

Vermont Heating Fuel Delivery and Service Providers 2016 Industry Survey



Prepared for: The Vermont Fuel Dealers Association

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About the Center for Rural Studies

The Center for Rural Studies (CRS) is a nonprofit, fee-for-service research organization that addresses social, economic, and resource-based problems of rural people and communities. Based in the College of Agriculture and Life Sciences at the University of Vermont (UVM), CRS provides consulting and research services in Vermont, the United States, and abroad. The research areas are divided into five main areas: Agriculture, Human Services and Education, Program Evaluation, Rural Community and Economic Development, and Vermont Community Data. The mission of CRS is to promote the dissemination of information through teaching, consulting, research and community outreach. Primary emphasis is placed upon activities that contribute to the search for solutions and alternatives to rural problems and related issues. Bringing decades of experience to its work, CRS recognizes that answers to critical and timely questions often lie within a community or organization.

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Summary of Findings

In July 2016, the Vermont Fuel Dealers Association (VFDA) contracted with the Center for Rural Studies (CRS) at the University of Vermont to conduct an industry assessment and an economic contribution study of Vermont heating fuel and service companies. This study comes during a time of transition in the home energy sector. Over the past three years, oilheat prices are the lowest they have been in decades. While both price of heating oil and heating degree days fluctuate from year to year the overall heating oil consumption trend is downward. Conversions to other heating fuels, more efficiency heating equipment and advanced weatherization methods have contributed to the decrease in demand of heating oil in Vermont.

Key findings of the study include:

Diversification of services

The Vermont heating fuel delivery and services sector used to be siloed with high business specialization. As a way to reach new customers and to adapt to the changing environment, the survey respondents reported that they are increasing their offerings by for instance selling both fuel and providing services but also by offering new products and services such as biodiesel blending heating oil and heat pumps. Diversification into other products and services was actually seen as an opportunity for the industry in the next five years by 48.1% of the survey respondents.

Access to qualified labor

The industry offers good paying jobs with benefits but is facing major challenges in finding qualified labor. The average hourly rate reported by survey respondents is above the average per capita income in Vermont and over 90% of the respondents offer paid vacation time while almost 70% offer health insurance. The lack of qualified trained labor could be a major impediments to business development as 78.8% of the respondents said that the lack of skilled labor prevents them from offering new products and services.

Weigh of regulations and taxes

For respondents, the largest challenges for the industry in the next five years are not the changes within the industry but exterior government pressures including taxes, regulations, and renewable energy mandates.

Economic contribution of Vermont fuel dealers to the state economy

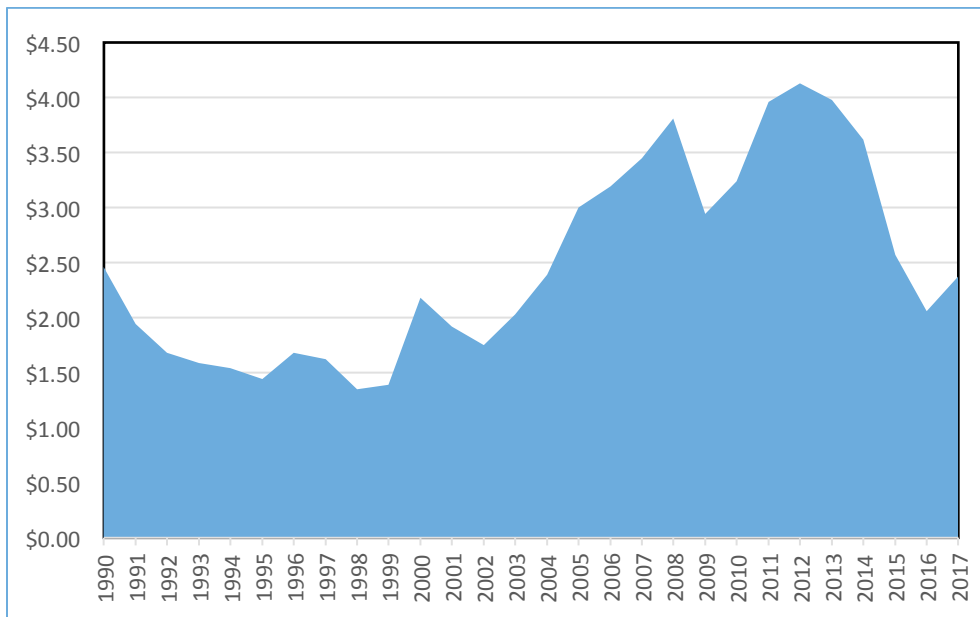
Based on extrapolations of the fuel dealer responses to the entire Vermont fuel dealers' sector, the Vermont fuel dealers support over 1,000 jobs and a little over \$100 million in economic activity. Though the contribution of the sector might appear limited, this is due to the fact that the sector sales a product that is manufactured outside the state. Nevertheless when accounting for the rippling effects, the fuel dealers support an additional 739 jobs and \$58 million in economic activity in Vermont.

Introduction

In July 2016, the Vermont Fuel Dealers Association (VFDA) contracted with the Center for Rural Studies (CRS) at the University of Vermont to conduct an industry assessment of Vermont heating fuel delivery and service companies and an economic contribution study. The study was conducted using a survey sent to heating fuel delivery and service companies in Fall 2016. After a brief introduction to the report, we describe how the study was conducted and present the findings.

The assessment of the Vermont heating fuel delivery and service companies comes during a time of transition in the home energy sector. Over the past three years, oilheat prices are the lowest they have been in decades with the price of heating oil sold in Vermont averaging \$2.37 a gallon in 2017. Adjusted for inflation, the price of oilheat is less in 2017 than it was in 1990¹ (Figure 1). At the same time, heating oil remains priced competitively with other heating fuels sold in the state². While both price of heating oil and heating degree days fluctuate from year to year (Figure 1 and 2), the overall trend for heating oil consumption in Vermont over the past ten years is downward. This is true for both commercial and residential accounts over the last several decades (Figure 3).

Figure 1. Residential Heating Oil average yearly price



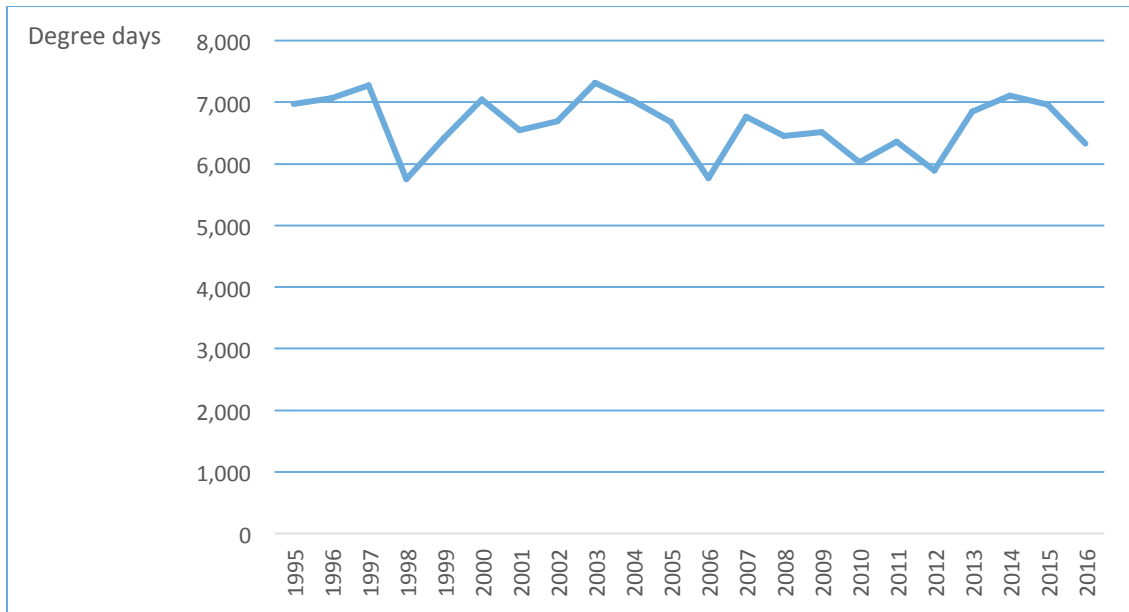
Notes. Prices adjusted for inflation base year 2017

¹ According to EIA, the average retail price of oilheat sold in Vermont in 1990 was \$1.29 per gallon, or \$2.46 in 2017 dollars. As of April 2017 the average yearly retail price of oilheat sold in Vermont is \$2.37.

² Vermont Public Service Department: http://publicservice.vermont.gov/publications-resources/publications/fuel_report

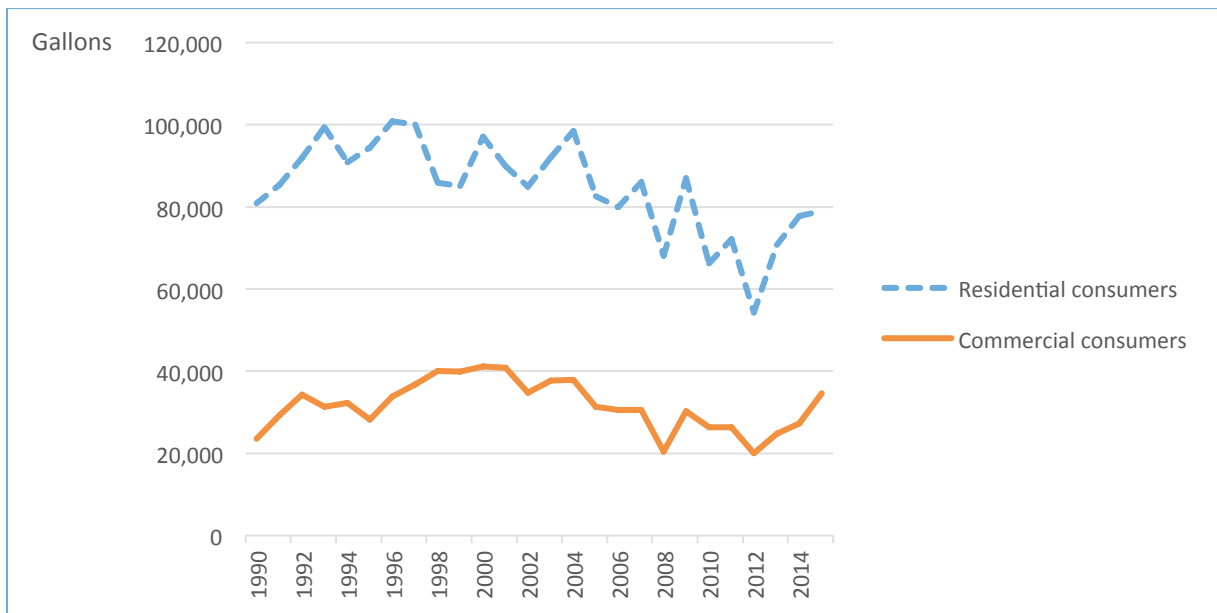
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Figure 2. Degree days at balance point 60 in Montpelier VT between 1995 and 2016



Notes. Data from the Weather data depot

Figure 3. Oilheat sold to residential and commercial customers in Vermont between 1990 and 2015



Notes. Data from U.S. Energy Information Administration

Conversions to other heating fuels, more energy efficient heating equipment, and advanced weatherization methods have contributed to the downward demand of heating oil in Vermont. It is likely that this consumption pattern will continue, requiring ongoing adaptation by the home heating industry to meet customer’s demands and expectations.

Study methods

Data Collection

In collaboration with VFDA, CRS designed a survey instrument to collect information from the Vermont heating fuel delivery and service companies. The goals of the survey were threefold: 1. get an updated profile of the Vermont heating fuel delivery and services, 2. assess how the sector is adapting to changing energy needs, and 3. measure the economic contribution of the Vermont fuel delivery sector. The survey instrument included questions on business duration and legal structure, types and amount of fuel sold, types of services provided, business revenue and expenses, employment levels and compensation offered, challenges faced, and future opportunities. The survey instrument is available in Appendix 1 (page 37).

VFDA provided CRS a mailing list of 315 businesses that sell heating fuel, heating equipment, or provide heating services in Vermont. A paper survey was mailed with a cover letter mid October 2016 to these 315 businesses. A second survey was mailed mid November and a reminder postcard was mailed at the end of November. To encourage survey responses, VFDA reached out to its member base. Out of the 315 survey mailed, approximately 34 were returned due to bad addresses, and a total of 52 completed surveys were returned leading to a response rate of 18.5%. It is important to note that the number of surveys returned does not constitute a representative sample of the Vermont heating fuel delivery and service sector. As a result, the results presented in this report cannot be generalized to the entire sector yet, we estimate that the businesses who responded to the survey represent 44% of the gallons of fuel sold in Vermont. Based on the responses, the survey is largely a survey of heating fuel companies with limited responses from equipment and service providers.

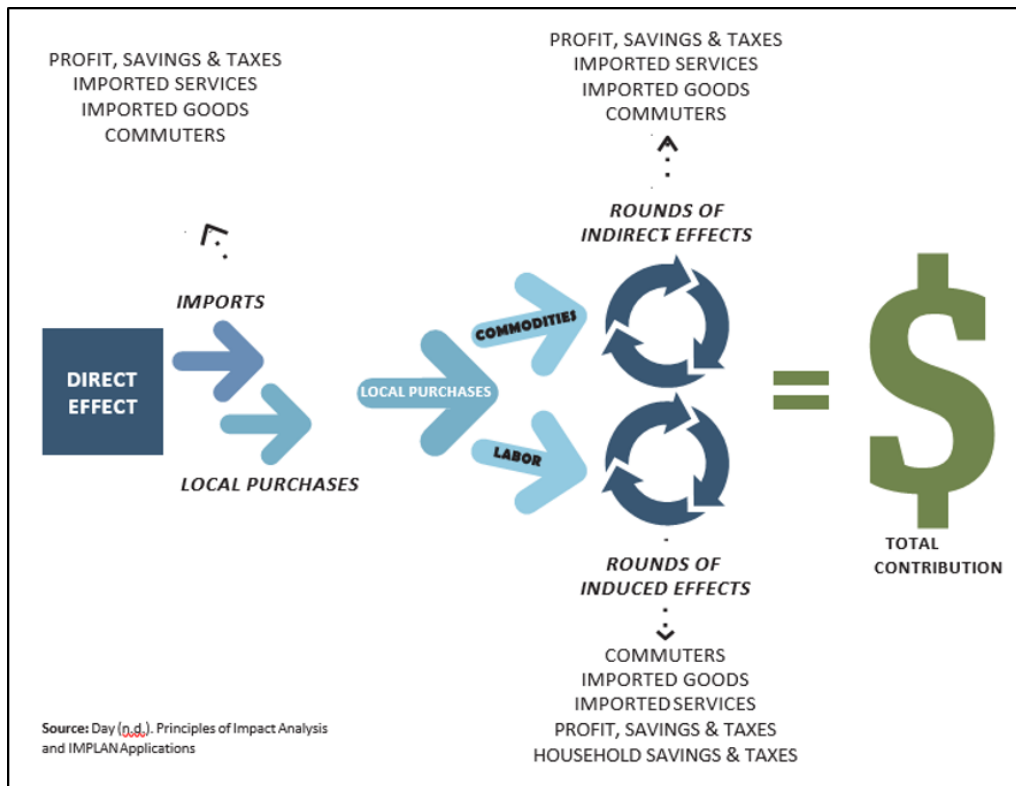
The study protocol including the survey instrument and data analysis plan were reviewed and approved by the University of Vermont Committee on Human Research in the Behavioral Sciences. This means that protocols were in place to ensure that the responses remained anonymous and the data collected were confidential. For instance, the data were stored electronically on a password-protected server at the University of Vermont. To protect the privacy and confidentiality of the respondents, no identifying information was collected from respondents.

Data analysis

Once the returned surveys were entered in a database, we conducted descriptive analysis to summarize the data. For questions where participants could write in an answer, we summarized the responses in categories. While we received some responses from providers from outside of the state, their responses are not included as the goal of the survey was to understand the importance of the Vermont heating fuel delivery and services sector to the state of Vermont. The number of respondents to each question is indicated in the text and in tables with the abbreviation 'n'. 'n' can be different from question to question as some respondents skipped questions, or in some cases certain questions did not apply to all respondents.

After conducting the descriptive analysis we conducted the economic contribution analysis of the Vermont fuel delivery sector. An economic contribution analysis measures the economic activity from existing businesses and industries and places a value on their contribution to study area, in this case the state of Vermont. This type of study calculates the amount of money that cycles through the local economy as a result of these businesses or industries including direct, indirect, and induced effects (figure 4). The direct effect results from the expenditures in goods, services, and labor associated with operating a fuel dealer operation. The indirect effect results from the suppliers of the fuel dealer purchasing goods and services and hiring workers to fill the order from the fuel dealer. For instance, the fuel wholesaler purchasing heating oil from the petroleum refinery and hiring truck drivers. The induced effect results from the effects of the changes in household income due to the economic activity from the direct and indirect effects. Here we are looking at how employees from fuel dealer or from the fuel wholesaler spend their paycheck, for instance, buying food at the grocery store or paying the mortgage on their house. The sum of the direct, indirect and induced economic activity that take place in the study area is the total contribution. An economic contribution analysis provides information on the economic activity associated with the industry’s sales, employee compensation, and proprietor income (profit). More information on economic contribution studies and the type of computer model used to conduct the data analysis can be found in Appendix 2 (page 37).

Figure 4. Graphical representation of the economic contribution of an industry



The economic contribution analysis was conducted only for the Vermont heating fuel dealers. Service providers are not included in the economic contribution analysis due to low response rate and lack of available data on the service providers’ industry as a whole. To get an estimate of the entire Vermont heating fuel dealers we used available data from the industry including the number of

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businesses categorized in sales volumes and survey data on gallons sold, and total sales to extrapolate the survey data to the entire sector. Table 1 shows the economic data for the survey respondents and the economic data for the entire heating fuel dealers sector based on the extrapolation. Note that in the survey, we asked for the 2015 data, which was the most recent full year at the time of the survey. We used the extrapolated sales data to conduct the economic contribution analysis of the Vermont heating fuel dealer sector.

Table 1. Fuel dealers’ economic data for survey respondents and for the entire Vermont heating fuel dealers sector

Average annual fuel sales in categories ¹	Fuel dealers’ sales
Survey respondents	
Less than 1.5 million gallons (n = 15)	\$84,865,891
Between 1.5 million and 5 million (n = 15)	\$98,242,436
Over 5 million gallons (n = 6)	\$87,795,955
Total	\$270,904,283
Vermont heating fuel dealer sector	
Less than 1.5 million gallons (n = 101)	\$253,399,405
Between 1.5 million and 5 million (n = 24)	\$153,834,240
Over 5 million gallons (n = 8)	\$146,120,800
Total	\$553,354,445

Notes. ¹Number of fuel dealers by size categories for Vermont was provided by VFDA. ² Employee compensation includes wages, salary, all benefits (e.g. health, retirement) and payroll taxes (both sides of social security and unemployment taxes).

The contribution analysis of the Vermont fuel dealer industry was conducted using the software IMPLAN (see appendix 2 page 37 for more information on the data analysis and use of IMPLAN software). Because fuel dealers distribute a product they purchase from wholesalers, we margined the economic activity of the fuel dealer sector. Margining means that we attributed the cost associated with producing and delivering propane and heating oil to the relevant sectors along the supply chain. As a result, the economic contribution analysis of the VT fuel dealers focuses on the retailing of these products namely, the purchase of the fuel from wholesalers by the fuel dealers and all the expenses they incur to deliver fuel to their clients. These expenses includes operating and equipment expenses, employee compensation, taxes, and proprietor income (profit). Results of the economic contribution analysis are available in the section titled ‘Economic contribution of the Vermont fuel dealers’ (page 20).

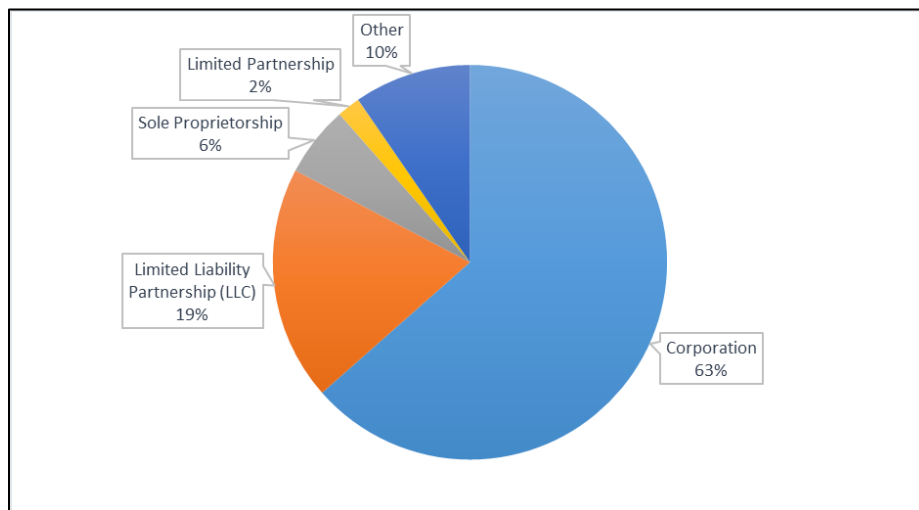
Study Results

General characteristics of the Vermont heating fuel delivery and service sector

In this section, we provide an overview of the responses of 52 Vermont heating fuel delivery and services sector including years in operation, business structure, business offerings, and economic characteristics.

The fuel dealers and service providers have been operating for an average of 45 years with a wide range of years in business from 3 to 129. Most respondents are structured as corporations (63.5%) followed by limited liability partnerships (19.2%), sole proprietorships (5.8%), limited partnerships (1.9%), and other business structures (9.6%) (figure 5). Out of the 52 respondents, 20.8% only sell fuel, 31.3% provide services only, and 47.9% sell fuel and provide home energy services such as installation and maintenance and repairs.

Figure 5. Survey respondents business structure



Other includes ¹ Company (2), S-Corporation (2), member owner cooperative (1)

The survey respondents operate at a broad range of scales, with total annual sales in 2015 ranging from \$150,000 to \$51 million in 2015 (table 2). The average total annual sales was \$7.5 million while the median average total sales was \$4 million indicating that a few businesses with very high sales

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skew the average somewhat higher. The average expenditures including capital purchases such as trucks, tanks, equipment, and material supplies, but not payroll, were \$3.7 million. Average employee compensation was slightly over \$1 million and median employee compensation was \$660,986. On average, 57.7% of the goods and services were purchased from Vermont based companies. The average taxes paid in 2015 were \$174,110 (median \$174,110) and the average charitable contributions was \$6,721 (median \$3,850).

Table 2. 2015 Survey respondents sales and expenditures, employee compensation, taxes, and charitable contributions

	Minimum	Maximum	Average	Median	Std. Deviation ²
Total Sales	\$150,000	\$51,000,000	\$7,527,260	\$4,000,000	\$9,722,166
Total Expenditures ¹	\$63,000	\$25,500,000	\$3,716,061	\$1,358,089	\$5,424,025
Employee Compensation	\$6,000	\$5,433,796	\$1,016,578	\$660,986	\$1,229,184
Charitable Contributions	\$0	\$40,000	\$6,721	\$3,850	\$7,929
Taxes	\$1,206	\$750,000	\$174,110	\$87,822	\$201,574

Notes: ¹ includes capital purchases such as trucks, tanks, equipment, material supplies BUT not payroll.

² Standard deviation is a measure of how dispersed the data are from the average. A larger standard deviation indicates more dispersal and more difference among individuals in a group. The standard deviation for each value is greater than the average, indicating a very high degree of variance. A few large businesses strongly impact the average of the overall industry, making it useful to also consider the median value to describe the “middle” size of the home energy sector businesses.

The number of full-time employees ranges from 0 to 87, with an average of 12.3 and a median of 7.5. The number of part-time employees ranges from 0 to 6 with an average of 1.1 and a median of 0.5. Employee positions include delivery drivers, service technicians, service managers, dispatchers, customer service representatives, and sales staff. Further information on employment in the home energy sector is provided in the ‘labor and compensation’ section (page 12).

Products and Services

The survey respondents offers a variety of fuel, equipment, and services to customers. This section describes the overall offerings and the percent of providers offering each type of fuel, equipment, and service. The most commonly sold fuels by fuel dealers are heating oil, propane, and kerosene while the heating oil and propane represent the largest quantities of fuel sold. Fuel dealers who responded to the survey sold on average 2.4 million of gallons of fuel while the median was 1.4 million of gallons indicating the fact that a small number of businesses sale a large volume of fuel (table 3). Indeed when we look at the number of businesses by size category at the industry level, 8 businesses sell over 5 million gallons per year while 101 businesses sell less than 1.5 million gallons per year (data provided by VFDA). When asked how the average home fuel consumption has changed over the last 5 years, 68.3% of the fuel dealers responded that the average annual fuel consumption of their customers has decreased.

Table 3. Gallons of fuel sold per year over the last 5 years by survey respondents

Fuel Type	n	Minimum	Maximum	Average	Median	Std. Deviation
Heating Oil	36	135,000	6,100,000	1,480,540	1,050,000	1,358,663
Kerosene	34	6,500	785,537	98,723	60,774	135,144
Propane	27	20,000	6,600,000	1,636,440	1,400,000	1,734,715
All fuels		20,000	9,816,000	2,400,950	1,450,000	2,312,959

Heating oil and kerosene are offered by over 80% of the survey respondents (table 4). Of these two fuels, heating oil provides a much larger percent of gross sales (47.7%) than kerosene (6.0%) to the businesses offering these fuels. Propane is offered by 63.2% of the survey respondents and contributes to approximately 35.2% of gross sales for the providers offering it. Biodiesel blended heating oil, wood pellets, and off-road diesel each contribute to less than 10% of gross sales for providers offering these products. Survey respondents also indicated selling clear UJSD, gasoline, on-road diesel, motor oil, coal, and lumber in 2015 in small proportions.

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Table 4. Products offered by fuel dealers and percent of gross sales

	Percent offering	Approximate percent of gross sales		
		Average	Median	Std. Deviation
Heating Oil	82.9	47.7	50.0	30.3
Kerosene	82.4	6.0	4.5	6.9
Off-Road Diesel	72.2	7.3	5.0	7.9
Propane	63.2	35.2	28.0	38.4
Wood Pellets	13.2	1.0	0.0	3.5
BioHeat	7.9	1.1	0.0	6.0
Other ¹	55.9	9.8	1.5	19.2

Notes: ¹Other includes: Clear ULSD; Gasoline; Diesel; Lumber & Service; Motor oil; Coal

In addition to delivering fuel, fuel dealers offer associated customer services (table 5). Heating system service, pre-buy programs, budget plans, and heating system inspections are offered by the greatest number of the survey respondents. Fewer than 20% of providers offer equipment financing, temperature monitoring, tank protection plans, and tank monitoring systems.

Table 5. Customer services offered by survey respondents

Customer services offering	Percent offering
Heating system service	71.2
Pre-Buy	63.5
Budget plan	63.5
Heating system installation	61.5
Tank inspection	55.8
Early pay discount	53.8
Service contracts	30.8
Price cap	28.8
Equipment financing	17.3
Temperature monitoring	15.4
Tank protection plans	11.5
Tank monitoring system	9.6

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Fuel dealers as well as service providers offer a variety of equipments, appliances, and energy audit services (table 6). Most offer fuel oil and propane furnaces and boilers and these accounts for 50.1% and 32.2% of gross equipment and appliances sales, respectively. Sales of cold climate heat pumps, wood pellet stoves, central air conditioning, solar hot water, and energy audits each make up less than 10% of gross equipment and appliance sales. In addition to the equipment and appliances listed in Table 6, 52.9% of the respondents reported selling cold climate heat pumps. The majority (70.8%) sell cold climate heat pumps for both the heating and cooling benefits while 20.8% sell them for the cooling benefit only, and 8.4% sell them for heating only.

Table 6. Equipment, appliances, and services offered by survey respondents

	Percent offering	Approximate percent of gross sales		
		Average	Median	Std. Deviation
Fuel Oil Furnaces and Boilers	83.3	50.1	51.5	34.8
Propane Furnaces and Boilers	79.1	32.2	30.0	31.7
Cold Climate Air Source Heat Pumps	46.3	8.4	0.0	13.8
Wood Pellet Stoves, Furnaces, and Boilers	24.4	1.9	0.0	6.6
Central Air Conditioning	17.1	2.7	0.0	5.8
Solar Hot Water	4.9	0.3	0.0	1.6
Energy Audits	7.3	0.4	0.0	1.7
Other	25.0	6.8	0.0	15.5

Notes. Other includes: "NG" boilers / furnaces; Energy upgrades; Gas Hearth Products; Wall heaters / generators; Hot water heaters; Natural gas equipment; Oil tank replacements; Rough in-house plumbing; Air conditioning.

Labor and Compensation

In this section, we provide information on the survey respondents' labor force including the number of employees, hourly rate, and benefits offered. The number of full-time employees by home energy businesses varies greatly (table 7). At the low end of employment are owner-operated businesses that do not have any full-time employees. At the high end are businesses with over 50 full-time employees. The maximum number of full-time employees for all respondents of this survey is 87. The Vermont home energy sector employs relatively few part-time employees compared to full-time. The maximum number of part-time employees by any respondents is 6, and the average is 1.1.

Table 7. Number of full-time and part-time employees

	Full Time employees					Part-time employees				
	Min	Max	Average	Median	Std Dev.	Min	Max	Average	Median	Std Dev.
Delivery Driver	0	21	3.1	2.0	4.1	0	4	0.56	0.0	0.98
Service Technician	0	24	4.3	2.0	5.3	0	1	0.13	0.0	0.34
Service Manager	0	2	0.67	1.0	.65	0	2	0.06	0.0	0.31
Dispatcher	0	9	0.83	0.0	1.6	0	1	0.06	0.0	0.24
Customer Service Representative	0	19	2.1	1.0	3.3	0	2	0.13	0.0	0.40
Sales Staff	0	8	0.42	0.0	1.2	0	1	0.06	0.0	0.24
Other ¹	0	19	0.90	0.0	3.5	0	3	0.10	0.0	0.45
Total	0	87	12.3	7.5	17.0	0	6	1.1	0.5	1.5

¹Other includes: Accountants/bookkeeping (3), apprentice (1), administrative worker (1), general/office managers (6), Energy audit/weatherization crew (1), mechanics (2), plumbers (2), operation/plant manager (2), utility worker (1)

As a sector, survey respondents spent \$44.2 million in employee compensation in 2015. Employee compensation per business ranged from \$6,000 to \$5.4 million with an average of \$1.0 million and a median of \$660,986. Compensation rates in the home energy sector in 2015 are presented in Table 8. Employee compensation is a significant expenditure for businesses and these businesses offer a wide range of pay rates. The average pay rate ranges from \$17.84 per hour (or \$37,107 per year for a 40-hour workweek) for consumer service representative to \$28.13 (or \$58,510 per year for a 40-hour workweek) for sales staff. Therefore, the average hourly rate reported by survey respondents is above the average per capita income for a person residing in Vermont in 2015 of \$29,894 (U.S. Census Bureau, 2015). Overall, compensation findings from this survey are consistent with the findings from the 2015 Vermont Fuel Dealer Survey based on the Gray, Gray & Gray Oil Heat Survey (2015). For instance, the Gray, Gray & Gray survey found that the average hourly wage for delivery drivers was \$16.21 per hour

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and the maximum reported wage was \$21.28 while in this survey, respondents reported that an average wage of \$19.85 per hour and a maximum of \$24.00.

Table 8. average hourly compensation rates

	Min	Max	Average	Median	Std Dev.
Delivery Driver	\$16.00	\$24.00	\$19.85	\$19.80	\$1.81
Service Technician	\$16.00	\$75.00	\$23.67	\$22.00	\$9.12
Service Manager	\$15.00	\$40.04	\$26.23	\$27.00	\$5.36
Dispatcher	\$15.00	\$32.00	\$21.45	\$20.05	\$5.14
Customer Service Representative	\$11.00	\$25.00	\$17.84	\$17.75	\$2.95
Sales Staff	\$13.00	\$50.00	\$28.13	\$27.15	\$10.58
Other ¹	\$15.00	\$43.76	\$25.38	\$21.90	\$9.74

¹Other include: Accounting/bookkeeper (2), apprentice (1), manager (3), plumber (2), utility worker (1)

In addition to offering a regionally competitive compensation, survey respondents offer a wide range of benefits (table 9). The five benefits that are most often offered are paid time off (94.2% of respondents), uniforms, gloves, and boots (86.5%), paid sick leave (80.8%), discount on products and services (71.2%), and health and other insurance (69.2%). Some businesses offer commissions for their employees including commissions to technicians for referrals (15.7%) and commissions to sales staff and to drivers for referrals (11.8%).

Table 9. benefits offered to employees by survey respondents

Benefits offered	Percent
Paid vacation time	94.2
Uniforms, gloves, boots, etc	86.5
Paid sick leave	80.8
Discount on products & services	71.2
Health insurance	69.2
Cell phone with private use allowed	55.8
Retirement plan	51.9
Disability insurance	44.2
Performance based bonuses	38.5

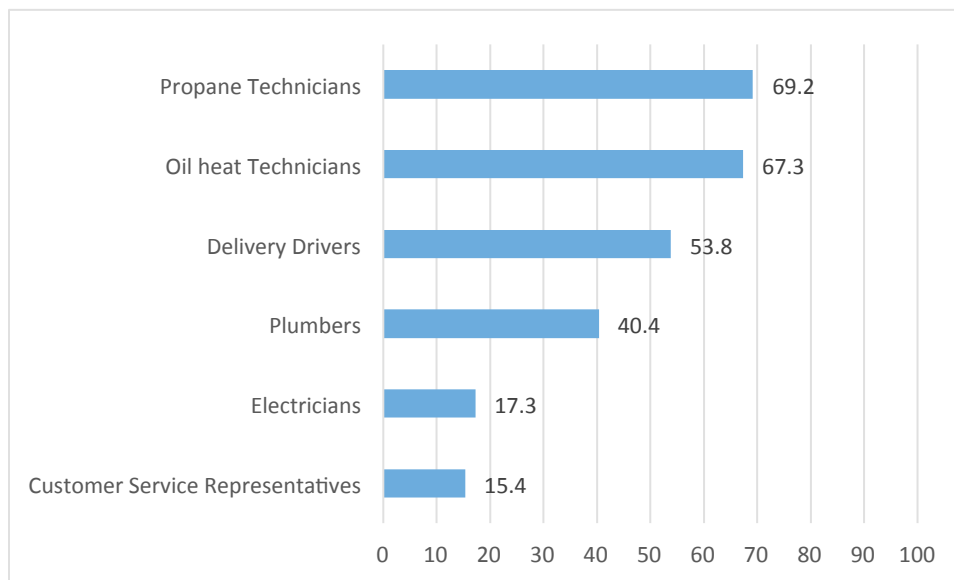
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Company vehicle with private use allowed	36.5
Life insurance	34.6
Dental insurance	28.8
Vision insurance	21.2
Profit sharing	19.2
Other ¹	5.8

¹Other include: health club membership (1) and tuition reimbursement (1)

Last, survey respondents were asked about the positions for which there is a lack of qualified applicants (figure 6). The biggest lack of qualified applicants is for propane and oil heat technicians (69.2% and 67.3% of respondents respectively), followed by delivery drivers (53.8%), plumbers (40.4%), electricians (17.3%), and customer service representatives (15.4%).

Figure 6. Positions with lack of qualified applicants



The changes in the Vermont heating fuel delivery and services sector and the adaptation strategies

In this section of this report, we present information on the changes in the Vermont heating fuel delivery and services sector including the impact on the sector and strategies used to adapt. As highlighted in the introduction, heating oil sales and consumption have fluctuated over the last several decades with an overall downward trend. The average per home heating oil consumption has been decreasing over the last 40 years, reaching an average of 590 gallons per home per year in 2010 versus 1,531 gallons annually in 1970 (U.S. Census Bureau, 2015; U.S. Energy Information Administration, 2016). The average consumption decreased by 61.4% from 1970 to 2010, and decreased by 19% between 2000 and 2010 alone. Survey respondents reported that the average annual heating oil use of their customers was 739 gallons while the average annual propane use was 881 gallons (table 10). The downward trend in fuel consumption per home was observed in the survey responses as 68.3% of the respondents reporting that home fuel consumption has decreased over the last 5 years, 22.0% reported it has remained the same, and 9.7% reported consumption has increased. At the same time, it should be noted that the number of homes heated by fuel oil in Vermont is higher in 2010 (122,786) than it was in 1970 (108,207) further highlighting lower consumption per home.

Table 10. Average annual primary heat fuel consumption per home

Fuel Type	n	Minimum	Maximum	Average	Median	Std. Deviation
Heating Oil	33	350	1200	739	750	180
Propane	22	240	1500	881	800	323

Survey respondents attributed the decrease in home heating fuel consumption to more efficient heating equipment (46.9%), supplemental heat from wood and pellet stoves (28.1%), and to a lesser degree to warmer winters (12.5%), and weatherization of homes (3.1%) (Table 11).

Table 11. Reasons that explain home heating fuel consumption decrease

	Percent
More efficient heating equipment	46.9
Supplemental heat from wood and pellet stoves	28.1
Warm winters	12.5
Weatherization	3.1
Other ¹	9.4

¹Other includes: Low volume dealer with small tanks and only do space heaters; All of the above; Unreasonable, irresponsible, government intervention – i.e. taxes and regulations.

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Despite reductions in per home heating fuel consumption, 56.1% of the survey respondents reported an increase in their customer list over the previous 5 years while 24.4% reported a stable customer list, and 19.5% reported a decrease. The reasons for customer list increases or decreases are listed in Table 12. It is unclear from the data whether the total of all combined fuel dealer customer lists has increased, or if the increase by one section of the industry is offset by a similar decline in the other.

Table 12. Reasons for changes in the customer list

	Percent
Increased due to increased advertising	21.2
Increased due to acquisition of competitor	7.7
Decreased due to conversion to natural gas	11.5
Decreased due to competitor	9.6
Decreased due to conversion to wood pellets	9.6
Decreased due to conversion to propane	5.8
Decreased due to electric cold climate heat pumps	5.8
Other ¹	44.2
Not applicable, customer list did not change	9.6

¹Other includes: increase in customer list due to good customer service (11), addition of propane (1), and word of mouth (4). Decrease in customer list due to changing customer habits such as shopping around for prices or buying in larger quantity when switching to propane (2), and customers moving away (2)

Cold climate heat pumps are a relatively new offering. These heat pumps collect heat from the outdoors and concentrate it with an outdoor compressor before distributing it indoors where the heat is desired. In the summer, the operation can be reversed to provide indoor cooling. Over half of the survey respondents reported selling or installing cold climate heat pumps (52.9%). The primary selling point for cold climate heat pumps is the ability of the unit to provide heating and air conditioning (70.8%) followed by the ability to use the heat pump for air conditioning (20.8%).

Survey respondents were asked about a list of products and services they are not currently offering but interested in offering (table 13). The largest numbers of respondents indicated interest in offering A/C installation and service (15.4%), biodiesel blended heating oil (15.4%), and cold climate heat pumps (13.5%).

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Table 13. Products and Services survey respondents are interested in offering

	Percent
Biodiesel Blended Heating Oil	15.4
A/C Installation & Service	15.4
Cold Climate Electric Heat Pumps	13.5
Plumbing	11.5
Solar Installations	9.6
Energy Audits & Weatherization	7.7
Propane	5.8
Wood Pellets	5.8
Heating Equipment	5.8
Heating Service	3.8
Heating Oil	1.9
Septic System Installation & Service	1.9

Table 14 lists the challenges the home energy sector reports facing in offering products and services in Vermont. The lack of skilled labor is the most significant challenge (78.8% of respondents), followed by lack of training for current employees (26.9%), cost of labor (26.9%), and lack of customer demand (11.5%)

Table 14. Challenges to Offering Products and Services for Vermont Heating Fuel Service Providers

Challenges	Percent
Lack of skilled labor	78.8
Lack of training for current employees	26.9
Cost of labor	26.9
Lack of customer demand	11.5

Other challenges noted: Customer lack of money for repairs/new installation; Doubt of payback and effectiveness of heat pumps and solar on behalf of consumer; Economy; Lack of hours in a day (too busy); Lack of inspectors/inspections (enforcement of the law); State of VT Taxes and insurance costs; Training Costs

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Looking at the industry as a whole, survey respondents were asked about the largest challenges to the home energy sector in the next 5 years (table 15). They reported that the largest challenges are taxes (80.8% of respondents), followed by government regulations (75.8%), and renewable energy mandates (55.8%). Lesser challenges include competing fuels (23.1%), and lower per home consumption (11.5%). A little over 20% of respondents reported additional challenges that were not listed such as climate change, other businesses not following the rules, health care costs, and lack of labor.

Table 15. Challenges for the industry in the next 5 years

	Percent
Taxes	80.8
Government regulations	78.8
Renewable energy mandates	55.8
Competing fuels	23.1
Lower per home consumption	11.5
Other ¹	21.2

¹Other: climate change (1), other businesses not following the rules (2), health care cost (3), lack of labor (5).

On the other hand, opportunities reported by survey respondents included expansion of the consumer base through increased coverage of territory (59.6% of respondents), diversification of product and service offering (48.1%), expansion of consumer base through competitor acquisition (23.1%) (table 16). Other opportunities include consumer service, increased sales and installations, and retirement.

Table 16. Opportunities for the industry in the next 5 years

	Percent
Expansion by increasing coverage territory	59.6
Diversifying into other products and services	48.1
Expansion through competitor acquisition	38.5
Biodiesel blended heating oil	23.1
Other ^a	17.3

^aOthers include: customer service (2), increased sales and installations (2), retirement (2)

Last, survey respondents were given the opportunity in the survey to share comments and nine choose to comment. When provided, contact information were remove to ensure anonymity of the respondents. Overall, the comments echoed the information presented in this report (table 17). A couple of the respondent talk about the difficulty to recruit workers due to lack of labor or cost despite

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the workload while another respondent talks about the difficulty to keep the business afloat due to a negative environment in Vermont towards the industry. Last, two comments are related to the evolving industry, one respondent talks about the need to adapt while another express his/her dissatisfaction with the use of public money to support an industry that effectively competes against him/her.

Table 17. Additional comments shared by survey respondents

Comments
Did not address that factor of new dealers coming in with cell phone and truck by passing fed and state spill protection regulations vs. companies with a tank farm
I am a small propane seller, installation and service company. Myself the owner being the only employee. I would like to expand and hire past one more employee but, most likely will not because of the costs and risks. As long as I can maintain current sales and income, I will remain a one person operation. My wife helps with the office work, payroll, AP, AR, invoicing, etc. but I cannot afford to pay her.
Rule enforcement inspections etc?
I'm a one man gas, oil, A/C service and installation company. I'm 52 years old and have endless amounts of work. I've been at it for 25 years- We need more young people getting into this and better apprenticeship programs and encouragement from schools and the state.
Fossil Fuels are necessarily being pushed out. Consumers are making these choices, in an increasingly aware market. We must adapt or become a fossil fuel ourselves.
Fight or Flight!-this is my struggle every day in a state that is anti-fossil fuels. Do I continue to grow a small family owned company that has existed for 50 years, supported countless families and always contributed back to its community and customers? or quit! I am a native Vermonter- I love my work, my employees and my customers-a big major company will not care about my neighbor the way I do! But I'm tired of fighting to work for a living!!
Thank you! Looking forward to the results.
It offends me that my tax dollars I pay in are being used to startup businesses to compete against me with alternative heat sources. If these alternative heat sources are so efficient and cost saving, there should be no need for the government to subsidize them. I appreciate that someones is trying to help our industry. The form is a little confusing. Some questions 5 years-others 1 year-
Vermont needs to encourage more trade schools. Work force is aging with few new ones.

Economic Contribution of the Vermont Fuel Dealers

In the last section, we present the results of the economic contribution analysis of the fuel dealer sector. As we mentioned earlier, economic contribution studies measure the level of economic activity that can be attributed to a sector, in this case the fuel dealers in Vermont. Furthermore, only economic activity that occurs in the state is included. The primer on economic contribution studies presented in appendix 2 (page 37) provides information on the type of effects (direct, indirect, and induced) and on the type of activities (employment, labor income, value added, and sales) measured in this type of studies.

To calculate the economic contribution of the entire Vermont fuel dealers sector we extrapolated the survey responses to the entire sector as explained in the methods section (page 4). When accounting for all effects of an economic activity (direct, indirect, and induced), the Vermont fuel dealer industry contributed \$258.3 million in total sales and \$159.5 million in total value added to the state economy in 2015 (table 18). The economic contribution of the sector might appear low considering the industry sales showed in table 1. This is due to the fact that fuel dealers purchase fuel from wholesalers (some located in Vermont and some not) and the fuel itself is produced in refinery out of state. Therefore the economic contribution of the Vermont fuel dealers sector is related to the margins that fuel dealers captures and the employment they support. As explained in the primer, the value-added number is a more accurate measure of the economic activity of an industry and it includes wages paid to employees, profit accrued by the business owner, dividends paid to investors, interests, or rents, and indirect excise tax as well the sales and excise tax paid by individuals to the government. Furthermore, the Vermont fuel dealer industry contributed \$77.2 million in labor income which includes employee compensation and owner profits and supported 1,838 jobs. Looking at the direct impact which represents the economic activity directly generated by the Vermont fuel dealers, the reader might notice discrepancies between the direct impact and the economic data used for the economic contribution analysis shown in table 1 on page 7. The discrepancy is due to the fact that when analyzing the economic contribution of a sector that does not produce the goods, it is necessary to remove the part of the economic activity associated with the production of goods sold. Nevertheless, the Vermont fuel industry supported 1,099 jobs within the sector and contributed \$46 million in labor income, \$101.9 million in value added, and \$158 million in sales.

Table 18. Economic contribution of the Vermont fuel dealer industry

	Employment ¹	Labor income ² (in \$)	Value added ³ (in \$)	Sales ⁴ (in \$)
Direct effect	1,099.7	46,056,693.0	101,985,671.0	158,431,907.0
Indirect effect	366.9	16,076,231.0	30,880,128.0	53,990,850.0
Induced effect	371.5	15,103,792.0	26,643,683.0	45,908,234.0
Total effect	1,838.1	77,236,717.0	159,509,481.0	258,330,991.0
Type 2 multiplier ⁵	1.7	1.7	1.6	1.6

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Notes: ¹Employment is the number of jobs derived from industry average output per employee. ²Labor income includes employee wages and owner profits. ³Value added is the best representation of economic activity and includes employee wages, owner profits, dividends and interests paid to investors, rent paid and, sales and excise tax. ⁴Sales include total sales revenue from associated industries, not the best representation of economic activity as it can include double counting. ⁵Type 2 multiplier = total effect / direct effect.

Another measure of the contribution of an industry is the multiplier effect. The total multiplier effect is calculated by dividing the total effect from the direct effect and it shows how much one dollar or one job in the initial industry, namely the fuel dealer industry, adds to the economy. We find that one job in the fuel dealer industry supports another 0.7 jobs through the rippling effects resulting from the initial economic activity. Additionally, \$1 in labor income in the fuel dealer industry supports another \$0.7 in labor income in the rest of the Vermont economy and \$1 in sales in the fuel dealer industry supports an additional \$0.6 in sales in the rest of the Vermont economy.

An economic contribution analysis also allows to analyze how individual industry sectors are impacted by the economic activity of the industry under study. In table 19, we show the ten sectors that are most impacted by the Vermont fuel dealers' industry activity. In this situation, the impact on these sectors is positive as the economic activity of the fuel dealers' supports economic activity in these sectors. The retail sector, which includes businesses doing home deliveries such as fuel dealers, and the wholesale sectors are by far the most impacted reflecting the economic activity of the industry. Economic activity in other sectors such as real estate, restaurants, and hospitals is most likely supported by Vermont employees in the fuel dealers' industry and Vermont employees providing goods and services to the fuel dealers industry spending their wages

Table 19. Top 10 sectors impacted by the economic activity of the Vermont fuel dealers' industry

Sectors	Employment	Labor Income (in \$)	Value Added (in \$)	Sales (in \$)
Retail including home delivery	778.6	23,724,826	60,284,408	93,017,929
Wholesale trade	326.2	22,035,736	42,142,363	65,786,523
Real estate	71.8	1,524,842	11,545,874	14,351,771
Full-service restaurants	27.8	607,878	691,209	1,368,712
Truck transportation	24.7	1,514,301	1,712,497	3,833,106
Hospitals	23.8	1,720,290	1,956,351	3,485,325
Warehousing and storage	23.3	910,885	1,150,181	2,200,042
Employment services	17.9	445,891	562,107	721,076
Couriers and messengers	17.3	678,319	1,041,177	1,773,638
Limited-service restaurants	15.9	370,430	570,463	913,041



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