figure 2.6 contains examples of such benefits.

**Figure 2.6. Example State Programs with Research & Development Specific Qualifiers**

<b>State</b>	<b>Policy/Program</b>	<b>Method</b>	<b>Description</b>
<b>Iowa</b>	Supplemental Research Activities Tax Credit	Tax Code	Additional credit available for participants in various tax credit programs
	Demonstration Fund	Appropriation	Loans/royalty payments
	Research service facilities – property tax exemption	Tax Code	5- year value-added property tax exemption
<b>Missouri</b>	Missouri Works Program	Tax Code	Tax credits based on business activity (Similar to NAA)
	BUILD program	Appropriation	Loans/Tax exempt revenue bonds
	Sales tax exemption - Equipment	Tax Code	Exemption on machinery and equipment used in R&D
<b>Kansas</b>	Business and Job Development Credit	Tax Code	Tax credits based on business activity (Similar to NAA)
	Local option property tax exemption	Constitutional Authority	10 year exemption for property used for R&D
	Industrial Training/Retraining Program	Appropriation	Grants for workforce training.
<b>Colorado</b>	Advanced Industries Accelerator Program	Appropriation	Grants for product commercialization
	Sales tax exemption - Equipment	Tax Code	Exemption on equipment used for R&D in biotechnology, clean energy and medical devices.
<b>Wyoming</b>	SBIR/STTR Grants	Appropriation	Grants to assist companies participating in federal SBIR/STTR program
<b>South Dakota</b>	Reinvestment Repayment Program	Appropriation	Grant to offset costs of sales and use taxes
	Sales tax exemption – Research services	Tax Code	Exemption on research, development and testing services

Source: Audit Office analysis of state economic development programs.

# New to Nebraska

How many of the incentivized companies were new to Nebraska?

## Results

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Eleven (5%) of the 235 companies that claimed the Research and Development tax credit met our definition of a company that was new to the state.

There is no finding because there is no standard to compare the program data to in order to judge whether the number of new companies participating in the program meets policymakers' expectations.

Additionally, the small number of new companies is consistent with site selection research, which suggests that tax incentive programs are not among the most important factors influencing a company's location decisions.<sup>12</sup>

## Discussion/Methodology

This metric is one selected by the LR 444 (2014) Committee. As there is no statutory definition of "new to Nebraska," we defined "new" using a definition similar to the one used in our 2016 performance audit on the Nebraska Advantage Act.<sup>13</sup> A company that received an R&D credit is considered "new" to Nebraska if it started operating in the state in the two years prior to the year for which it first claimed R&D credit. Companies outside of this window are considered "established". We included companies that were a new company formation, or the first expansion of an out of state company in Nebraska. We did not include companies that were simply reorganized, renamed, or acquired by another entity.

This analysis shows the maximum number of companies that may have been attracted to the state because of the R&D credit. We cross-referenced the new to Nebraska results with our analysis of high-tech and/or renewable companies to see how many of the new companies were in those fields. However, the results could not be published due to confidentiality considerations.

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<sup>12</sup> Geraldine Gambale, "30th Annual Survey of Corporate Executives: Cautious Optimism Reflected," *Area Development Magazine*, Q1 2016. Factors in site selection found to be more important than state/local incentives were: availability of skilled labor, highway accessibility, quality of life, labor costs, occupancy or construction costs, available buildings, corporate tax rates, and proximity to major markets.

<sup>13</sup> In that audit, we looked back two years from the company's Advantage Act application date. Because the R&D program does not have an application process, there is no date that can identify when a company decided to participate. However, since the benefit is based on tax years, the first day of the first tax year for which the credit is earned was used as a start date.



# Private R&D Spending

Is the Act increasing private R&D spending in Nebraska?

## Results

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Business R&D spending in Nebraska has increased, but we make no finding on whether the Act impacted that increase. Statistical tests that could suggest whether the increase was potentially due to the Act, were inconclusive. Comparisons of Nebraska's spending trends before and after the Act, and of Nebraska's spending trends compared to U.S. trends were hampered by a lack of sufficient data as well as difficulty in sorting out the potential impact of the Great Recession.

There is no finding because we were unable to make comparisons with our selected standards.

## Discussion/Methodology

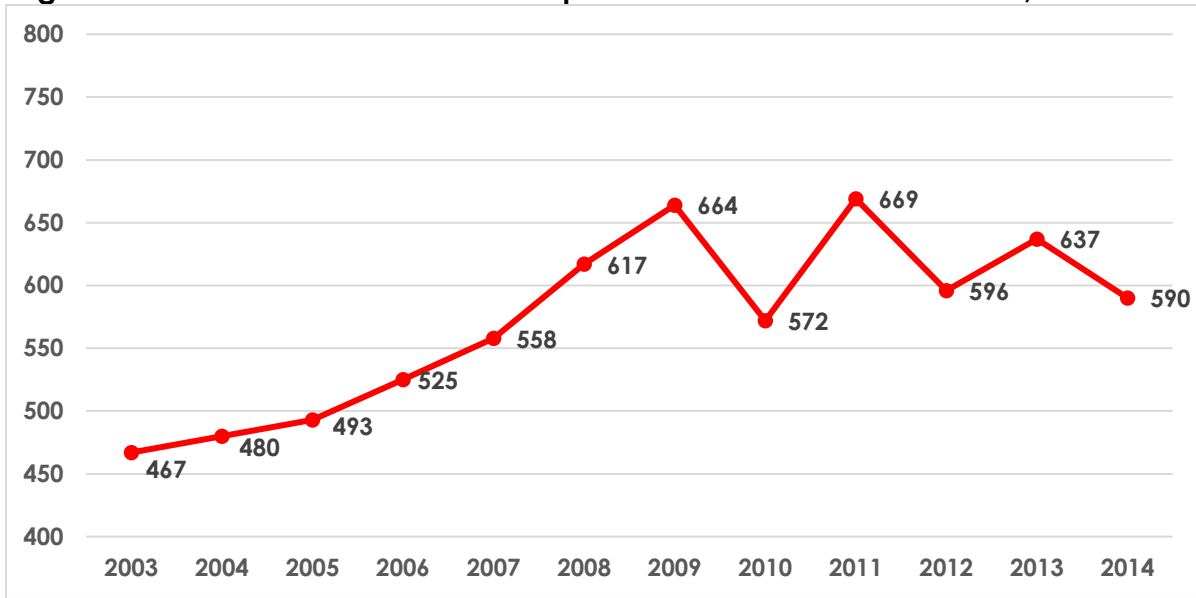
Proponents of the Research and Development Act, and subsequent amending legislation, said the Act would increase R&D expenditures in Nebraska. Information from the National Science Foundation's Business Research and Development and Innovation Surveys (BRDIS) was cited by proponents that showed Nebraska had \$447 million in business R&D expenses in 2006 (\$525 million in 2014 dollars), the first year the Act was in effect. We used BRDIS report statistics from 2003-2014, the most recent available, to examine trends in business R&D spending in Nebraska and the United States.

We reviewed program spending beginning with 2003, the earliest data available, and ending with 2014, the most recent data available. Adjusting for inflation, Nebraska's R&D spending increased from \$467 million in 2003 to \$590 million in 2014.<sup>14</sup> Spending increased from 2003 to 2009 and then rose and fell yearly until 2014. This can be seen in Figure 2.7.

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<sup>14</sup> Using the Bureau of Labor Statistics Consumer Price Index Inflation Calculator.

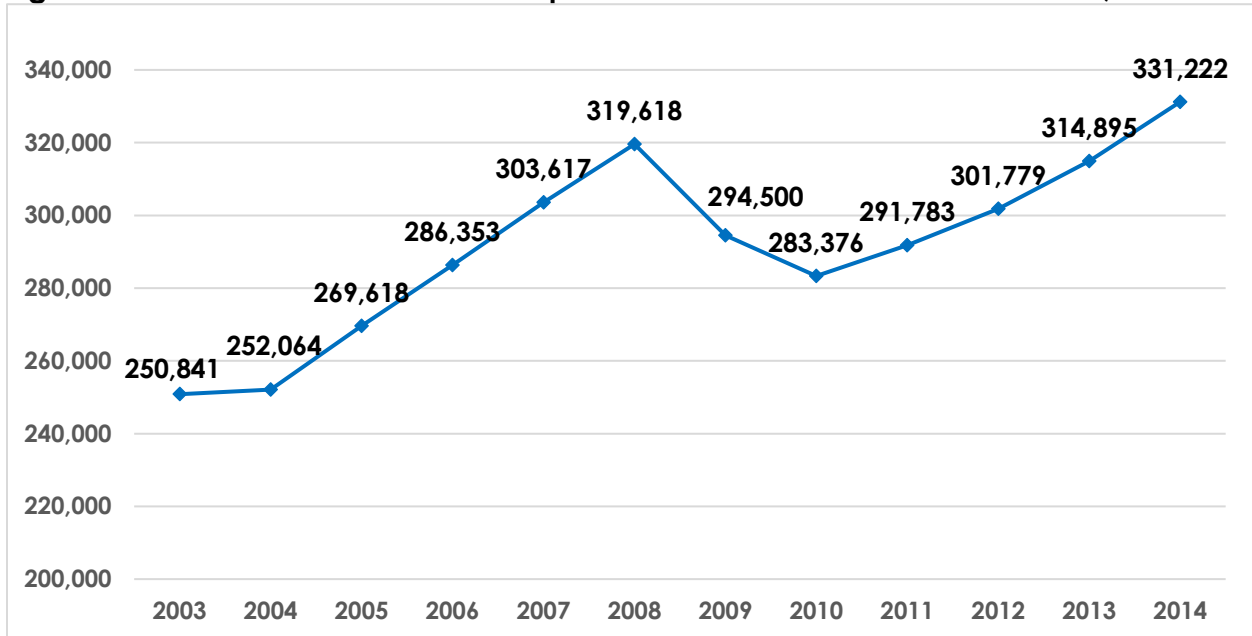
**Figure 2.7. Business Research & Development Performance in Nebraska, in Millions**



Source: Audit Office analysis of Business Research and Development and Innovation Survey data (2014 numbers, adjusted for inflation).

As shown in Figure 2.8, total business R&D spending in the U.S. also increased over the same time period.

**Figure 2.8. Business Research & Development Performance in the United States, in Millions**



Source: Audit Office analysis of Business Research and Development and Innovation Survey data (2014 numbers, adjusted for inflation).

We consulted University of Nebraska-Lincoln Statistics Professor Kent Eskridge to see if it was possible to determine: 1) whether the increase in funding in Nebraska after 2005 differed in a statistically significant way from the U.S. trends after 2005, and 2) whether the increase in Nebraska before the credit was in effect (2003 to 2005) was statistically different from the increase in the years after (2006 to 2014).

Unfortunately, given the available data, Professor Eskridge could not conclude whether the trends were statistically different for either question. The state's increase in funding was not significantly different from the U.S. trend which was likely due to the Great Recession having such a destabilizing effect on the economy that the periods before and after enactment of the R&D credit could not fairly be compared. Additionally, the BRDIS state data were only available from 2003, which meant data were available for only a very short period of two years prior to the credit's enactment. The lack of more years of data prior to the credit's enactment also contributed to the inability to detect significant before and after comparisons.

# R&D Comparisons

How does Nebraska's private R&D spending compare with surrounding states?

## Results

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In several comparisons to surrounding states, Nebraska ranks 5<sup>th</sup> out of seven states in metrics relevant to private R&D performance.

**Finding:** Nebraska's business Research and Development spending levels and rankings have not changed in a way that affects its relation to surrounding states since the R&D Act was enacted.

Proponents of the Act and subsequent amending legislation claimed the R&D Act would increase R&D expenditures in Nebraska. A National Science Foundation's Business Research and Development and Innovation Surveys (BRDIS) report was cited in the legislative history that showed Nebraska had \$447 million in business R&D expenses in 2006, the first year the Act was in effect.

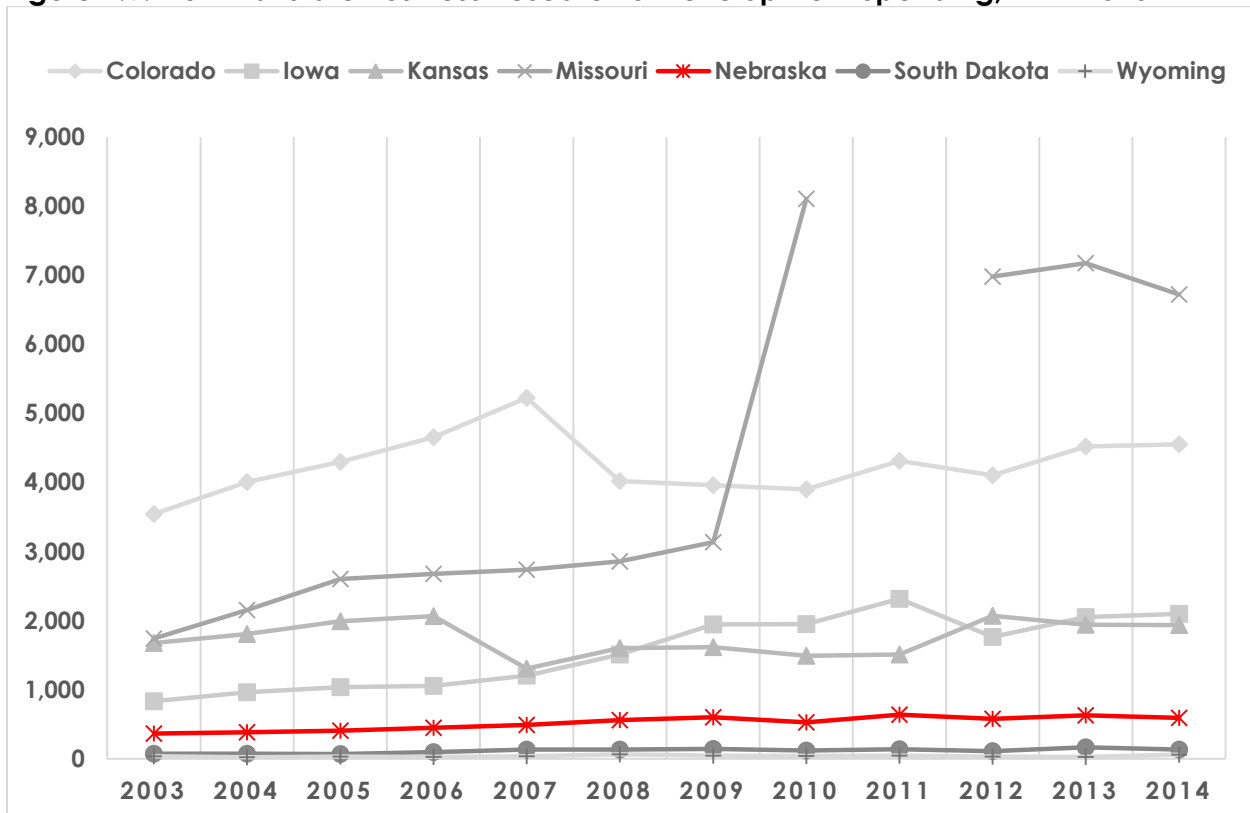
The Audit Office compared Nebraska's spending with surrounding states using BRDIS statistics from 2003-2014, as well as the National Science Foundation's 2016 Science and Engineering Indicators to compare trends. Both represent the most recent data available. We looked at Nebraska's R&D spending compared to other states in four ways: 1) how each state's spending has increased; 2) Nebraska's national ranking in R&D funding compared to the other states; 3) whether lower population states generally have lower R&D funding; and 4) how states compare on a statistic representing the relative size of a state's R&D spending to the it's private industry output.

## Discussion/Methodology

### State Private Research and Development Spending

The following chart shows how much private R&D spending (nominal, not adjusted for inflation) Nebraska and each surrounding state saw from 2003-2014. Nebraska's spending increased but its level of funding compared to other states' funding remained fairly consistent, as can be seen in Figure 2.9.

**Figure 2.9. Nominal State Business Research & Development Spending, in Millions**

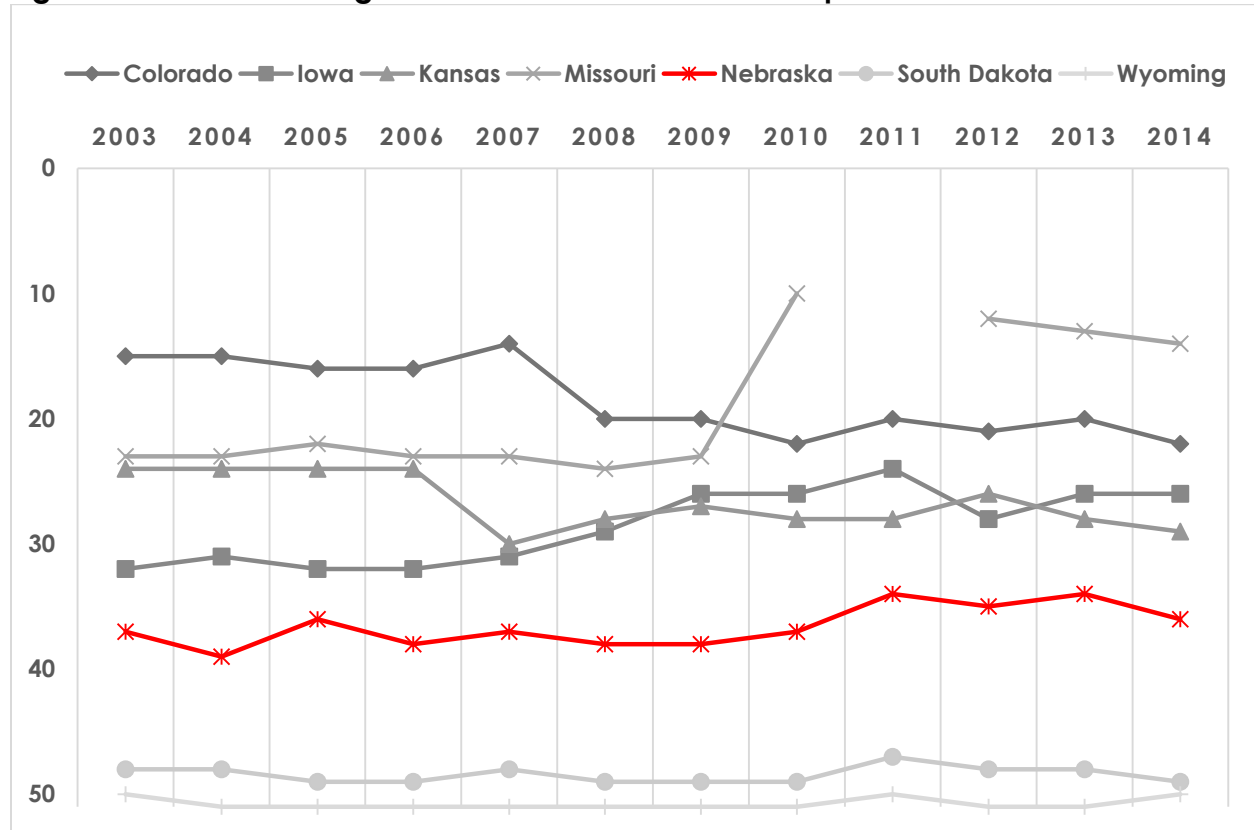


Source: Audit Office analysis of BRDIS data. Data not available for Missouri in 2011.

## Private Research and Development Spending: State Rankings

The next chart shows the each states' national ranking from 2003-2014, with 1 being the state with the highest private R&D spending, and 52 being the lowest (including Washington D.C. and Puerto Rico). Nebraska's ranking hovers around the upper- to mid-30s during that time period. As can be seen in Figure 2.10, at no time between 2003 and 2014 did Nebraska either surpass or fall behind a neighboring state in private R&D spending or ranking.

**Figure 2.10. State Rankings of Business Research & Development Performance**



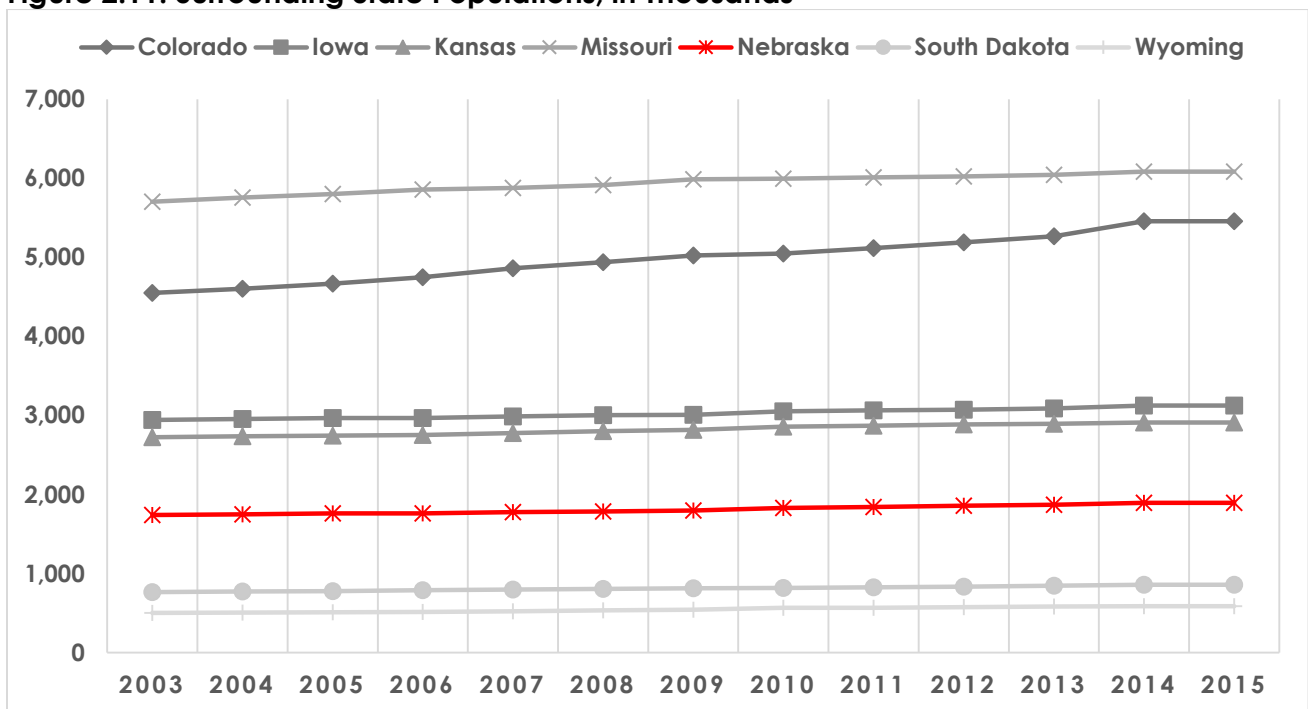
Source: Audit Office analysis of BRDIS data. Data not available for Missouri in 2011.

## State Population

Another factor that may impact the level of business R&D performance is the state’s population. When comparing state populations with state business R&D performance overall spending and rankings, similarities are evident—states with lower populations generally have lower R&D spending. Wyoming and South Dakota are at the bottom of all three analyses. Nebraska is third from the bottom in all three analyses. Kansas and Iowa are close in population, and, from 2007-2014, frequently trade places in the R&D rankings and spending. Populations are shown in Figure 2.11

Going against the trend, the population of Colorado has increased while R&D spending dropped between 2007 and 2008, and has yet to recover to 2007 levels. However, all three measures remain decidedly higher than Nebraska. When comparing population with R&D spending, Missouri is the most interesting case. It seems to underperform in R&D spending and ranking compared to its population until 2010, when the state makes a sudden jump in spending and increases their ranking from 23rd in spending to 10th.

**Figure 2.11. Surrounding State Populations, in Thousands**

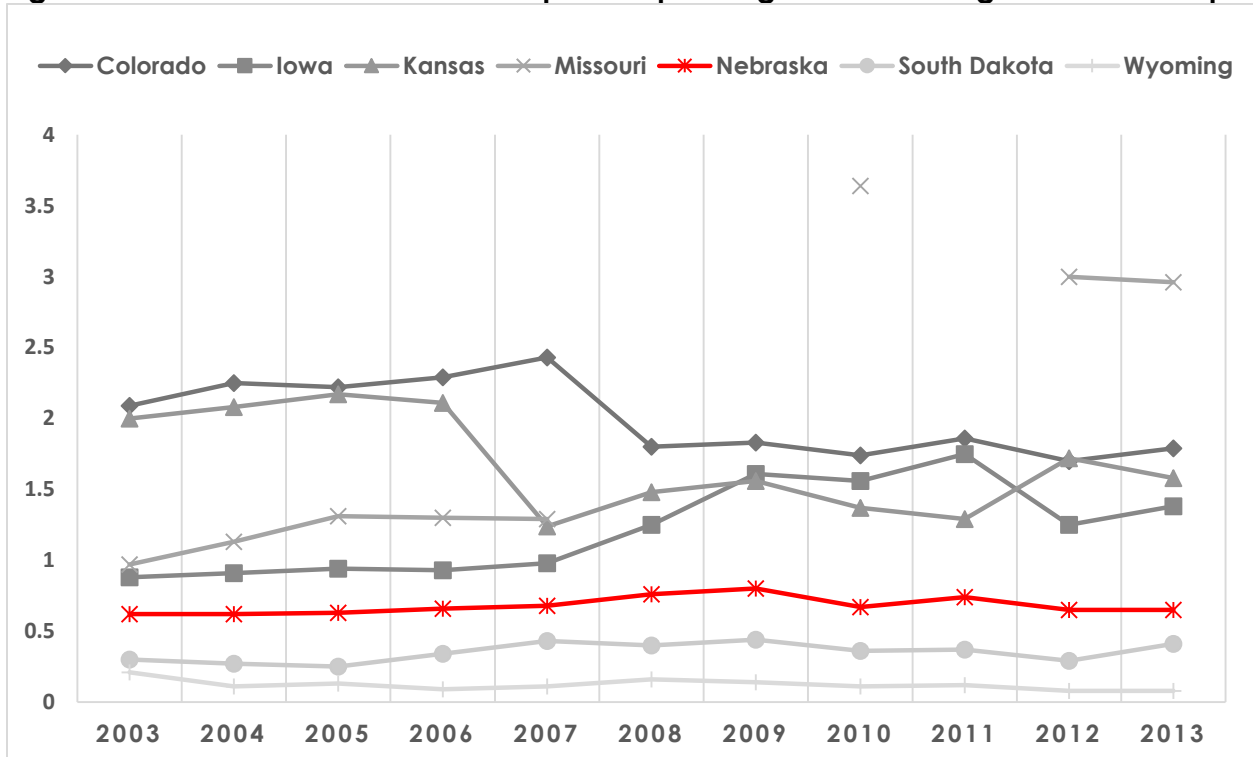


Source: Audit Office analysis of BRDIS data.

## State Spending on Research and Development Compared to Production

One final way to compare R&D spending between the states is by measuring private R&D intensity, as illustrated in Figure 2.12. This measure controls for population and the relative size of the states' economies by comparing R&D spending to the state's private industry output. In other words, the relative amount that businesses in the state spent on R&D as compared to their production. The resulting percentage is a state's private R&D intensity. Nebraska's private R&D intensity rises slightly from .62% in 2003 to .8% in 2009. It then lowers to .65% in 2013. At no point from 2003 to 2013 does Nebraska overtake or fall behind any surrounding state in intensity.

**Figure 2.12. Private Research & Development Spending as a Percentage of Private Output**



Source: Audit Office analysis of National Science Board data. Data was not available for Missouri for 2008, 2009, and 2011.



The intensity data can be averaged and ranked for the period since Nebraska’s R&D tax credit has been in effect. The results of this analysis show similar rankings to the other comparisons (Figure 2.13). Missouri and Colorado lead the group, with Kansas and Iowa below and near each other, Nebraska clearly in the fifth spot, and South Dakota and Wyoming at the bottom. In the national ranking for average private R&D spending intensity for the period for which the R&D Act was in effect (2006-2013), Nebraska was 37th, with an average intensity of .7%. The U.S. as a whole had an average of 2.19%, and the leading state in the nation was Massachusetts with an average of 4.6%.

**Figure 2.13. State Average Research & Development Spending as a Percentage of Output, 2006-2013**

<b>State</b>	<b>Average R&amp;D Spending as Percentage</b>	<b>National Rank of Average Spending</b>
<b>Missouri</b>	2.44%	11th
<b>Colorado</b>	1.93%	16th
<b>Kansas</b>	1.54%	24th
<b>Iowa</b>	1.34%	27th
<b>Nebraska</b>	0.70%	37th
<b>South Dakota</b>	0.38%	47th
<b>Wyoming</b>	0.11%	51st

Source: Audit Office analysis of National Science Foundation data.

# High-tech Sector

Is the Act stimulating high-tech firms in the state?

## Results

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Using our definition of “high-tech” industries, Nebraska’s high-tech sector has not recovered to its 2001 employment levels and has not kept pace with the U.S. as a whole in the evaluation years. Sixty-four companies in high-tech industries were awarded \$10.6 million in R&D credits from 2006-2015.

There is no finding because there is no standard to compare the program data to in order to judge whether the amount is enough to meet policymakers’ expectations. While Nebraska is not keeping pace with national trend, it is possible Nebraska’s employment in this sector would have been worse without the program.

Research suggests that the more a tax incentive reduces business costs, the more effective it is in influencing business decisions.<sup>15</sup> The relatively small amount of funds the R&D program injects into the high-tech sector is unlikely to have much effect on sector-level or industry specific employment. However, an analysis using economic modeling may be needed to validate this reasoning.

## Discussion

### Defining High-tech Industries

The R&D Act does not define a “high-tech” company and we did not find a useable definition in other tax incentive statutes.<sup>16</sup> Academic definitions vary as well but we used one highlighted in a study that comprehensively reviewed the research on various definitions. That definition is that a high-technology industry is one with a proportion of Science, Technology, Engineering, and Math (STEM) workers at least five times the average as found in examinations of the economy in 2005, 2012, and 2014.<sup>17</sup>

This definition captures 15 industries at the North American Industry Classification System (NAICS) 4-digit classification level, listed on the following page.

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<sup>15</sup> The Pew Charitable Trusts, *How to Measure the Results of Tax Incentives: Promising Practices and a Proposal for Nebraska*, p. 17.

<sup>16</sup> There is a statutory definition of a “high technology field” which is found in the Angel Investment Tax Credit Act (§ 77-6302(6)). However, for a variety of reasons, it was not useable for this report.

<sup>17</sup> Center for Economic Studies, “Business Dynamics Statistics of High Tech Industries.” The purpose of the discussion paper was to advance a definition for the U.S. Census Bureau for use in their Business Dynamics Statistics data and reports.

### NAICS High-tech Industries

- 2111 - Oil and Gas Extraction
- 3254 - Pharmaceutical and Medicine Manufacturing
- 3341 - Computer and Peripheral Equipment Manufacturing
- 3342 - Communications Equipment Manufacturing
- 3344 - Semiconductor and Other Electronic Component Manufacturing
- 3345 - Navigational, Measuring, Electromedical, and Control Instruments Manufacturing
- 3364 - Aerospace Product and Parts Manufacturing
- 5112 - Software Publishers
- 5171 - Wired Telecommunications Centers<sup>18</sup>
- 5179 - Other Telecommunications
- 5182 - Data Processing, Hosting, and Related Services
- 5191 - Other Information Services
- 5413 - Architectural, Engineering, and Related Services
- 5415 - Computer Systems Design and Related Systems
- 5417 - Scientific Research and Development Services

### **Research and Development Act Benefits to High-tech Companies**

The Audit Office used information from the Department of Revenue and the Department of Labor to identify companies that received benefits from the Act and also had a high-tech NAICS code. As shown in Figure 2.14, between 2007 and 2015, 64 companies were awarded \$10,699,270 in benefits. (No benefits were awarded in the first year of the Act.)

**Figure 2.14. Amount of Research & Development Act Benefits Awarded to High-tech Companies**

	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Companies</b>	3	11	15	22	22	23	29	39	39
<b>Dollar Amount Awarded</b>	2,264	1,056,173	932,157	2,594,039	805,410	1,769,215	224,645	1,240,553	2,074,814

Source: Audit Office analysis of Department of Revenue data.

### **Nebraska's Performance in the High-tech Sector**

The Audit Office used the NAICS codes listed above to examine Nebraska's high-tech sector using three separate methods, each of which provides a different look at how the sector has performed in the time since the Act was passed. All three were performed using Bureau of Labor Statistics data from the Quarterly Census of Employment and Wages.

<sup>18</sup> In the 2017 NAICS reclassification revisions, this industry was renumbered as 5173.

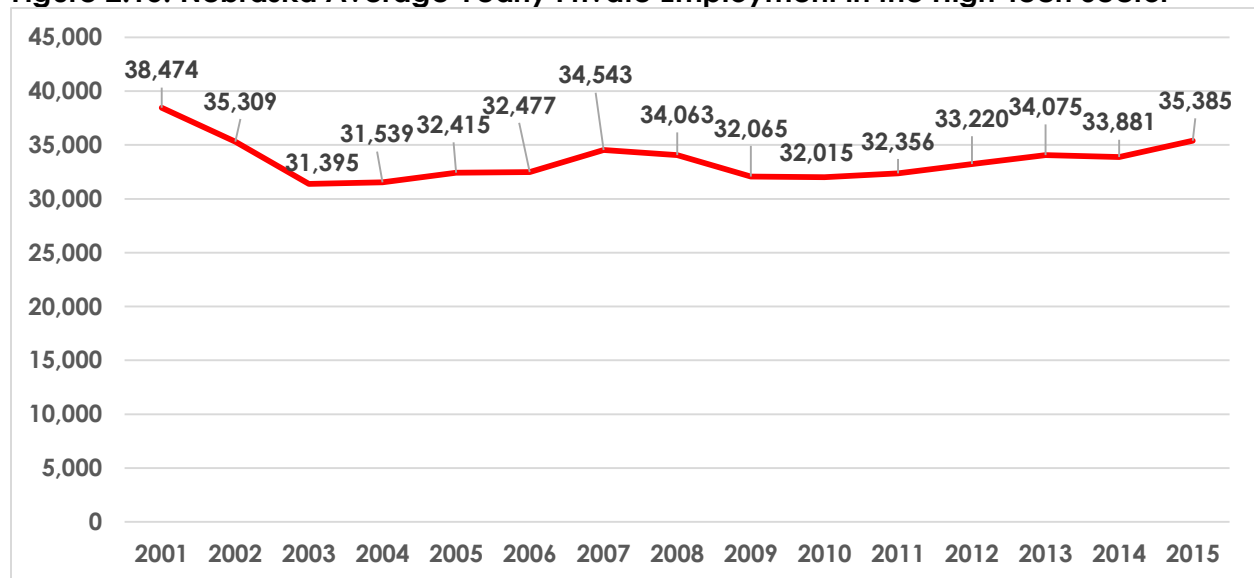
In summary, these analyses showed that in 2015:

- high-tech jobs had increased in Nebraska but were not back to the 2001 level;
- the proportion of high-tech jobs in the Nebraska economy remained fairly consistent;
- the proportion of these jobs in the Nebraska economy dropped in comparison to the U.S. economy.
- the industry with the most growth in Nebraska due to local conditions was Other Information Services, (NAICS 5191), which includes Internet based activities like publishing, broadcasting, search portals, and many others; and
- the industry that lost the most jobs in Nebraska due to local conditions was Data Processing, Hosting, and Related Services (NAICS 5182), which includes activities like data storage, non-financial data processing, streaming services, web hosting, and others.

### *Annual Employment Levels*

First, we reviewed the average yearly employment in the 15 identified industries for the four years prior to the program’s creation through 2015. As shown in Figure 2.15, the average yearly total employment level in Nebraska’s high-tech sector dips from 2001 to 2003, and then slightly increases fairly steadily to 2015, however, by 2015, employment had not recovered to 2001 levels in any year.

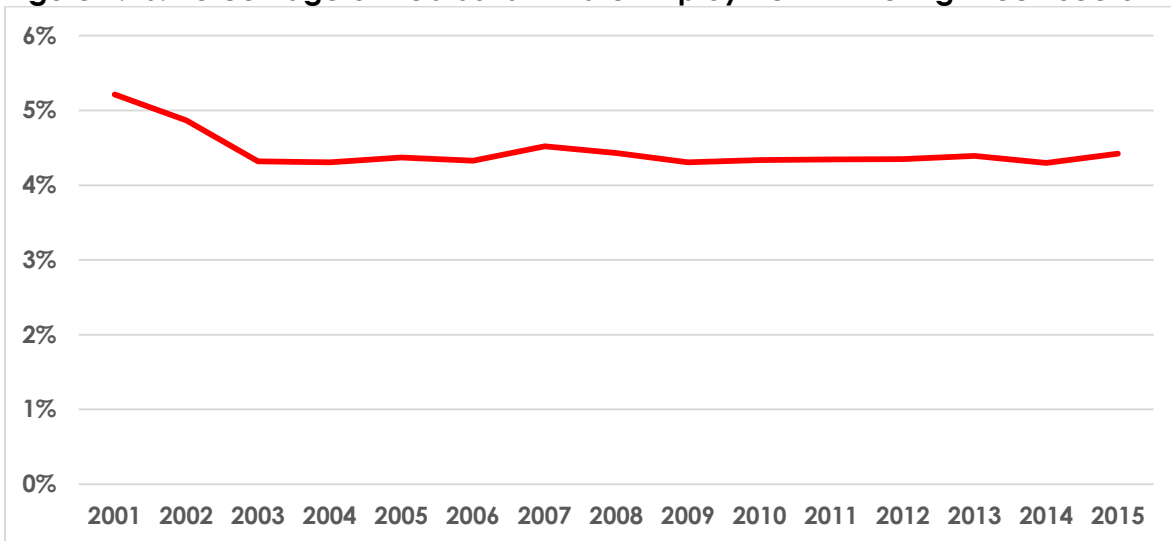
**Figure 2.15. Nebraska Average Yearly Private Employment in the High-tech Sector**



Source: Audit Office analysis of Bureau of Labor Statistics data.

As shown in Figure 2.16, this analysis also shows a decrease in the percentage of employment in high-tech industries as part of the Nebraska economy from 2001-2003. However, unlike the average employment levels shown previously, the high-tech employment percentage does not increase thereafter, starting at 4.38% in 2003 and ending at 4.43% in 2015. From 2003-2015, the proportion of jobs in Nebraska’s high-tech sector relative to the state as a whole remained constant.

**Figure 2.16. Percentage of Nebraska Private Employment in the High-tech Sector**



Source: Audit Office analysis of Bureau of Labor Statistics data.

*Nebraska High-tech Growth Compared to U.S. High-tech Growth*

To determine whether the growth in Nebraska’s high-tech industry sectors was weaker than, equivalent to, or stronger than high-tech growth at the national level, we performed a location quotient analysis for the year before the Act began (2005) and the most recent year data was available (2015). This analysis showed that Nebraska’s high-tech industries’ location quotient decreased from .78 in 2005 to .70 in 2015. In other words, in 2005, Nebraska’s high-tech employment was 78% of the national employment average and in 2015 it was 70%. In order for the high-tech sector to have been on par with the U.S. as a whole, it would have needed an estimated 9,001 additional jobs in 2005, and 14,976 additional jobs in 2015.

So while high-tech employment in that period grew slightly in Nebraska as seen in Figure 2.17, the location quotient analysis shows that Nebraska’s high-tech growth is not maintaining pace with U.S. overall.

**Figure 2.17. Proportion of High-tech Employment in Nebraska Compared to U.S.**

	2005	2015
<b>Nebraska High-tech Employment Percentage</b>	4.38%	4.43%
<b>U.S. High-tech Employment Percentage</b>	5.65%	6.33%
<b>Nebraska-U.S. Location Quotient</b>	78%	70%
<b>Jobs Nebraska Needed to Match U.S.</b>	9,001	14,976

Source: Audit office analysis of Bureau of Labor Statistics data.

## *National, Industry, and Local Factors*

To estimate how much employment change in high-tech industries in a given period is due to national economic growth, national industry-specific growth, and unique regional conditions, we performed a shift-share analysis. This analysis showed that in 13 of the 15 high-tech industries,<sup>19</sup> jobs increased by 3,027 between the year before the Act began (2005), and the latest year that data was available (2015). Of those 3,027 jobs, the analysis attributed:

- 2,219 jobs to the general growth of the national economy, and
- 4,179 jobs to the national growth in the high-tech sector.

However, the analysis also showed that there was *negative* growth of 3,370 jobs due to local conditions. This means that Nebraska would have had 3,370 more jobs in high-tech industries if those jobs had grown at the same pace in Nebraska as national and industry employment trends during the evaluation period.

The shift-share analysis can also highlight differences between industry groups. For example, Nebraska's greatest positive regional shift in the high-tech sector occurred in Other Information Services (NAICS 5191), in which local conditions accounted for 818 additional jobs. This includes Internet based activities like publishing, broadcasting, search portals and many others. From 2005-2015, this is the industry in which Nebraska was the most competitive within the high-tech sector.

In contrast, the greatest negative regional shift occurred in Data Processing, Hosting, and Related Services (NAICS 5182), in which local conditions accounted for 2,191 fewer jobs. This includes activities like data storage, non-financial data processing, streaming services, web hosting, and others. From 2005-2015, this is the industry in which Nebraska was the least competitive within the high-tech sector.

## **Methodology**

The only statutory definition of a "high-tech" industry is found in the Angel Investment Act. Neb. Rev. Stat. § 77-6302(7), which states:

Qualified high-technology field includes, but is not limited to, aerospace, agricultural processing, renewable energy, energy efficiency and conservation, environmental engineering, food technology, cellulosic ethanol, information technology, materials science technology, nanotechnology, telecommunications, biosolutions, medical device products, pharmaceuticals, diagnostics, biologicals, chemistry, veterinary science, and similar fields...

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<sup>19</sup> Two industries did not have enough presence in Nebraska to protect company confidentiality in reporting. These were not included in the BLS data.

This definition was not usable for this evaluation. A list of qualified fields is included, however, it does not follow NAICS code classifications and therefore cannot be examined using common Census Bureau or Bureau of Labor Statistics data. This definition also does not limit the fields to what is listed, potentially omitting industries or activities and allowing room for subjective interpretation. This may be a benefit for administering the Act, but it is insufficient guidance for the purpose of this evaluation.

### **Location Quotient of Employment**

A location quotient is found using total employment in the region to be analyzed, total employment in the U.S., sector level employment in the region, and sector level employment in the U.S.

First, the Nebraska economy's high-tech employment percentage is found. Then the high-tech employment percentage is found for the U.S. The U.S. percentage is divided by the Nebraska percentage to find the location quotient.

A result of 1 would mean that the segment of the state is the same relative size as it is in the U.S. as a whole. A result of 2 would mean that the state has twice as much relative employment in the segment than the U.S, and a result of .2 would mean that the state has 20% of the amount of employment relative to the U.S.

The difference in expected employment is found by first finding the U.S. high-tech percentage of the Nebraska employment total, giving us the total jobs that would be expected if Nebraska's economy had the same ratio of high-tech jobs as the U.S. We then take the actual number of Nebraska high-tech jobs and subtract them.

Location quotient calculations can be found in Appendix A.

### **Shift-share Analysis**

Two years are selected for comparison and data on employment levels for the total national economy, the total regional economy, and within the industry at national and regional levels is analyzed. Using a spreadsheet, each industry's employment is compared to national and regional trends with three formulas that find the amount that can be attributed to federal, industry, and regional trends.

Complete shift-share calculations can be found in Appendix B.

# Renewable Energy Sector

Is the Act stimulating renewable energy firms in the state?

## Results

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Using our definition of “renewable energy” industries, Nebraska’s renewable energy sector has gained strength during the evaluation years. Although the sector has been growing, both in absolute employment capacity and in relative terms compared to the U.S., it is still behind the U.S. as a whole. Nineteen companies in the renewable energy sector were awarded \$1,119,947 in R&D credits from 2006-2015.

There is no finding because there is no standard to compare the program data to in order to judge whether the amount is enough to meet policymakers’ expectations. While Nebraska is not keeping pace with national trend, it is possible Nebraska’s employment in this sector would have been worse without the R&D program.

Research suggests that the more that a tax incentive reduces business costs, the more effective it is in influencing business decisions.<sup>20</sup> The relatively small amount of funds the program injects into the renewable energy sector is unlikely to have much effect on sector-level or industry specific employment. However, an analysis using economic modeling may be needed to validate this reasoning.

## Discussion

### Defining Renewable Energy Industries

The R&D Act does not define what is meant by a “renewable energy” firm, and there is no clear definition in statute. In the absence of a clear statutory definition, we use a definition that was used by the Bureau of Labor Statistics (BLS). BLS developed a list of industries that are involved in the production of renewable energy for its Green Goods and Services program.

The list of 60 industries at the 6-digit NAICS code level, which can be found on the following page, includes energy generation companies as well as companies that support them, such as farms for biomass inputs, turbine and turbine generator manufacturing, and environmental consulting services.

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<sup>20</sup> The Pew Charitable Trusts, *How to Measure the Results of Tax Incentives: Promising Practices and a Proposal for Nebraska*, p. 17.



## NAICS Renewable Energy Industries

111110 - Soybean farming	221330 - Steam and air-conditioning supply
111120 - Oilseed, except soybean, farming	237130 - Power & communication system constr
111130 - Dry pea and bean farming	237210 - Land subdivision
111140 - Wheat farming	237990 - Other heavy construction
111150 - Corn farming	325193 - Ethyl alcohol manufacturing
111160 - Rice farming	325199 - All other basic organic chemical mfg.
111191 - Oilseed and grain combination farming	331512 - Steel investment foundries
111199 - All other grain farming	331513 - Steel foundries, except investment
111211 - Potato farming	331523 - Nonferrous metal die-casting foundries
111219 - Other vegetable and melon farming	331524 - Aluminum foundries, except die-casting
111310 - Orange groves	331529 - Other nonferrous foundries, exc die-casting
111320 - Citrus, except orange, groves	332111 - Iron and steel forging
111331 - Apple orchards	332112 - Nonferrous forging
111332 - Grape vineyards	333414 - Heating equipment, exc warm air furnaces
111333 - Strawberry farming	333415 - AC, refrigeration, and forced air heating
111334 - Berry, except strawberry, farming	333511 - Industrial mold manufacturing
111335 - Tree nut farming	333611 - Turbine and turbine generator set units mfg.
111336 - Fruit and tree nut combination farming	333612 - Speed changer, drive, and gear mfg.
111339 - Other noncitrus fruit farming	333613 - Mech power transmission equipment mfg.
111411 - Mushroom production	334519 - Other measuring & controlling device mfg.
111419 - Other food crops grown under cover	485510 - Charter bus industry
111930 - Sugarcane farming	541330 - Engineering services
111991 - Sugar beet farming	541360 - Geophysical surveying & mapping services
113310 - Logging	541370 - Other surveying and mapping services
221111 - Hydroelectric power generation	541620 - Environmental consulting services
221114 - Solar electric power generation	541690 - Other technical consulting services
221115 - Wind electric power generation	541711 - Research & development in biotechnology
221116 - Geothermal electric power generation	541712 - Other physical and biological research
221117 - Biomass electric power generation	561730 - Landscaping services
221118 - Other electric power generation	562213 - Solid waste combustors & incinerator

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When these industry classifications are used for renewable energy sector analysis, it must be kept in mind that not all firms in these industries are producing outputs related to renewable energy production at all times. For example, corn can be grown for human consumption, cattle feed, ethanol production, and other uses. This list includes corn farming because it has the potential to be used for renewable energy production. Therefore, the results of employment analyses derived from this list must always be thought of as a *maximum capacity for employment* in the renewable energy sector.

## Methodology

### Research and Development Benefits to Renewable Energy Companies

The Audit Office used information from the Department of Revenue and the Department of Labor to identify companies that received benefits from the Act and also had a renewable energy NAICS code. There were 19 companies that were awarded \$1,119,497 in benefits between 2007 and 2015, as shown in Figure 2.18. No benefits were awarded in the first year of the Act.

**Figure 2.18. Research & Development Benefits to Renewable Energy Companies**

	2007-2009*	2010	2011	2012-2013*	2014	2015
<b>Number of Companies</b>	4	4	6	8	10	12
<b>Dollar Amount Awarded</b>	167,311	73,609	109,971	313,428	183,797	272,551

Source: Audit Office analysis of Department of Revenue and Department of Labor data.

\*These years were combined to protect taxpayer confidentiality.

### Nebraska's Performance in the Renewable Energy Sector

The Audit Office used the NAICS codes listed previously to examine Nebraska's renewable energy sector using three separate methods, each of which method provides a different look at how the sector has performed in the time since the Act was passed. All three were performed using BLS data from the Quarterly Census of Employment and Wages. In summary, these analyses showed that in 2015:

- The renewable energy sector had almost continuous growth since 2001;
- The proportion of renewable energy jobs in the Nebraska economy increased;
- The proportion of these jobs in the Nebraska economy increased compared to the growth in the U.S. economy;
- The industry with the most growth in Nebraska due to local conditions was Oilseed and Grain Farming (NAICS 111100); and
- The industry that lost the most jobs in Nebraska due to local conditions was Scientific Research and Development Services (NAICS 541710<sup>21</sup>), which includes R&D in physical, engineering and life sciences as well as biotechnology.

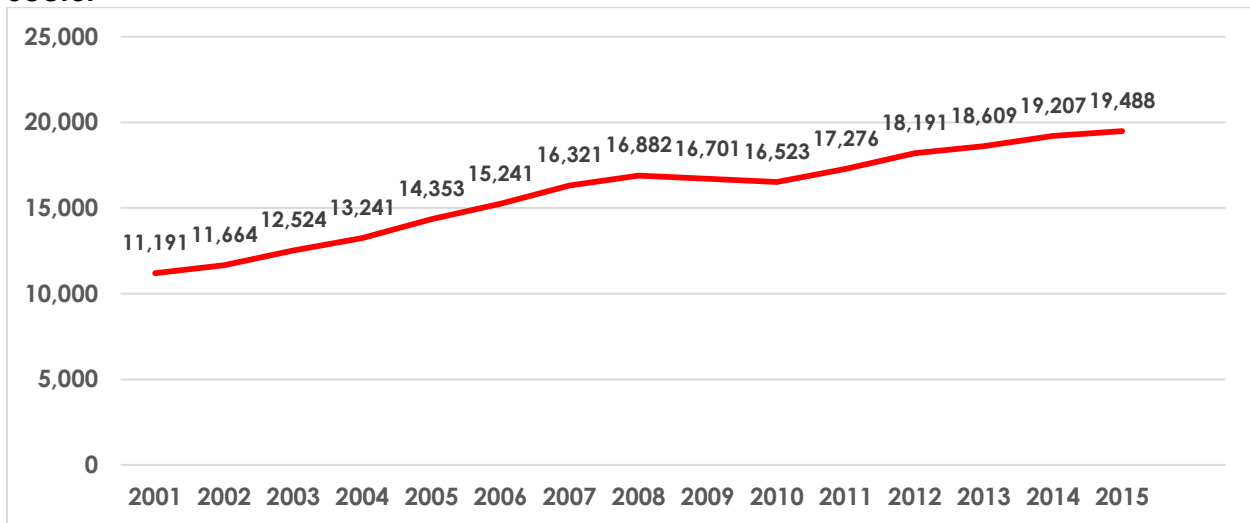
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<sup>21</sup> Beginning in 2007, NAICS split 541710 into two separate codes, 541711 and 541712. For ease of comparing the two years on either side of the split, we combined the two new codes for 2015 data.

### Annual Employment Levels

First, we reviewed the average yearly employment in the 60 identified industries for the four years prior to the program’s creation through 2015. As shown in Figure 2.19, with the exception of a leveling off in 2008-2010, the average yearly employment level in the renewable energy sector rises steadily throughout the examination period.

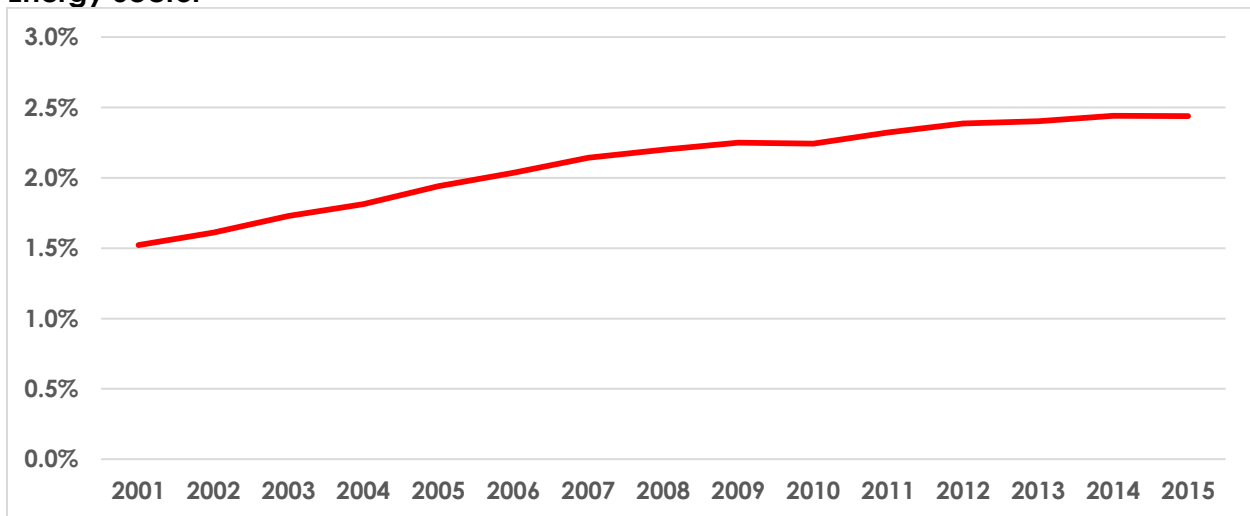
**Figure 2.19. Nebraska Average Yearly Private Employment in the Renewable Energy Sector**



Source: Audit Office analysis of Bureau of Labor Statistics data.

As shown in Figure 2.20, this analysis also shows an increase in the percentage of employment in renewable energy industries from 2001-2015. Starting at 1.52% in 2001, the percentage grows to 2.44% in both 2014 and 2015. During the examination period, the renewable energy sector grew as a proportion of all Nebraska private employment.

**Figure 2.20. Percentage of Total Nebraska Average Private Employment in the Renewable Energy Sector**



Source: Audit Office analysis of Bureau of Labor Statistics data.

## Nebraska Renewable Energy Growth Compared to U.S. Renewable Energy Growth

To determine whether the growth in Nebraska's renewable energy industry sectors was weaker than, equivalent to, or stronger than energy sector growth at the national level, we performed a location quotient analysis. This analysis showed that Nebraska's renewable energy location quotient increased from .63 in 2005 to .76 in 2015, meaning that Nebraska's renewable energy employment capacity was 63% of what national employment would have predicted in 2005, and 76% in 2015. In order for the renewable energy sector to have been on par with the U.S. as a whole, it would have needed an estimated 8,482 additional jobs in 2005, and 6,180 additional jobs in 2015.

Nebraska's renewable energy employment potential has improved in comparison to the U.S., however, it has not yet met U.S. levels (Figure 2.21).

**Figure 2.21: Proportion of Renewable Energy Employment in Nebraska Compared to U.S.**

	2005	2015
<b>Nebraska Renewable Energy Employment Percentage</b>	1.94%	2.44%
<b>U.S. Renewable Energy Employment Percentage</b>	3.09%	3.21%
<b>Nebraska-U.S. Location Quotient</b>	63%	76%
<b>Jobs Nebraska Needed to Match U.S.</b>	8,482	6,180

Source: Audit Office analysis of Bureau of Labor Statistics data.

### *National, Industry, and Local Factors*

To estimate how much employment change in renewable energy industries in a given period is due to national economic growth, national industry-specific growth, and unique regional conditions we performed a shift-share analysis. Our analysis showed that in 41 of the 60 renewable energy industries,<sup>22</sup> Nebraska's potential renewable energy employment grew by 5135 jobs between 2005 and 2015. Of those jobs:

- 999 were due to growth in the national economy as a whole,
- 989 due to growth in the national renewable energy Sector, and
- 3148 were due to local conditions. This means that local conditions in Nebraska's economy accounted for more than half of its job growth in the sector between 2005 and 2015.

The shift share analysis can also highlight differences between industry groups. For example, Nebraska's greatest positive regional shift is found in Oilseed and Grain Farming (NAICS 111100) with 787 additional jobs due to local conditions. From 2005-2015, this is the industry in which Nebraska was most competitive in the renewable energy sector. Although Ethyl Alcohol Manufacturing (NAICS 325193) accounts for a large number of increased jobs, 853 are due to growth of the nationwide industry and 305 are due to economic conditions in Nebraska.

<sup>22</sup> Several industries did not have enough presence in Nebraska to protect company confidentiality in reporting. These were not included in the BLS data.

The largest negative regional shift occurred in Scientific Research and Development Services (NAICS 541710<sup>23</sup>), which includes R&D in physical, engineering, and life sciences as well as biotechnology. Nebraska saw 364 fewer jobs in this sector than would have been anticipated if the state had kept up with national and industry trends. Of the 55 sectors examined, this is the industry in which Nebraska was least competitive.

### **Location Quotient of Employment**

A location quotient is found using employment in the region to be analyzed, employment in the U.S., sector level employment in the region, and sector level employment in the U.S.

First, the Nebraska economy's renewable energy employment percentage is found. Then the renewable energy employment percentage is found for the U.S. The U.S. percentage is divided by the Nebraska percentage to find the location quotient.

A result of 1 would mean that the segment of the state is the same relative size as it is in the U.S. as a whole. A result of 2 would mean that the state has twice as much relative employment in the segment than the U.S, and a result of .2 would mean that the state has 20% of the amount of employment relative to the U.S.

The difference in employment is found by first finding the U.S. renewable percentage of the Nebraska employment total, giving us the total jobs that would be expected if Nebraska's economy had the same ratio of renewable energy jobs as the U.S. We then take the actual number of Nebraska renewable energy jobs and subtract them.

Location quotient calculations can be found in Appendix A.

### **Shift-share Analysis**

Two years are selected for comparison and data on employment levels for the total national economy, the total regional economy, and within the industry at national and regional levels is analyzed. Using a spreadsheet, each industry's employment is compared to national and regional trends with three formulas that find the amount that can be attributed to federal, industry, and regional trends.

Complete shift-share calculations can be found in Appendix C.

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<sup>23</sup> Beginning in 2007, NAICS split 541710 into two separate codes, 541711 and 541712. For ease of comparing the two years on either side of the split, we combined the two new codes for 2015 data.

# Brain Drain

Has the Act affected brain drain in Nebraska?

## Results

It is difficult to determine the extent of brain drain (the net number of highly educated people moving out of Nebraska), but the best estimates by the Nebraska Coordinating Commission for Postsecondary Education indicate that it is occurring. It is also difficult to determine what role the R&D program plays in retaining highly educated people in the state.

There is no finding about the program performance because there is no standard to compare the program data to in order to judge whether the amount of the increase is enough to meet policymakers' expectations.

A sample logic chain included in this section demonstrates how policymakers might identify specifically how R&D spending may be impacting brain drain.

**Finding:** Future evaluations may be improved if policymakers use a logic chain or other method of clearly identifying the factors they believe connect Research and Development spending to brain drain.

## Discussion

### Brain Drain in Nebraska

“Brain drain” refers to highly educated individuals leaving the state. In 2009, the Legislature amended the R&D Act to provide additional credit to companies that made qualified expenditures on the campus of, or at a facility owned by, a college or university. The bill’s introducer stated that one reason for the change was because, “We have faced, as a people, a long-term drain of our youngest and our brightest. Increasingly, the cost of education weighs on our budget and increasingly, the very fine and educated young people we produce leave the state.”<sup>24</sup>

Brain drain was a concern for the Legislature even before the R&D Act was amended. In 2003, a legislative task force identified “reducing, eliminating, and then reversing the net out-migration of Nebraskans with high levels of educational attainment” as a priority to be addressed.<sup>25</sup> LB 962 (2006) included that priority, among others, as a Legislative Finding, and requires Nebraska’s Coordinating Commission for Postsecondary Education (Coordinating Commission) to issue progress reports on those priorities.

<sup>24</sup> Nebraska Legislature, Revenue Committee, *LB 555 (2009) Transcript*, remarks by Senator Tom White, February, 18, 2009.

<sup>25</sup> Coordinating Commission for Postsecondary Education, *Challenges and Opportunities: 2004 Baseline Report for LR 174 Higher Education Task Force*, December 9, 2004. p. 15

## Methodology

There is no single way to precisely measure the number of people leaving the state who would be considered part of the brain drain. Current best estimates by the Coordinating Commission and the University of Nebraska-Omaha Center for Public Affairs suggest that, compared to the overall population of highly educated people in Nebraska, average annual net migration loss is small, as discussed in more detail below. However, the authors of the 2017 report also state that, "...repeated positive or negative net migration will have a corresponding positive or negative effect on the size and quality of the state's labor force over the long run."<sup>26</sup>

While the Census Bureau's American Community Survey (ACS) compiles annual estimates of out-migration data, the Coordinating Commission urges caution in interpreting this data because it is collected from small samples, which may lead to imprecise conclusions. To limit some of the problems with the single-year data, the Commission used reported five-year ACS data.

Based on the five-year ACS data, the Coordinating Commission reported Nebraska's overall percentage of highly educated people (defined as those age 22-64 with a Bachelor's or higher degree) increased to 29.8% from 2006 to 2010, and to 31.7% from 2011 to 2015. These figures suggest the state had a slightly larger pool of highly educated people in the more recent period.

In contrast, however, the average number of people who completed degree programs in Nebraska decreased from 2011 to 2015. Finally, the average annual out-migration of highly educated people increased between 2011 and 2015, suggesting a higher rate of brain drain in more recent years. Breakdowns for these factors are shown in Figure 2.22.

**Figure 2.22. Highly Educated Nebraskans: Population and Migration Rates**

Highly Educated People in Nebraska	2006-2010	2011-2015	Difference
Estimated Percentage of State Population	29.8%	31.7%	+ 1.9%
Estimated Average who Completed Degree Programs	8,600	8,465	-135
Estimated Average Annual Migration	-1,362	-2,304	-942

Source: Audit Office analysis of data from 2017 Nebraska Higher Education Progress Report.

Another source of migration data, the University of Nebraska at Omaha's Center for Public Affairs Research, uses a similar definition of highly educated people and calculates that Nebraska ranks 39<sup>th</sup> in the net loss of people age 25 or older with a bachelor's or higher degree over the past 10 years.

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<sup>26</sup> Nebraska Coordinating Commission, *2017 Nebraska Higher Education Progress Report*.

The difficulties in even measuring the extent brain drain also made it difficult for us to determine what role, if any, the R&D program is playing in it. We believe this metric would benefit from creation of a logic model, which is a step-by-step method of describing what a program is expected to accomplish and how it is expected to do so. Once the model is complete, policymakers can set performance expectations for some or all of the steps.

### **The Value of Logic Models**

In order to evaluate a tax credit program effectively, we need to know exactly what it is intended to do. Best practices in evaluation use logic models as a guide to evaluation design. When designing a logic model for evaluation, either before a program is initiated or after, each step in the “chain of events” that is expected to occur is described in terms that make it obvious what data will be needed to evaluate the effectiveness of the step. The data collection can then be planned for. An evaluation of the program can then have specific activities, outcomes, targets or goals to examine, and the data necessary to do it.

There are many ways that a logic model can be designed. One variation that has been used for policy evaluation in the state of Washington is a “Logic Chain.” In fact, Washington now requires that all legislation regarding tax credits or preferences to include a “performance statement” that shows the intended chain of causation leading from the proposed policy to the ultimate intended outcome. The links of causation are then used as a starting point for future evaluations, and the basis for relevant data collection.

#### *Example of Logic Chain for Impact of Research and Development Credit on Brain Drain*

A logic chain answers two questions that are critical for evaluating a program.

1. What is the ultimate public policy purpose of the program?
2. How does this program lead to accomplishing that purpose?

If reducing brain drain was one ultimate policy goal of the R&D tax credit, that goal’s logic chain would look something like Figure 2.23 below.

**Figure 2.23. Logic Chain Example for Brain Drain**

<b>Increase the R&amp;D tax credit for activities in conjunction with higher education institutions</b>
<i>...in order to...</i>
<b>Further reduce business costs</b>
<i>...thereby...</i>
<b>Allowing companies to reinvest more resources</b>
<i>...thereby...</i>
<b>Creating more jobs that are attractive to highly educated individuals</b>
<i>...thereby...</i>
<b>Inducing highly educated individuals to choose to work in Nebraska over another state</b>
<i>...thereby...</i>
<b>Reducing brain drain in Nebraska</b>

Source: Audit Office example.



With the logic chain in place, the Legislature can establish performance targets for any or all of the steps in the chain, as shown in Figure 2.24.

**Figure 2.24. Logic Chain and Performance Target Example for Brain Drain**

<b>Logic Chain Step</b>	<b>Possible Performance Target</b>
Increase the R&D tax credit for activities in conjunction with higher education institutions	
<i>...in order to...</i>	
Further reduce business costs	<b>Reduce costs by x %</b>
<i>...thereby...</i>	
Allowing companies to reinvest more resources	
<i>...thereby...</i>	
Creating jobs that are attractive to highly educated individuals	<b>Create x number of jobs that require a degree, have a certain wage level</b>
<i>...thereby...</i>	
Inducing highly educated individuals to choose to work in Nebraska over another state	<b>Induce x number of workers to choose Nebraska</b>
<i>...thereby...</i>	
Reducing brain drain in Nebraska	<b>By x %</b>

Source: Audit Office example.

Once a logic chain and specific targets are created, the data necessary to evaluate each step becomes clearer. For example, to evaluate the number of jobs created that are attractive to highly educated individuals, evaluators would need to know how many of those jobs the companies had previously, and how many were added since they received credit under the program. Knowing that information is not generally available, evaluators can work with state agencies to find it or design a survey to produce it, or the Legislature could require participating companies to report it.

With the logic chain, targets, and data sources established, evaluations can then better judge the success or failure of the program, any of the steps of the chain, and assumptions made by policymakers. Based on the example logic chain, an ideal examination of the brain drain claim might answer the following questions:

1. How many jobs did participating companies create after they received credit? (Establishing that the Act caused the creation of those jobs will remain difficult to prove.)
2. Who filled those jobs and what was their education level?
3. How many highly educated people were attracted to those new jobs over a job from out of state?

## **Broader Application**

Just as insight into this metric could be improved through a logic chain, the logic chain concept can be applied to any outcome or goal that the Legislature intends a tax incentive program to achieve, such as jobs, wages, investment, industry participation and others. Logic models, in many forms including logic chains, have been used to bring accountability and evidence-based policy recommendations to the federal, state, and local level in a variety of policy areas including health care, education, corrections, and tax policy.

# Administrative Cost

What is the cost to administer and promote all tax incentive programs?

## Results

The total cost for administering all tax incentive programs from 2004-2015 was \$20.5 million.

The R&D Act is one of several tax incentive programs administered by the Department of Revenue and promoted by the Department of Economic Development. Neither agency tracks their expenditures specific to the Act because administration and promotion are done in conjunction with those activities for all of the other tax incentive programs. Figure 2.25 shows each department's costs for all tax incentive promotion from 2004 to 2015.

**Finding:** We are unable to report the cost to administer and promote the Research and Development Act because those figures are not specifically tracked.

**Figure 2.25. Nebraska Tax Incentive Administration Costs, 2004-2015**

Function	Department	Amount
Program Administration	Revenue	\$10,749,315
Program Promotion	Economic Development	\$9,751,000
	<b>Total</b>	<b>\$20,500,315</b>

Source: Data provided by the Departments of Revenue and Economic Development. The Audit Office did not verify the figures provided.

## Discussion

The R&D Act is less complex than two other programs administered by Revenue and promoted by DED—the Nebraska Advantage Act and the Employment and Investment Growth Act (LB 775)—so it is responsible for a proportionally smaller part of the cost.

# Fiscal Protections

What are the fiscal protections in the Act?

## Results

The R&D Act contains some fiscal protections including performance-based incentives as well as monitoring and information sharing, but does not contain more substantive protections such as regularly forecasting costs or program caps.

**Finding:** Because the Research and Development Act does not contain more stringent fiscal protections, the program is at a higher risk for exceeding expected costs. Although the Act has stayed within the state's expectations during the years being evaluated, changes in the federal Research and Experimentation Credit will likely increase costs to the state.

## Discussion

### Cost Expectations

Over the years since the R&D Act was introduced, the Legislature estimated that the Act would cost somewhere between \$2 million and \$5 million per year. At its highest point in the years examined for this evaluation, the Act cost \$4.5 million, keeping within the expected range.

### Potential Design Issue

The Nebraska Advantage R&D Act is tied to the Federal Research & Experimentation credit. The Nebraska R&D program participant receives a credit equal to a percentage of the federal credit. Due to recent changes at the federal level, Nebraska program costs may potentially rise above the expected range. The changes are recent, and the exact cost increase is not known, but U.S. Treasury estimates federal Research and Experimentation credit usage will increase more than 700% over 10 years due to passage of the Protecting Americans from Tax Hikes Act of 2015. To the extent that more companies use the federal credit and also file for the Nebraska credit, the cost to the state will obviously increase.

## Methodology

### Fiscal Protections

The Pew Charitable Trusts makes nine recommendations for ensuring tax incentive programs do not cause fiscal problems. As Figure 2.26 shows below, the Nebraska Advantage R&D Act meets four of these nine recommendations.

**Figure 2.26. 2015 Pew Report Fiscal Protection Recommendations**

Pew Report Recommendations	R&D Act	Audit Office Remarks
<b>Gathering and sharing high-quality data on the costs of incentives by:</b>		
Regularly forecasting the cost	<b>No</b>	
Monitoring costs and commitments of large and high-risk programs	<b>Yes</b>	Although the R&D Act is not a large program, annual reports are produced
Sharing timely information on incentives across relevant agencies	<b>Yes</b>	Yearly reports, Legislative evaluations.
<b>Designing incentives in ways that reduce fiscal risk, including:</b>		
Capping how much programs can cost each year	<b>No</b>	
Controlling the timing of incentive redemptions	<b>Yes</b>	Advantage R&D does not have a carryforward provision. Credits must be used for the tax year in which they are earned.
Requiring lawmakers to pay for incentives through budget appropriations	<b>No</b>	
Restricting the ability of companies to redeem more in credits than they owe in taxes	<b>No</b>	Advantage R&D credits are fully refundable.
Linking incentives to company performance	<b>Yes</b>	Companies must increase R&D spending as defined by federal statute.
Requiring businesses to provide advance notice of program participation	<b>No</b>	Companies simply fill out a form to claim state credit after federal credit is awarded.

Source: Audit Office analysis using recommendations from The Pew Charitable Trusts, *Reducing Budget Risks: Using Data and Design to Make State Tax Incentives More Predictable*, 2015.



## **APPENDIX A: Location Quotient of Employment**

### **High-tech (HT) Sector: Nebraska (NE) and U.S.**

	<b>2005</b>	<b>2015</b>
NE Total Private HT Sector Employment	32,415	35,385
NE Total Private Employment	739,567	799,388
NE HT % of Total Private Employment	4.38%	4.43%
U.S. Total Private HT Sector Employment	6,245,853	7,487,832
U.S. Total Private Employment	110,611,016	118,307,717
U.S. HT % of Total Private Employment	5.65%	6.33%
<b>Location Quotient of Employment</b>	<b>0.78</b>	<b>0.70</b>
NE Total Employment	73,9567	799,388
U.S. HT % of Total Employment	5.65%	6.33%
U.S. HT % of NE Total Employment	41,761	50,594
NE Actual Total Private HT Employment	32,415	35,385
<b>Difference between NE Actual HT &amp; U.S. % of NE HT</b>	<b>9,346</b>	<b>15,209</b>

### **Renewable Energy (RE) Sector: Nebraska (NE) and U.S.**

	<b>2005</b>	<b>2015</b>
NE Total Private RE Sector Employment	14,353	19,488
NE Total Private Employment	739,567	799,388
NE RE % of Total Private Employment	1.94%	2.44%
U.S. Total Private RE Sector Employment	3,415,286	3,798,808
U.S. Total Private Employment	110,611,016	118,307,717
U.S. RE % of Total Private Employment	3.09%	3.21%
<b>Location Quotient of Employment</b>	<b>0.63</b>	<b>0.76</b>
NE Total Employment	739,567	799,388
U.S. RE % of Total Employment	3.09%	3.21%
U.S. RE % of NE Total Employment	22,835	25,668
NE Actual Total Private RE Employment	14,353	19,488
<b>Difference between NE Actual RE &amp; NE % of U.S. RE</b>	<b>8,482</b>	<b>6,180</b>





# APPENDIX B: High-tech Shift-share Analysis

NAICS Code	Industry Sector	Total Employment by Sector, United States						Total Employment by Sector, Nebraska						National Share	Industry Mix	Regional Shift	Total Change in Employment 2005-2015
		2005	% of total	2015	% of total	# Change	% change	2005	% of total	2015	% of total	# Change	% change				
2111	Oil and gas extraction	125818	0.11%	192337	0.16%	66719	53%	100	0.01%	47	0.01%	-53	-53%	7	46	-106	-53
3254	Pharmaceutical and medicine manufacturing	288155	0.26%	280131	0.24%	-8024	-3%	1976	0.27%	1687	0.21%	-289	-15%	137	137	-234	-289
3341	Computer and peripheral equipment mfg.	203578	0.18%	161347	0.14%	-42231	-21%	529	0.07%	0	0.00%	-529	-100%	37	-147	-419	-529
3342	Communications equipment manufacturing	147132	0.13%	88296	0.07%	-58836	-40%	1963	0.27%	229	0.03%	-1734	-88%	137	-922	-949	-1734
3344	Semiconductor and electronic component manufacturing	446503	0.40%	367283	0.31%	-79220	-18%	1718	0.23%	2137	0.27%	419	24%	120	-424	724	419
3345	Electronic instrument manufacturing	433812	0.39%	398548	0.34%	-35264	-8%	1376	0.19%	1636	0.20%	260	19%	96	-208	372	260
3364	Aerospace product and parts manufacturing	453136	0.41%	489521	0.41%	36385	8%	333	0.05%	477	0.06%	144	43%	23	4	117	144
5112	Software publishers	236916	0.21%	332271	0.28%	95355	40%	383	0.05%	817	0.10%	434	113%	27	128	280	434
5171	Wired telecommunications carriers	506655	0.46%	587216	0.50%	80551	16%	2452	0.33%	2352	0.29%	-100	-4%	171	219	-490	-100
5179	Other telecommunications	6845	0.01%	80161	0.07%	73316	1071%	0	0.00%	472	0.06%	472	#DIV/0!	0	0	#DIV/0!	#DIV/0!
5182	Data processing, hosting and related services	265248	0.24%	296697	0.25%	31449	12%	6279	0.85%	4832	0.60%	-1447	-23%	437	308	-2191	-1447
5191	Other information services	49976	0.05%	242727	0.21%	192751	386%	49	0.01%	1056	0.13%	1007	2055%	3	186	818	1007
5413	Architectural and engineering services	1313130	1.19%	1402609	1.19%	89479	7%	5770	0.78%	6221	0.78%	451	8%	401	-8	58	451
5415	Computer systems design and related services	1196884	1.08%	1908010	1.61%	711126	59%	7868	1.06%	11882	1.49%	4014	51%	547	4127	-661	4014
5417	Scientific research and development services	572055	0.52%	660478	0.56%	88423	15%	1619	0.22%	1540	0.19%	-79	-5%	113	138	-329	-79
10	Total, all industries	110611016	100.00%	118307717	100.00%	7696701	7%	739567	100.00%	799388	100.00%	59821	8%	51462	0	8359	59821
	Combined "HT Sector"	6245853	5.65%	7487832	6.33%	1241979	20%	32415	4.38%	35385	4.43%	2970	9%	2256	4190	-3476	2970
	Combined "HT Sector", Excl. 3341 and 5179	6035430	5.46%	7246324	6.12%	1210894	20%	31886	4.31%	34913	4.37%	3027	9%	2219	4179	-3370	3027
	All numbers reflect private employment only. Federal, State, and local government employment is not included.																
	Highlighted industry sectors had a year with insufficient activity to allow reporting of Nebraska employment.																
	All data comes from the Bureau of Labor Statistics Quarterly Census of Employment and Wages																



# APPENDIX C: Renewable Energy Shift-share Analysis

NAICS Code	Industry Sector	Total Employment by Sector, United States					Total Employment by Sector, Nebraska					National Share	Industry Mix	Regional Shift	Total Change
		2005 % of total	2015 % of total	# Change	% change	2005 % of total	2015 % of total	# Change	% change						
1111*	Oilseed and Grain Farming	30506	54433	23927	78%	1364	3221	1857	136%	95	975	787	1857		
1112*	Vegetable and Melon Farming	98475	98882	407	0%	311	321	10	3%	22	-20	9	10		
1113*	Fruit and Tree Nut Farming	164334	196702	32368	20%	87	86	-1	-1%	6	11	-18	-1		
111411	Mushroom Production	14672	12722	-1950	-13%	0	0	0	0.00%	0	0	0	0		
111419	Other Food Crops Grown Under Glass	6717	10160	3443	51%	148	95	-53	-36%	10	66	-129	-53		
111930	Sugarcane Farming	6088	4057	-2031	-33%	0	0	0	0.00%	0	0	0	0		
111991	Sugar Beet Farming	1401	1872	471	34%	48	39	-9	-19%	3	13	-25	-9		
113310	Logging	64870	51765	-13105	-20%	19	8	-11	-58%	1	-5	-7	-11		
2211*	Electric Power Generation, Transmission and Distribution	52520	15583	-36937	-70%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
221330	Steam and Air-Conditioning and Refrigeration Equipment Manufacturing	1913	1638	-275	-14%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
237130	Power and Communication Equipment and Apparatus Manufacturing	125346	169783	44437	35%	991	1052	61	6%	69	282	-290	61		
237210	Land Subdivision	92229	41534	-50695	-55%	284	203	-81	-29%	20	-176	75	-81		
237990	Other Heavy and Civil Engineering Construction	105095	109139	4044	4%	720	906	186	26%	50	-22	158	186		
325193	Ethyl Alcohol Manufacturing	5024	11087	6063	121%	750	1960	1210	161%	52	853	305	1210		
325199	All Other Basic Organic Chemical Manufacturing	32169	37481	5312	17%	205	426	221	108%	14	20	187	221		
331512	Steel Investment Foundries	12690	11862	-828	-7%	0	0	0	0.00%	0	0	0	0		
331513	Steel Foundries (except investment)	20242	17508	-2734	-14%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
33152*	Nonferrous Metal Foundries	72127	55825	-16302	-23%	173	144	-29	-17%	12	-51	10	-29		
332111	Iron and Steel Forging	26186	24148	-2038	-8%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
332112	Nonferrous Forging	7482	7045	-437	-6%	0	0	0	0.00%	0	0	0	0		
333414	Heating Equipment (except warm air conditioning and heat pumps)	20737	15681	-5056	-24%	164	0	-164	-100%	11	-51	-124	-164		
333415	Air-Conditioning and Warm Air Heating Equipment and Electric and Mechanical Work	103769	83097	-20672	-20%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
333511	Industrial Mold Manufacturing	42060	39503	-2557	-6%	84	79	-5	-6%	6	-11	0	-5		
3336*	Engine, Turbine, and Power Turbine Manufacturing	49388	54358	4970	10%	190	196	6	3%	13	6	-13	6		
334519	Other Measuring and Controlling Instrument Manufacturing	29865	37103	7238	24%	0	0	0	0.00%	0	0	0	0		
485510	Charter Bus Industry	31958	29190	-2768	-9%	202	309	107	53%	14	-32	124	107		
541330	Engineering Services	829640	938389	108749	13%	3707	4025	318	9%	258	228	-168	318		
541360	Geophysical Surveying and Mapping	15505	17853	2348	15%	16	26	10	63%	1	1	8	10		
541370	Surveying and Mapping (except geophysical)	63489	45912	-17577	-28%	114	102	-12	-11%	8	-39	20	-12		
541620	Environmental Consulting Services	68611	83957	15346	22%	137	246	109	80%	10	21	78	109		
541690	Other Scientific and Technical Consulting Services	87720	201431	113711	130%	396	873	477	120%	28	486	-36	477		
54171*	Scientific Research and Development	508529	600060	91531	18%	1528	1439	-89	-6%	106	169	-364	-89		
561730	Landscaping Services	619486	713552	94066	15%	2715	3732	1017	37%	189	223	605	1017		
562213	Solid Waste Combustors and Incinerators	4443	5496	1053	24%	0	0	0	0.00%	0	0	0	0		
10	Total, all industries	110611016	118307717	7696701	7%	739567	7993388	59821	8%	51462	0	8359	59821		
	Combined "RE Sector"	3415286	3798808	383522	11%	14353	19488	5135	36%	999	613	3523	5135		
	Combined "RE Sector", excl. h	3173309	3612686	439377	14%	14353	19488	5135	36%	999	989	3148	5135		

\* Indicates an industry sector that was combined for ease of analysis. Only BLS-identified "Renewable" Sub-sectors are included in combined sectors.

All numbers reflect private employment only. Federal, State, and local government employment is not included. Highlighted industries have NE establishments, but did not meet BLS confidentiality requirements to report in at least one of the two comparison years. Those are excluded in the second "Combined" Sector results. All data comes from the Bureau of Labor Statistics Quarterly Census of Employment and Wages.



### ***III. Agency Response and Fiscal Analyst's Opinion***



# NEBRASKA

Good Life. Great Service.

DEPARTMENT OF REVENUE

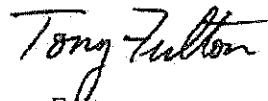
October 25, 2017

Martha Carter  
State Capitol  
PO Box 94604  
Lincoln, NE 68509

Ms. Carter,

I am in receipt of the Performance Audit Section Draft Report of "Nebraska Advantage Research and Development Act Performance on Selected Metrics" which was provided to the Department of Revenue (Department) on September 26, 2017. The Department does not have any comments to the findings stated in the draft report. Thank you for the time and effort expended by the Legislative Audit Office in conducting this audit. We enjoyed working with you and the members of the audit team.

Respectfully Submitted,



Tony Fulton  
Tax Commissioner





## **Legislative Auditor's Summary of Agency Response**

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This summary meets the requirement of Neb. Rev. Stat. § 50-1210 that the Legislative Auditor briefly summarize the agency's response to the draft audit report and describe any significant disagreements the agency has with the report or recommendations.

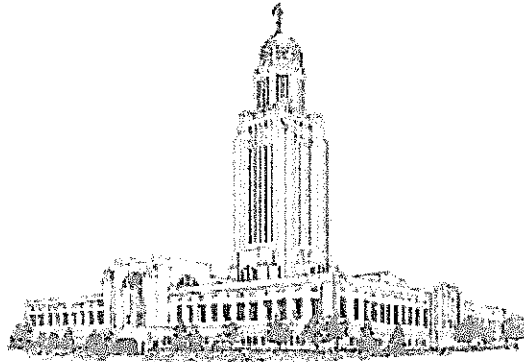
The Tax Commissioner stated that the Department had no comments related to the draft report findings so there is nothing to address in this summary.



# State of Nebraska

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Legislative Fiscal Office  
PO Box 94604, State Capitol  
Lincoln, NE 68509-4604

October 19, 2017

PATRICK J. O'DONNELL  
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NANCY CYR  
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MARTHA CARTER  
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JOANNE PEPPERL  
Revisor of Statutes

MICHAEL CALVERT  
Legislative Fiscal Analyst

MARSHALL LUX  
Ombudsman

Martha Carter  
Legislative Auditor  
Performance Audit  
11<sup>th</sup> Floor, State Capitol  
Lincoln, NE 68509

Dear Martha;

You have asked for Fiscal Office comments regarding costs associated with your draft reports submitted for our review. The reports are identified below along with our comments.

**Fiscal Office comments on [Draft Report, Nebraska Advantage Rural Development Act Performance on Selected Metrics](#)**

On page 5, the draft recommendation for "Other State Benefits Metric" we need to first clarify our understanding of current law, whereas under current law it is possible for a taxpayer to apply for and qualify for more than one state incentive, as long as the incentives are for separate projects. From that perspective if the recommendation is to become more restrictive, limiting the taxpayer to only one incentive, some potential exists for reduced future revenue and/or expenditures depending on the financial structure of an incentive. If the recommendation is intended to become less of a restriction, where the taxpayer can qualify for multiple incentives for a project, the potential exists for greater cost consequences to the state. The recommendation also mentions capping state funding "any individual company may receive." The financial consequence, if any, will depend on the specifics of any cap, ie, does it apply to benefits paid in any one year or duration of the qualification period; does it apply at a company or project level? In the first instance a cap applied in a year may not reduce the total liability of the state for future years' incentive payments, in other words, cost consequences are deferred to future years, not held to an absolute limit less than a qualified amount. In the second instance, a cap at

a company level may be difficult to track, given the possibility of multiple incentive programs under agreement with a company, whereas a cap at a project level could become manipulated by a company by managing the number of projects it may seek for incentive support. Given these unknowns, any general assessment of cost consequences is not possible.

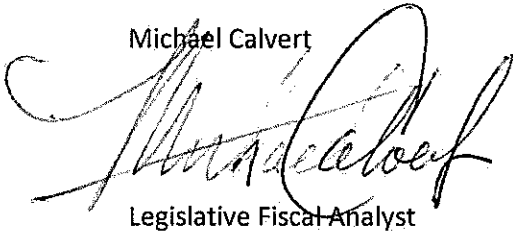
On page 7, the draft recommendation for "Data Concerns" we believe that costs to develop a data base could be in the range of \$15,000 to \$20,000.

**Fiscal Office comments on Draft Report, Nebraska Advantage Research and Development Act Performance on Selected Metrics.**

On page 7, the second draft recommendation for "Brain Drain Metric" would probably require legislation to implement an evaluation program similar to the state of Washington. If passed, there would likely be some cost to implement, for personnel and operating costs, estimated at approximately \$50,000 per year.

If you have any questions, please contact me.

Michael Calvert

A handwritten signature in black ink, appearing to read 'Michael Calvert', written over a printed name and title.

Legislative Fiscal Analyst