

## Trends in Iowa Ethanol Blends Sales: E10, E15, E20, and E85 and the Biofuel Distribution Percentage

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Based on House File 2754 authorized by the Iowa General Assembly in 2006, Iowa has the goal that 25% of all petroleum used in the formulation of gasoline in the state be replaced by biofuels by 2020. Several refundable tax credits were enacted for biofuel retailers to assist in reaching this goal. Currently, Iowa biofuel retailers have four tax credits available: The Ethanol Promotion Tax Credit, the E85 Gasoline Promotion Tax Credit, the E15 Plus Gasoline Promotion Tax Credit, and the Biodiesel Blended Fuel Tax Credit (IDR, 2014).

Through the Ethanol Promotion Tax Credit (EPTC) biofuel retailers receive \$0.08 to \$0.04 per gallon<sup>1</sup>. EPTC was enacted January 1, 2009 and replaced the Ethanol Blend Gasoline Tax Credit, which expired December 31, 2008. E85 Gasoline Promotion Tax Credit (E85GC) was enacted on January 1, 2006 and gives a credit of \$0.16 per gallon. E85 requires dedicated pumps, and is for flexible fuel vehicles only.

E15 Plus Gasoline Promotion Tax Credit (E15GC) provides a credit to retail dealers who sell blended gasoline with 15% to 69% ethanol (E15 Plus). 2001 model year vehicles and newer have been allowed by the Environmental Protection Agency (EPA) to use E15, which is a blend up with 15% ethanol sold by registered E15 retailers. Blends with more than 15% ethanol or dispensed by nonregistered retailers can only be used in flex-fuel vehicles (FFVs) as FFVs can use any gasoline blended with up to 85% ethanol. The tax rate is \$0.03 per gallon from September 16<sup>th</sup> to May 30<sup>th</sup>, and \$0.10 per gallon during June 1 to September 15. According to the IDR (2017), the tax credit of \$0.10 per gallon during the summer time is designed to incentivize retailers to take the additional steps required to continue selling E15 through registered pumps year-round. Retailers can only continue to sell registered E15 during these months if they use low volatile gasoline for blending, which is not piped into Iowa.

Biodiesel Blended Fuel Tax Credit (BBFC) started on January 1, 2006. In calendar year 2013 through 2017, the tax credit equals \$0.045 per gallon for retailers offering a biodiesel blend with a minimum of 5% biodiesel (B5). The tax credit will be \$0.035 per gallon on B5 and \$0.055 per gallon on B11, or diesel blended with a minimum of 11% biodiesel for the 2018 through 2024 period.

### E10 Sales

Based on data from the Iowa Department of Revenue (IDR) published in the *Motor Fuel Monthly Report* the number of gallons of taxable ethanol-blended gasoline has varied throughout the years, but

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<sup>1</sup> According to the Iowa Department of Revenue (Iowa's Biofuel Retailers' Tax Credits- Tax Credit Program Evaluation Study, Dec. 2014) the tax credit rate depends on the size of the retailer and the difference between the biofuel threshold percentage and the retailer's biofuel distribution percentage. The biofuel threshold percentage progressively increases over the life of the tax credit from 6% for small retailers (200,000 gallons or less per year) and 10% for large retailers (more than 200,000 gallons per year), in 2009, to 25% for all retailers in 2020.

overall, gallons of taxable ethanol-blended gasoline have increased from 887 million gallons in 2002 to 1.150 billion gallons in 2016. In 2002 gasoline blended with 10% ethanol (E10) taxable sales were about 56% of total fuel taxable sales in Iowa. Gasoline-only taxable sales were about 44%. In 2016, the share of E10 taxable sales relative to total fuel taxable sales increased to 65% with a corresponding decline in the share of gasoline-only taxable sales to 35%, reflecting a strong demand for ethanol-blended gasoline in Iowa compared with gasoline without ethanol. January and February 2017 data indicates E10 ethanol blended gasoline represented 66% of taxable gallons of motor fuel sold during that period. Note that the gallon amounts published in this monthly report are at the supplier/terminal or rack level rather than at the retail level.

The IDR also publishes the *Retailers Motor Fuel Gallons Annual Report*, with data available starting in 2011. From 2011 to 2016, the number of retailers completing the annual sales report represented 88.4%, on average, of all Iowa retailers.

Based on these annual reports and as indicated Figure 1, 2016 Iowa E10 reported *retail* level sales equaled 1.347 billion gallons, up 2.1% from 2015. The blending that occurs between the terminal (wholesale) and the final consumer (retail) was estimated at 196 million gallons in 2016. The difference between wholesale and retail level sales started to increase in 2015 due to changes in the way rack level data was reported by suppliers.

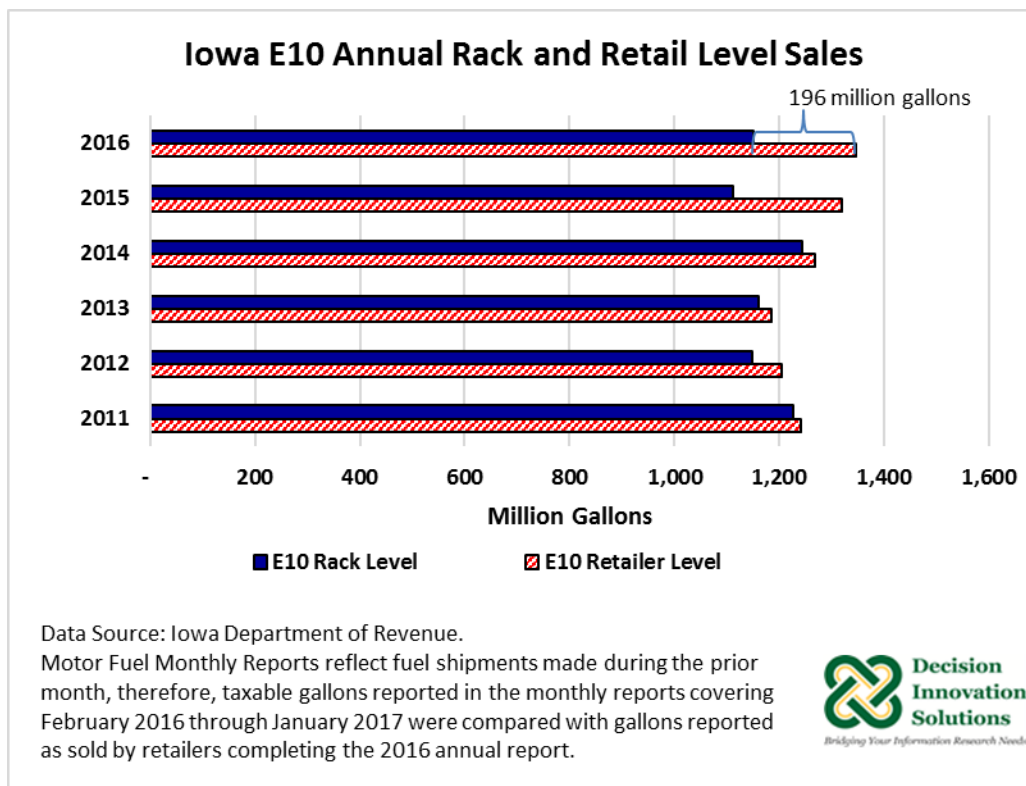


Figure 1. Iowa E10 Annual Rack and Retail Level Sales

## E85 Sales

Overall, most gasoline sold in the United States is an E10 blend. E85 (70% to 85% ethanol) can be used only in FFVs. Other blends such as E15 blend (15% ethanol blend) are limited by infrastructural and regulatory constraints. Fuel blends with more than 10% ethanol content are mostly marketed in the Midwest. As reported by the Iowa Renewable Fuels Association, there are about 300,000 FFVs owned by Iowa motorists. According to the U.S. Department of Energy, as of May 16, 2017, Iowa has 226 E85 fueling stations. Minnesota is the state with the most E85 fueling stations at 323 (Figure 2). Of the 226 E85 fuel stations currently in Iowa, 137 have blender pumps<sup>2</sup> that dispense mid-level ethanol-gasoline blends other than E85. The 226 E85 fuel stations are distributed across 79 counties, with Polk county having the most with 31 stations, 24 of which have blender pumps (see Figure 3).

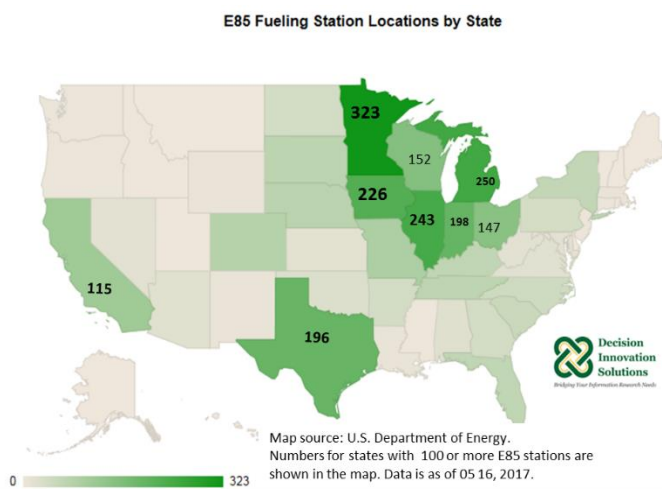


Figure 2. E85 Fueling Station Locations by State (as of May 16, 2017)

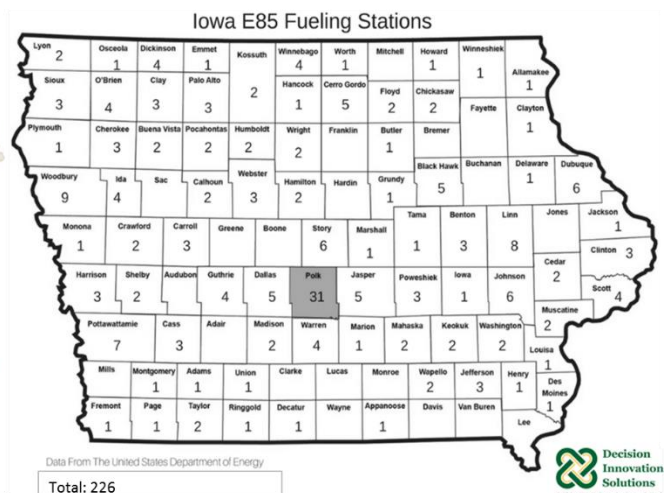


Figure 3. Iowa E85 Fueling Stations

As published in the IDR's *Motor Fuel Monthly Report*, Iowa taxable gallons of E85 sold at the wholesale level grew from 1.48 million gallons in 2006 to 6.0 million in 2016. There is additional blending of products throughout the fuel distribution chain and, in the case of E85, the monthly reported gallons sold at the wholesale/rack level are far below the gallons sold at the retail level, perhaps due to availability of retailers' blender pumps, in Iowa.

IDR's *Retailers Motor Fuel Gallons Annual Report* data indicates *retail* level sales of E85 fuel has been increasing since 2013 (see Figure 4). In 2016, Iowa E85 sales were up 2.4% to 13.5 million gallons, year over year. 2016 E85 sales increased 20.8% from 2013 (11.2 million gallons). Based on the reported wholesale and retail data, the additional blending of this fuel type occurring through the fuel distribution channel was about 7.5 million gallons in 2016 (see Figure 4).

<sup>2</sup> Multiple product dispensers (blender pumps) can combine multiple fuel streams at the dispenser in pre-programmed ratios.

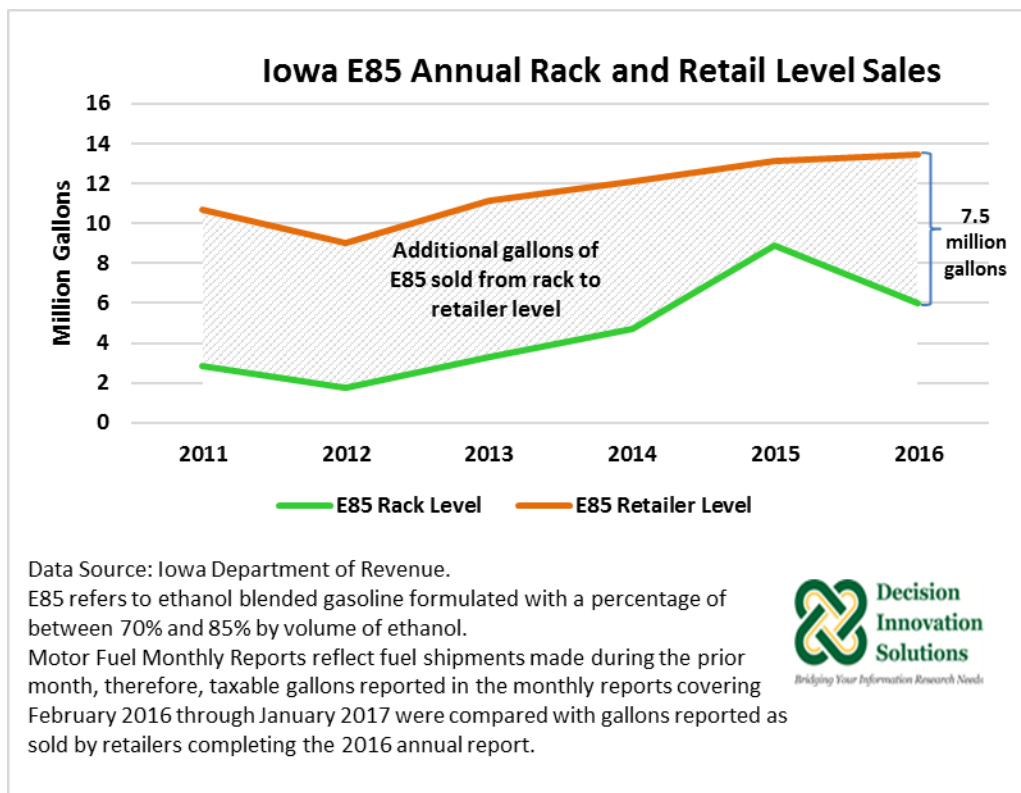


Figure 4. Iowa E85 Annual Rack and Retail Level Sales

### Other Ethanol-Gasoline Blends: E15 and E20

E15 and E20 sales published by IDR in the *Retailers Motor Fuel Gallons Annual Report* were reported together before 2015. Data in this category comprised gasoline blended with 15% to 69% ethanol. As indicated by IDR, due to the increasing E15<sup>3</sup> market in Iowa, ethanol blended gasoline with 15% ethanol is now reported as registered E15, which is sold by retailers registered with the EPA to sell E15 to 2001 and newer vehicles. During the summer months, E15 can only be sold as a flex fuel, unless retailers obtain low volatility gasoline for blending during those months (June 1<sup>st</sup> through September 15<sup>th</sup>). According to IDR, flex fuel E15 (15% to 19%) also comprises gallons sold by retailers through a blender pump at any time of the year.

Sales of E15 and ethanol blended gasoline with 20% to 69% ethanol (E20) have increased in Iowa since 2014 (Figure 5). 2016 flex fuel E15 and E20 sales rose 73.7% to 1.050 million gallons and 20.3% to 3.032 million gallons, respectively, relative to 2015. In contrast, registered E15 declined 11.9% to 4.951 million gallons in 2016, given that there are more restrictions in the sales of registered E15 during the summer time.

<sup>3</sup> According to the Renewable Fuel Association, E15 can be sold from a dedicated E15 dispenser or a dedicated E15 hose at a multiple fuel dispenser (blender pump). There are other options but some labeling and other rules need to be followed.

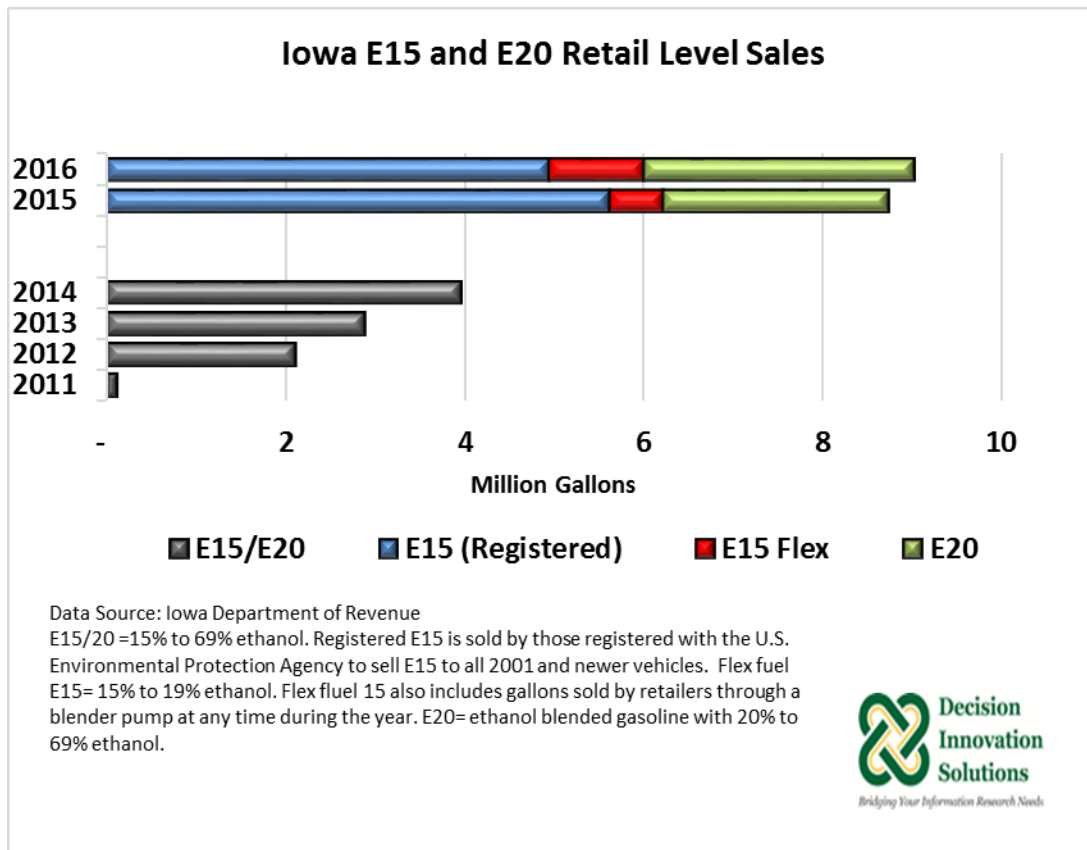


Figure 5. Iowa E15 and E20 Retail Level Sales

### Measuring Iowa Biofuel Distribution at the State and County Level

IDR estimates the biofuel distribution percentage based on the annual *retail* fuel data collected. The biofuel distribution percentage is a measure used to determine progress toward replacing 25% of the petroleum-based motor fuels with biofuels by the year 2020. According to Iowa law (Iowa Code 452.31(8), the biofuel distribution percentage estimate is based on each year’s aggregate ethanol gallonage (i.e., number of pure ethanol gallons sold by retailers), the aggregate biodiesel gallonage (i.e., number of pure biodiesel gallons sold by retailers) and the total gasoline gallons (pure gasoline (E0) plus ethanol-gasoline blends). This estimate does not include the gallons of diesel fuel in the denominator.

- Biofuel Distribution Percentage = (Pure Ethanol Gallons + Pure Biodiesel Gallons) / Total Retail Gasoline Gallons.

In 2016, the aggregate ethanol gallonage was up 2.1% to 146.8 million gallons compared with 2015, representing 9.2% of the volume of total gasoline and ethanol-gasoline blend fuel sales (1.589 billion gallons). 2016 pure biodiesel sales (46.712 million gallons) was 5.6% of diesel and biodiesel sales (841.550 million gallons). Pure ethanol and pure biodiesel combined (193.555 million gallons) comprised 8.0% of all fuel sales (2.430 billion gallons) in 2016. Using the formula described above which excludes diesel fuel in the denominator of the equation, the 2016 biofuel distribution percentage was 12.2% in Iowa, with three counties surpassing the 25% goal.

The counties replacing more than 25% of the petroleum-based motor fuels with biofuels were Fremont (40.7%), Guthrie (29.8%), and Poweshiek (26.1%) counties (see Figure 6). 2016 ethanol-gasoline blends sales at the retail level in Fremont represented 92.6% (4.656 million gallons) of 2016 total fuel sold (gasoline plus ethanol-gasoline blends) in the county (5.030 million gallons). In addition, the ethanol-gasoline blends sales for Guthrie and Poweshiek counties were 89.5% (5.130 million gallons), and 89.2% (12.394 million gallons) of their respective county total fuel sales (5.732 million gallons and 13.900 million gallons, respectively). On average, for the top 10 Iowa counties in biofuel distribution, ethanol-gasoline blends sales were 88.7% their total fuel sales. Despite these three counties exceeding the 25% biofuel goal, their county ethanol-gasoline blend retail sale shares of total Iowa 2016 ethanol-gasoline blend retail sales (1.369 billion) were very small. Fremont and Guthrie counties shares were 0.3% and 0.4%, whereas Poweshiek county share was 0.9% (see Figure 7). Figure 7 indicates that for the top 10 counties in biofuel distribution, most of the fuel they sell is in the form of biofuel blends, but their sales represent a small portion of the state ethanol-gasoline blend sales.

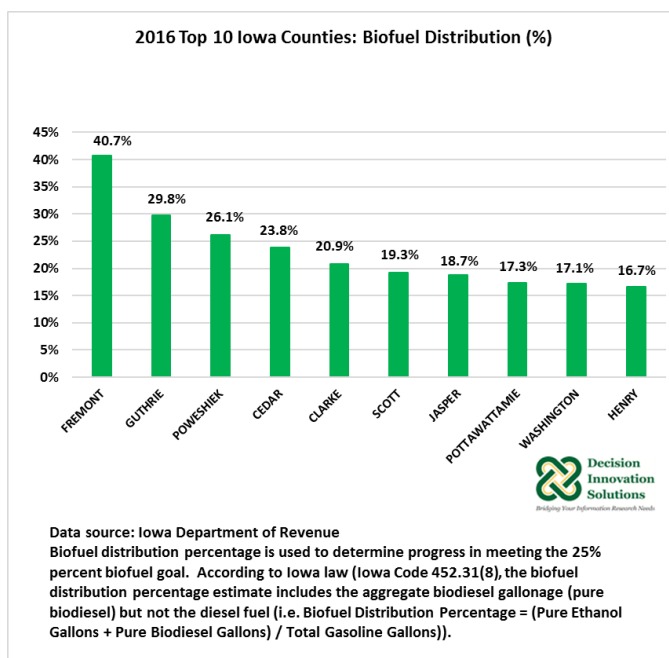


Figure 6. 2016 Top 10 Iowa Counties: Biofuel Distribution (%)

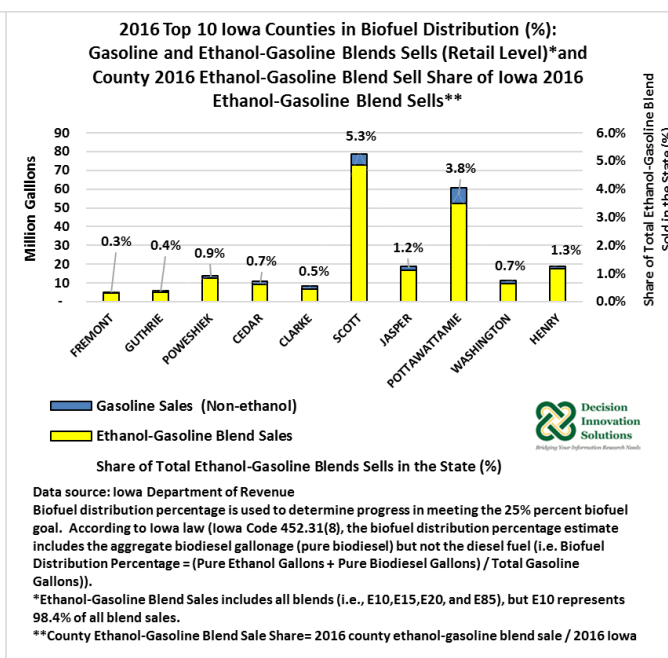


Figure 7. 2016 Top 10 Iowa Counties in Biofuel Distribution (%): Gasoline and Ethanol-Gasoline Blends Sold (Retail Level) and 2016 County Ethanol Gasoline Sale Share of Iowa 2016 Ethanol-Gasoline Blend Sales

As indicated in Figure 8, Polk County was the top county in fuel sales (gasoline plus ethanol-gasoline blends) in 2016 with 229.4 million gallons sold at the retail level, comprising 14.4% of total fuel sold at the retail level in Iowa (1.588 billion gallons). The 2016 volume of ethanol-gasoline blends sold in Polk County (193.718 million gallons) represented 84.5% of total gasoline plus gasoline-ethanol sales in the county (229.4 million gallons) and 14.1% of total ethanol-gasoline blends sold in the state (1.369 billion gallons) (see Figure 8). 2016 Biodiesel blend sales in Polk County reached a volume of 44.151 million gallons. Polk County biofuel distribution percentage was 12.0% in 2016 (see Error! Reference source not found. Figure 9). In 2016, only Scott County was in the top 10 counties for biofuel distribution

percentage (19.3%) progress (see Figure 6 and Figure 9) and in the top 10 counties in gasoline and ethanol-gasoline blend sales (see Figure 8). Scott County sold 78.733 million gallons of gasoline and ethanol-gasoline blend fuel at the retail level, with 92.7% (72.981 million gallons) of those gallons sold in the form of ethanol-gasoline blends. 2016 ethanol-gasoline blended fuel sold in Scott county represented 5.3% of 2016 total ethanol-gasoline blend fuel gallons sold in Iowa (see Figure 8).

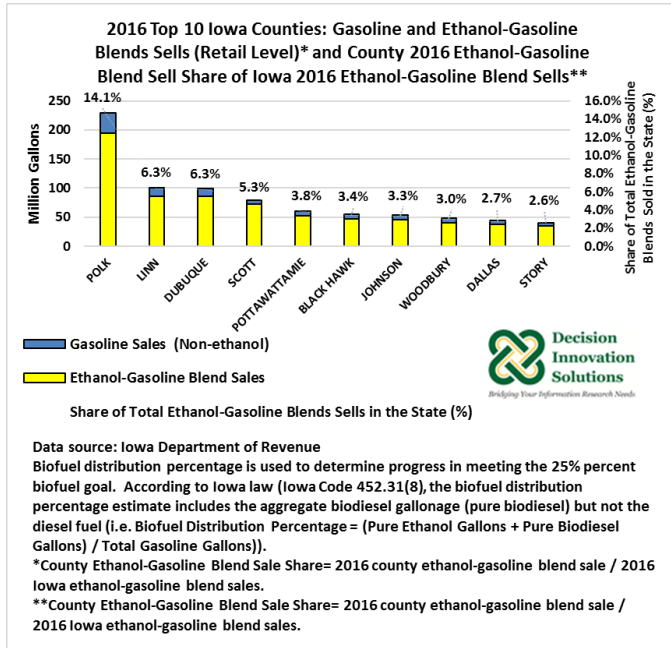


Figure 8. 2016 Top 10 Iowa Counties: Gasoline and Ethanol-Gasoline Blends Sales (Retail Level) and Share of Total Fuel Sold

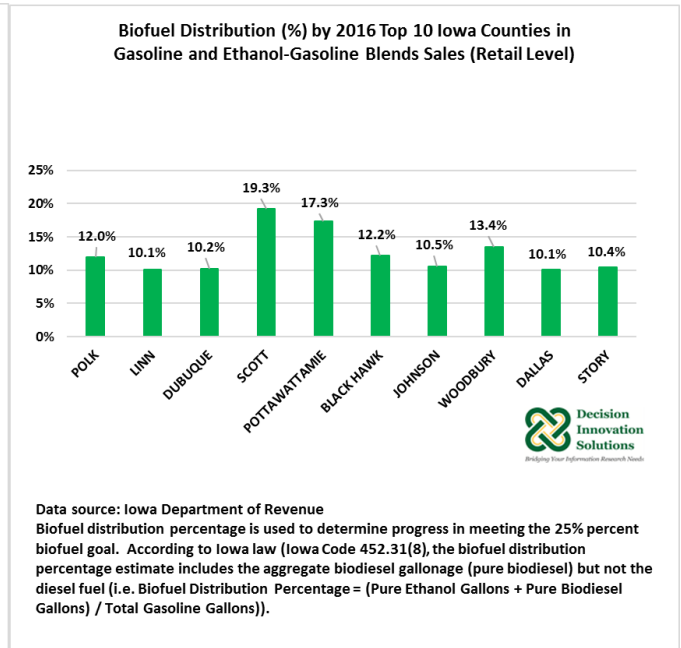


Figure 9. Biofuel Distribution by 2016 Top 10 Iowa Counties in Gasoline and Ethanol-Gasoline Sales (Retail Level)

Most of the gasoline sold in Iowa is in the form of an ethanol-gasoline blend. Mid-level blend sales have increased recently but E10 continues as the highest (by volume) ethanol-gasoline blend sold in the state. In 2016, 98% of gallons of ethanol-gasoline blends sold at the retail level were E10 blend fuel sales and only 2% were higher blend fuel sales. In 2016 the biofuel distribution percentage, which is used to determine progress in meeting the 25% percent biofuel goal by 2020, was 12.2% compared with 11.6% in 2015. The progress made toward this goal, as measured by the biofuel distribution percentage, remains low considering that there are only three more years to reach the goal. A proposed amendment to Iowa House Study Bill 187 would affect the Iowa biofuel tax programs by issuing credits only after annual sales amounts for fuel retailers were calculated. As reported in the April 20<sup>th</sup> edition of the [Biofuels Digest](#), petroleum marketers are concerned the policy change would result in less biofuel blended, rather than more due to the insecurity it could bring to the market.