

## Indiana's Coal Mining Industry

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The debate over energy has intensified in Indiana with the upcoming finalization of the U.S. Environmental Protection Agency's (EPA) Clean Power Plan. By the year 2030, the plan proposes to cut power-sector carbon emissions by 30 percent from 2005 levels.

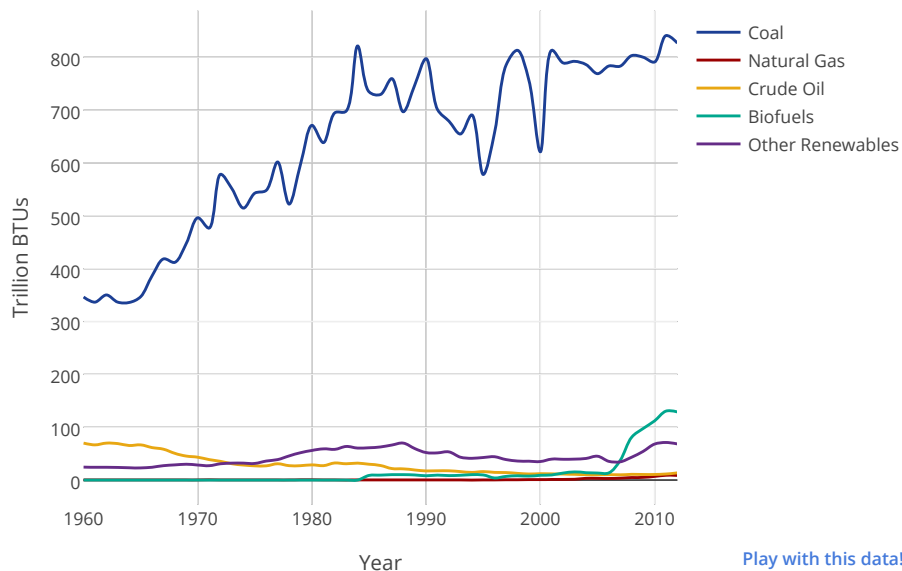
Achieving these significant decreases in emissions will require changes to both the generation and consumption of power in Indiana. This article seeks to inform the debate on the future of energy in Indiana by taking a closer look at the current role of coal in Indiana's energy sector and its impact on local and state economies.

### The Energy Sector in Indiana

What powers Indiana? Coal is the overwhelming answer (see **Figure 1**). In fact, Indiana is the nation's second-largest overall consumer of coal—behind only Texas—and it's the largest consumer of coal by the industrial sector.

Much of the coal is used for electricity generation, with **coal-fired power plants producing 87 percent of Indiana's electricity in 2014 compared to the national average of 40 percent, according to the U.S. Energy Information Administration.**

**Figure 1: Indiana Energy Production Estimates**



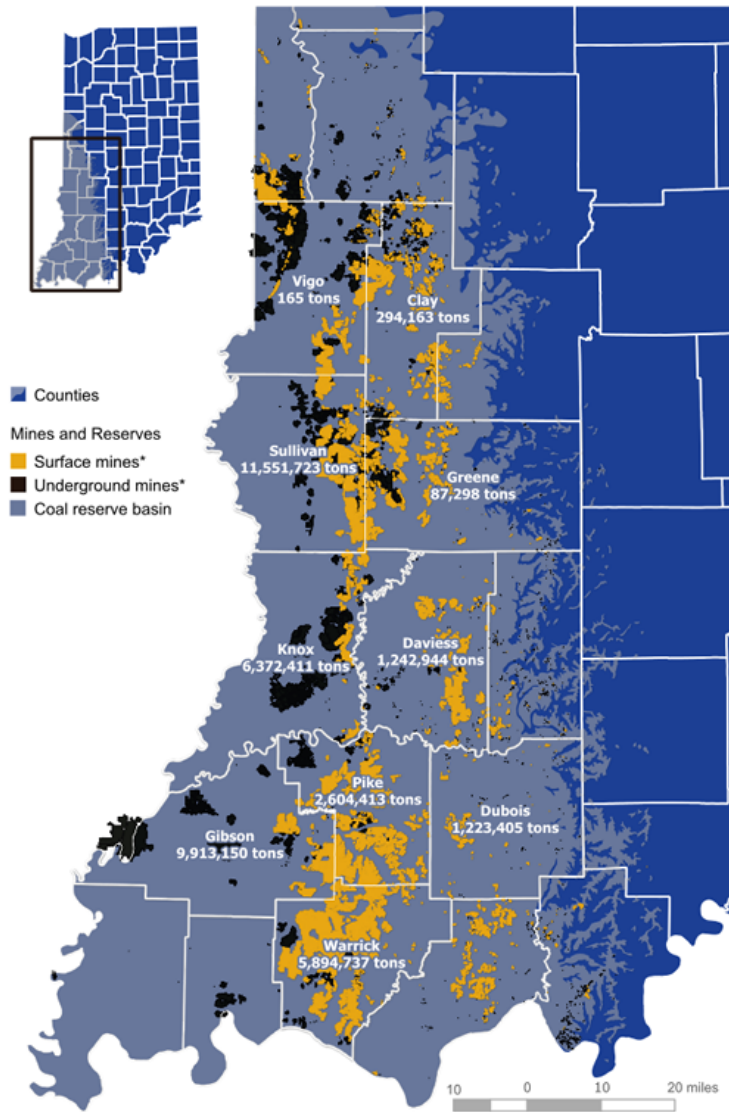
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Source: U.S. Energy Information Administration

### Indiana Coal Production

Indiana is the nation's eighth-largest producer of coal, yet production is not enough to meet demand. Indiana imports approximately 40 percent of the coal it consumes.<sup>1</sup> **Figure 2** provides a compelling view of coal production across the state, as well as the spread of coal reserves and mining locations across southwestern Indiana.

**Figure 2: Coal Production by County, 2014**



\*Includes active and closed mines

Sources: Indiana Geological Survey, Indiana Coal Council, U.S. Bureau of Economic Analysis, United States Geological Survey

While total state production has risen steadily over the past 10 years, coal production has varied greatly by county over time as mines are depleted and new mines begin production (see **Table 1**).

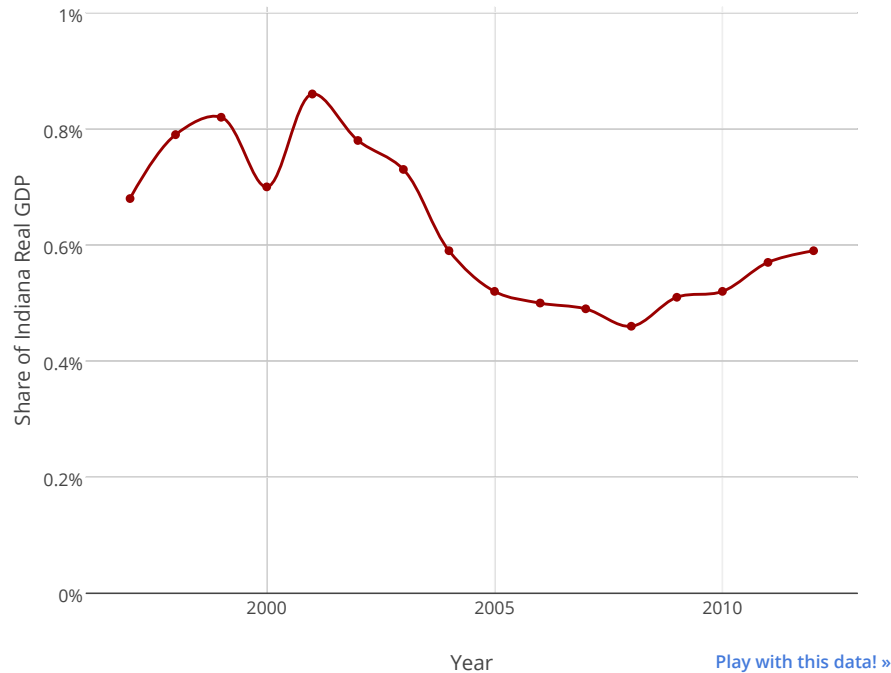
**Table 1: Coal Production by County (thousands of tons)**

County	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sullivan	84	172	972	2,054	2,780	5,962	9,936	10,880	12,152	11,552
Gibson	15,176	15,690	14,898	15,403	12,919	11,562	10,583	9,546	10,672	9,913
Knox	4,076	5,100	4,869	5,264	5,045	4,761	5,044	4,543	5,461	6,372
Warrick	1,288	1,187	1,403	1,352	2,399	2,279	3,332	4,330	4,930	5,895
Pike	4,854	4,507	3,934	3,660	3,929	4,281	3,949	3,406	3,066	2,604
Daviess	3,537	3,334	3,451	3,544	3,492	2,812	2,688	2,326	2,058	1,243
Dubois	0	75	641	838	1,124	1,204	1,128	867	1,160	1,223
Clay	1,378	815	549	602	710	597	539	18	78	294
Greene	3	0	0	0	0	0	31	13	21	87
Vigo	3,846	3,835	3,514	3,330	3,558	1,562	36	90	22	<1
Spencer	217	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>34,460</b>	<b>34,716</b>	<b>34,231</b>	<b>36,047</b>	<b>35,996</b>	<b>35,020</b>	<b>37,266</b>	<b>36,019</b>	<b>39,620</b>	<b>39,184</b>

### Mining's Share of Indiana's Economy

The mining industry, excluding oil and gas, has long comprised less than 1 percent of Indiana's total real gross domestic product (GDP). The data are available only at this aggregated industry level, which includes coal mining, metal ore mining, and nonmetallic mineral mining and quarrying industries. Even considering the rising share of real GDP from 2009 to 2012, **Figure 3** shows that the coal mining industry made up less than 0.6 percent of Indiana's real GDP in 2012.

**Figure 3: Mining (Except Oil and Gas) Industry's Share of Indiana Real GDP**

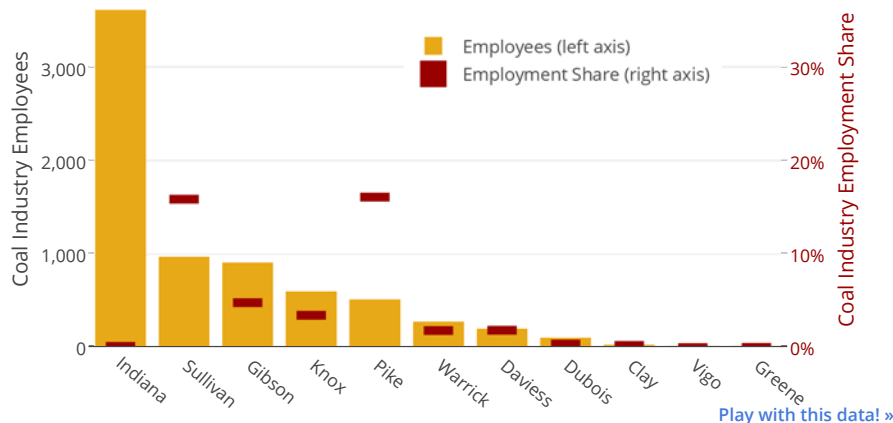


Source: U.S. Bureau of Economic Analysis

Coal mining may not generate a large share of the state's real GDP, but the industry has a considerable effect on local economies. **Figure 4** displays the total number of coal mining industry employees for the state and for coal producing counties in yellow, and the coal mining industry employment share in red.

The coal mining industry plays a particularly important role in the economies of Pike and Sullivan counties where more than 15 percent of the workforce was employed in coal mining in 2013, compared to the state average of 0.13 percent.

**Figure 4: Coal Mining Employment and Employment Share, 2013**



Sources: U.S. Energy Information Administration and the U.S. Bureau of Labor Statistics (Quarterly Census of Employment and Wages)

## **Conclusion**

Coal is important in Indiana: the state relies on coal for electricity generation and use in the industrial sector. Statewide, Indiana receives relatively small direct economic impacts from the coal mining industry, but there is considerable impact in the areas where it is mined. Indiana may be a top 10 coal-producing state, but due to the concentration of reserves in the southwest part of the state, coal mining remains a highly localized industry.

## **Note**

1. Source: U.S. Energy Information Administration, "State Profile and Energy Estimates: Indiana," March 2015, [www.eia.gov/state/analysis.cfm?sid=IN](http://www.eia.gov/state/analysis.cfm?sid=IN).

## Ninety Years of Agriculture: Going Beyond the Rockefeller Image of Farming

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To commemorate the **Indiana Business Research Center's** 90th anniversary, *InContext* has featured several articles that look back to see how the state of Indiana has changed over the last nine decades. In this issue, we will compare and contrast Indiana's agriculture industry in 1925 versus the industry today.

### The 1920s and Tractors

In the urban areas of Indiana, lots of changes were occurring during the 1920s, with rapid advances and growth in banking, industrial manufacturing, construction and electricity.<sup>1</sup> The rural areas of the state were also experiencing change and new inventions, but to a different degree.

Indiana in 1925 was heavily dependent on production agriculture, with 86.3 percent of the state's acres in farmland and 25.9 percent of the state's population residing on the 195,786 farms throughout the state. Farming was hard work with a great deal of manual labor that included the entire family.

Industrialization of the production agriculture process and its output was just beginning. In the early to mid-1920s, farmers were still riding the prosperity wave that resulted from the wartime food demand during World War I.

Tractor ownership was still in its infancy, with only 12 percent of Indiana farmers reporting tractor usage in 1925. Tractors and related machinery ownership picked up steam after 1924 with the invention of a general-purpose tractor (McCormick Deering Farmall). Farmers were able to reduce their reliance on horses and greatly improve production efficiencies. Consequently, fewer acres went into horse food production and instead into cash crops (crops sold at market). Drawbacks to utilizing tractors and corresponding machinery did exist, but farming was done at greater speed on a scale deemed impossible in prior years.

The latter half of the 1920s saw agricultural market prices drop, forcing farmers to scrutinize their finances and farming plans. For a farmer to justify the purchase of machinery, and in order to pay the high up-front cost, they needed to produce much more—often necessitating the purchase of additional ground. Therefore, larger farms (about 50 acres) were more likely to invest in machinery compared to smaller farms. Many small farms that purchased tractors but did not increase their production lost their farms in the ensuing Great Depression.<sup>2</sup>

In many ways, this similar dilemma exists today. Larger operations are often in a position to purchase newer technologies, as well as land, in an effort to maximize efficiencies.

### Agriculture Today

Today, the agriculture industry is much more diverse and technologically advanced than it was 90 years ago. Diversity is readily apparent when comparing the two Census of Agriculture results. The 2012 version encompasses a much larger scope of operations in regards to crops grown and livestock raised in addition to production practices.

At the local level, we have seen a shift from where most farmers (and their families) live and work on the farm full-time to an



Photo courtesy of Sherry Thurner from her blog [Late B\(I\)oomer - Sherry Thurner](#)

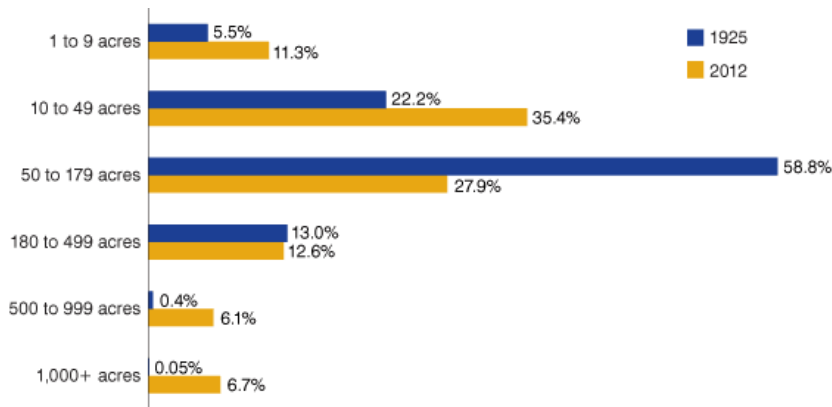
increased number of off-farm jobs held by the principal operators, as well as their spouses. The amount of necessary capital to start and maintain a farming operation is staggering in light of producing a homogenous commodity. While a farmer does receive a degree of protection when disaster strikes, it is still a risky business with many factors out of the farmer's control.

One thing that has not changed is the amount of sweat equity farmers invest in their farm. Over the past 90 years, it has remained hard work—physically and mentally. That hard work is aided now that the farming operation itself can be technologically advanced. Today, farm implements are able to respond to an individual farmland section's needs as a result of soil grid mapping, soil type, past production output and applications of fertilizer, lime or other nutrients. Seed genetics have advanced to better withstand drought conditions, pests and diseases all while improving yields.

Technological advances have also been applied to livestock operations. Advances range from genetics, complex feed rations with numerous types of nutrients infused to maximize growing efficiencies, breeding practices, as well as scientific research on best growing practices.

**Families still operate 87 percent of all farms—yet the average farm size has grown 147 percent (151 acres) since 1925.** The most startling difference between then and now? The number of farms in Indiana has dropped 70 percent since 1925, but farmland acreage has only seen a 26 percent drop. It is easy to see there has been a considerable amount of farm consolidation over the years. Interestingly, in the past 20 years, a resurgence of smaller farming operations has occurred, with many growing products to fit a market niche among consumers. **Figure 1** shows the change in farm size distribution between the two points of interest (2012 Census of Agriculture data was the most recent available).

**Figure 1: Indiana Farms by Size**



Source: USDA Census of Agriculture, 1925 and 2012

As the quantity of farms has decreased, so has the number of individuals who have direct experience with production agriculture. In recent years, the agriculture industry has focused on educating consumers on how large-scale agriculture production works. In the past, a greater share of the population farmed and had a more intimate understanding about their food supply and the process it took to arrive at their tables.

Today, most farms produce a few commodities and either take all, or a large share, of their output to the market. This is an important shift away from subsistence farming as it shows how much manufacturing and wholesale operations play a part in adding value to the raw outputs from the farm.<sup>3</sup>

Consumers generally have limited knowledge about their food's origin and the journey it took to the grocery store. Currently, we are experiencing a resurgence of interest in local foods, with consumers yearning to understand food, production practices and have a relationship with the farmer. The local foods movement has extended beyond farmers markets, as restaurants source foods locally, institutions prefer purchasing local foods, and consumers become more engaged via farm tours, community-supported agriculture memberships and support of local foods initiatives.

### Ag Change by the Numbers

The previous two sections attempted to explain the agricultural environment at the respective time frames. This final section will quantify the changes over the past nine decades for a select number of categories.

**Table 1** shows the values for 1925 and 2014 (in some cases, 2012 data was the most recent available), as well as the change over

time. The quantity of farmland, farms and acres have been declining. On the flip side, the total value of products sold has increased dramatically (so have expenses). It must be iterated that in 1925, a sizeable amount of the production at the farm level was also used to feed the family and farm animals. Today, the market opportunities (and demand) for agricultural goods span across the globe.

Farmland distribution shows Indiana's farmland has remained in cropland, at an increase of 42 percent over the past 90 years, at the expense of pastureland and other farmland ground. The share of Indiana's farmland in woodland has also increased. Historically, farmers have owned a hefty share of the state's woodland acres, and our state woodland has been very successful at regenerating itself over the years.

**Table 1: Indiana Agriculture Statistics**

Metric	1925	2014	Difference
<b>Acres in farmland</b>	19,915,120	14,700,000	-26.2%
<b>Number of farms</b>	195,786	58,200	-70.3%
<b>Number of farmers**</b>	628,855	87,959*	-86.0%
<b>Average farm size (acres)</b>	102	253	148.8%
<b>Total value of products sold</b>	\$224,535,957	\$11,210,818,000*	4,892.9%
<b>Average net cash farm income</b>	n/a	\$52,861*	n/a
<b>Average total farm production expenses</b>	\$23,141,229	\$155,330,000*	571.2%
<b>Farmland Distribution</b>			
<b>Share of farmland in cropland</b>	60.2	85.5*	42.0%
<b>Share of farmland in pasture</b>	28.7	3.7*	-87.1%
<b>Share of farmland in woodland</b>	4.2	7.1*	69.0%
<b>Share of farmland in other use</b>	6.9	3.6*	-47.8%
<b>Productivity (bushels/acre)</b>			
<b>Corn for grain</b>	22.9	188	721.1%
<b>Wheat</b>	16.5	76	361.9%
<b>Oats</b>	36.3	74	103.7%
<b>Soybeans</b>	n/a	56	n/a
<b>Inventory of Livestock Production</b>			
<b>Chickens***</b>	17,355,369	39,392,705*	127.0%
<b>Hogs and pigs</b>	2,939,074	3,600,000	22.5%
<b>Cattle</b>	1,281,810	870,000	-32.1%
<b>Horses</b>	556,078	97,383*	-82.5%
<b>Sheep</b>	595,461	50,000*	-91.6%
<b>Goats</b>	3,995	42,500	963.8%
<b>Milk produced per cow (gallons)</b>	412	2,542	517.1%

\* 2012 data are shown because they are the most recent available.

\*\* 1925 data reflects population older than 10 years on the farm; 2012 data reports for up to three operators per farm.

\*\*\* 2012 data reflects layers, pullets and broilers; no detail provided for 1925 data.

Note: 1925 agricultural values were adjusted for inflation to reflect 2012 values.

Source: Purdue Extension, using USDA Census of Agriculture and National Agricultural Statistics Service data

Row crop production efficiencies have improved tremendously with the large increases in bushels per acre. As the quantity of farmland acres have declined, research and innovation has improved crop genetics, precision machinery and technological advances. As for Indiana's livestock inventory, some industries have seen growth, such as chickens, hogs and pigs, goats and milk production. It was expected to see a decline in horses since 1925 due to lack of usage in the majority of farm operations. Cattle have declined in the state, especially in the past 15 years due to a combination of factors. In 1925, many families still made their own clothing—hence the need for wool. Today, that need for homemade clothing is not as great, thus likely attributing to the decline in sheep.

## Summary

The changes to Indiana's agriculture industry are more expansive than what we had space for in this article. The industry has seen a significant amount of change in regard to industrialization, production efficiencies, number of farms, farmland acreage, farming operators, resurgence of local foods and much more. In the midst of the evolution, the agriculture industry is still comprised of close-knit families who genuinely care and celebrate its heritage—all the while tackling challenges lying before them.

## Want More?

If you would like to learn more information about the nation's agriculture industry, be sure to visit [www.agcensus.usda.gov](http://www.agcensus.usda.gov) and explore the numerous tables and maps at various geographic levels.

For those with infinite appetites for historical data, be sure to visit the [1925 Census of Agriculture](#) and the [2012 Census of Agriculture](#) for Indiana.

## Notes

1. To learn more about the economy in the 1920s versus today, see Jerry Conover, "The Rearview Mirror: A 90-Year Retrospective on Indiana's Economy," *InContext*, May-June 2015, [www.incontext.indiana.edu/2015/may-jun/article2.asp](http://www.incontext.indiana.edu/2015/may-jun/article2.asp).
2. An agricultural history resource on 1924 is available via the Indiana Historical Society: Janet Brown, "Curriculum Guide: Mechanization in Agriculture: The Farmer's Dilemma," *Indiana Historical Society*, 2010, [www.indianahistory.org/teachers-students/plan-a-field-trip/Web%20Tin%20Lizzies%20Agriculture%20Lesson.pdf](http://www.indianahistory.org/teachers-students/plan-a-field-trip/Web%20Tin%20Lizzies%20Agriculture%20Lesson.pdf).
3. Likewise, one could see how it can be difficult to discern where the agriculture industry "ends" within the valued-added process. Some researchers argue that it needs to include manufacturing and wholesale outlets, whereas others only include industries with a sizeable share of raw agricultural input.



## The Asymmetric Impact of Policy and the Need to Regionalize

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A real estate agent will tell someone the key to success in real estate is “location, location, location.” Unfortunately, this philosophy is often lost on policymakers and economists. They are often willing to nationalize policy because of ease and ignore regional effects, rather than deal with the potential implications of regional differences to make policy better. An instance of this phenomenon is evidenced in the current debate over the minimum wage.

Regional differences can have profound impacts that distort the intent of the desired policy. To illustrate, examine the hypothetical market for cashiers. A retail cashier is a relatively low-wage and low-skill position. It is an entry point in the job market from which further advancement is hoped. As an entry position in the job market, the wages of this position tend to gravitate toward minimum wage. The U.S. Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES) survey reports the 2012 wage for cashiers in New Jersey was \$10.14 per hour. In Indiana, it was \$9.07 per hour.

Cashiers in Indiana made \$1.07 per hour (or 11.7 percent) less than their New Jersey counterparts. If policymakers had proposed and increased the national minimum wage to \$10.10 per hour, it would not have impacted New Jersey cashiers, but would have increased Indiana cashier wages by 11.4 percent (see **Table 1**).

**Table 1: Comparison of Cashier Wages in Indiana and New Jersey**

	<b>Indiana</b>	<b>New Jersey</b>
Cashier Mean Hourly Wage*	\$9.07	\$10.14
Proposed Minimum Hourly Wage	\$10.10	\$10.10
Percent Change	11.4%	-0.4%
Regional Price Parity**	91.91	112.9
Adjusted Cashier Mean Hourly Wage	\$9.80	\$8.83
Real Wage Needed for Purchasing Power of \$10.10	\$9.34	\$11.60
Difference from Current Wage	\$0.27	\$1.46

\* 2012 OES wage for SOC #412011 from the U.S. Bureau of Labor Statistics

\*\* 2011 regional price parity from the U.S. Bureau of Economic Analysis

Source: Author's calculations

A dollar earned in New Jersey is not the same as a dollar earned in Indiana due to differences in cost of living. To make adjustments for the differences in costs of living, the U.S. Bureau of Economic Analysis provides an adjustment factor called the Regional Pricing Parity (RPP). Using the RPP, it is possible to extract the real purchasing power of wages in a given market, as money is only as useful as the goods and services it can provide to maintain a standard of living.

The cashier wages are modified using the RPP to reflect their purchasing power. The purchasing power of Indiana cashiers was \$9.80 per hour, while the purchasing power of New Jersey cashiers was only \$8.83 per hour. While the nominal wages of New Jersey cashiers were higher, due to their higher cost of living, the standard of living achieved with those dollars was actually less than in Indiana. Thus, even though New Jersey nominal wages were higher, Indiana cashiers maintained a slightly higher standard of living in real terms.

If the aim of the proposed policy was to provide cashiers with an improved standard of living (purchasing power) nationally, then the proposed increase to \$10.10 per hour would be more effective if converted into real purchasing power terms. The real wage

equivalent would have been \$9.34 per hour for Indiana and \$11.60 per hour for New Jersey. Under this scenario, the cashiers in both states would have seen nominal increases in wages. More importantly, both would have also achieved higher real wages and equality of purchasing power in their respective markets.

Applying a uniform rate nationally will have different impacts in various markets due to different costs of living. It is possible that the most deserving will receive the least benefit. In the previous example, uniformly applying a \$10.10 per hour wage nationally would not help New Jersey, despite being the one in more need of assistance. Without accounting for regional differences, the impact of policy may differ from its original intent.