



WISCONSIN LEGISLATIVE COUNCIL STAFF MEMORANDUM

Memo No. 8

TO: MEMBERS OF THE SPECIAL COMMITTEE ON DOMESTIC BIOFUELS

FROM: John Stolzenberg, Chief of Research Services

RE: Background Information on the State Renewable Fuels Program in WLC: 0368/4

DATE: March 11, 2009

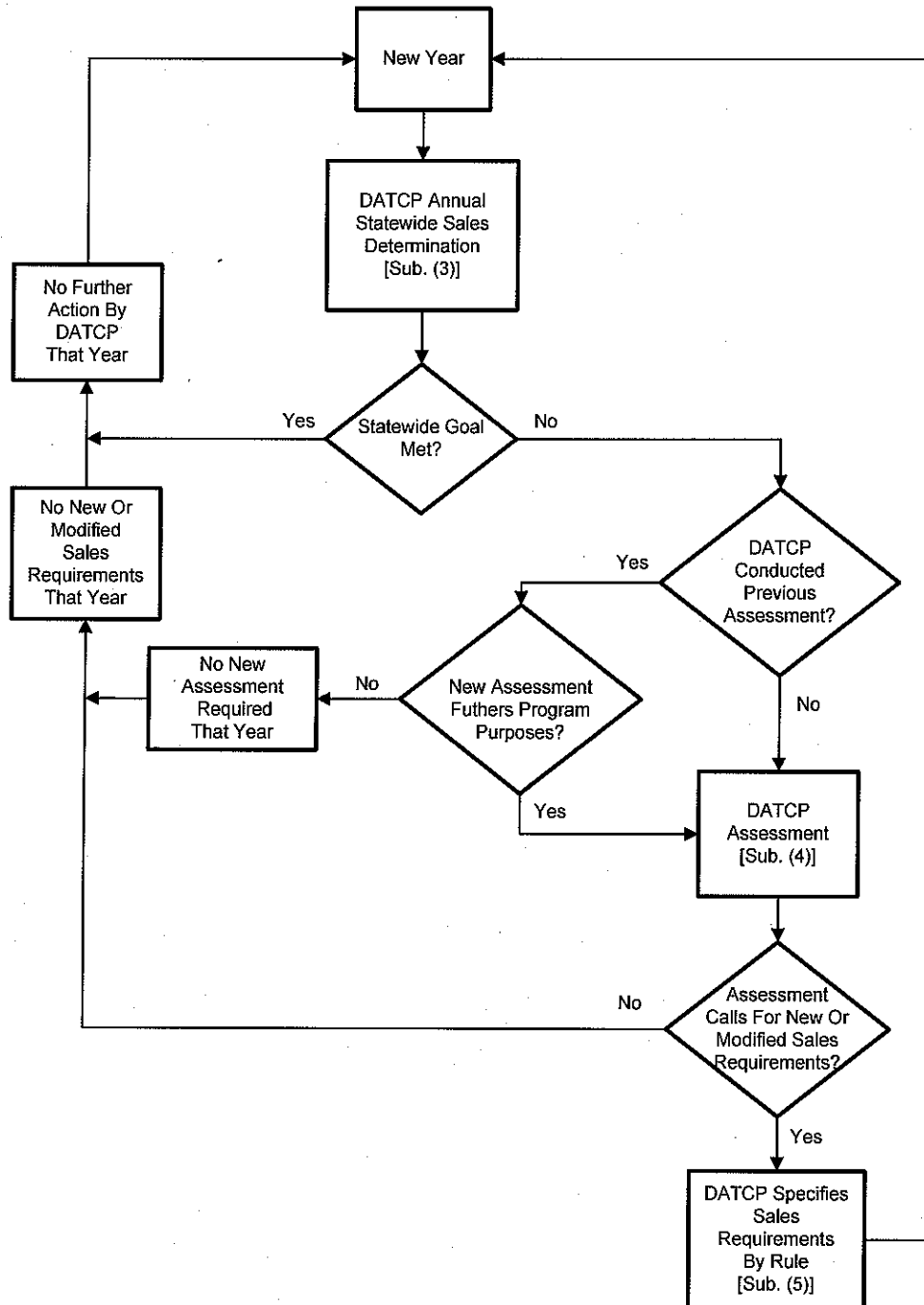
This Memo provides the following background information on the state renewable fuels program in WLC: 0368/4:

- A flowchart depicting the major steps in the implementation of the state program.
- Estimated Wisconsin gasoline-replacement renewable fuels sales volume and diesel-replacement renewable fuels sales volume by year.
- Formulas and sample step-by-step calculations of the Wisconsin gasoline-replacement renewable fuels sales volume and diesel-replacement renewable fuels sales volume.

Implementation Flowchart

The flowchart on the next page shows the major steps in the implementation of the renewable fuels program in WLC: 0368/4. This process applies separately to both the gasoline-replacement renewable fuels sales volume and the diesel-replacement renewable fuels sales volume in WLC: 0368/4.

**Implementation of the State Renewable Fuels Program
For Gasoline-Replacement Renewable Fuels and
Diesel-Replacement Renewable Fuels
Under WLC: 0368/4**



In this chart, "DATCP" refers to the Department of Agriculture, Trade and Consumer Protection, and "sub." refers to subsections in s. 100.60, as created by WLC: 0368/4, that are involved in the specified implementation step.

Estimated State Gasoline-Replacement and Diesel-Replacement Renewable Fuels Sales Volumes

The table at the top of page 4 provides an estimate of the annual state gasoline-replacement renewable fuels sales volume and diesel-replacement renewable fuels sales volume through 2012 based upon the definitions and formulas in WLC: 0368/4 and the following key assumptions:

- The values for the components of the federal renewable fuels standard remain at the amounts specified in the U. S. Code through this period. (These values are also provided in the table.)
- The computed value of the "state percentage of motor vehicle fuel sold nationally" remains at 1.83% during this period.

The first assumption implies that the EPA has not granted a waiver for one or more of these statutory values or otherwise adjusted the values under its authority under the federal law creating this federal standard between the present and 2012. Any significant EPA waiver would cause a reduction in the corresponding state renewable fuels sales volume.

With regard to the second assumption, the next section in this Memo provides information on the basis of the 1.83% value of the "state percentage of motor vehicle fuel sold nationally." WLC: 0368/3 authorizes DATCP to select the data sets, and any adjustments to the sets, that it will use in determining the value of this term each year. Thus, the department could choose to use data sets that differ from the sets used in preparing the values of the state volumes reported in the table. In addition, DATCP is required to compute this term annually based on the current data.

Given these uncertainties and the added uncertainty that the EPA must specify the federal biomass-based diesel volume after 2012 based upon statutory criteria, the table does not provide computed values of the annual state gasoline-replacement renewable fuels sales volume and diesel-replacement renewable fuels sales volume after 2012.

By way of comparison, the Office of Energy Independence (OEI) reported in its *2008 Wisconsin Energy Statistics* (page 19) that the total amount of ethanol blended into various types of gasoline-ethanol blended fuels used in Wisconsin and subject to the state excise tax in 2006 was 130.4 million gallons of ethanol and in 2007 was 161.2 million gallons of ethanol. A preliminary estimate of statewide ethanol usage in 2008 is 214.9 million gallons. The table in the middle of page 4 sets forth this statewide ethanol usage for 2007 and 2008 and the corresponding gasoline replacement renewable fuels sales volume for those years and 2009. OEI staff also report that in 2007, 809,000 gallons of B100 biodiesel blend stock was used in Wisconsin, with the great bulk of it apparently being used off-highway.

Estimated Federal and State Renewable Fuels Volumes by Year

Based on No Waivers or Adjustments to Federal Standards, and
Constant State Percentage of Motor Vehicle Fuel Sold Nationally = 1.83%

Year	Federal Standards ¹				State Goals Under WLC: 0368/4	
	Total Renewable Fuels	All Advanced Biofuels	Cellulosic Advanced Biofuels	Biomass- Based Diesel Advanced Biofuels	Gasoline- Replacement Renewable Fuels Sales Volume	Diesel- Replacement Renewable Fuels Sales Volume
Units	Billion Gal Per Yr	Billion Gal Per Yr	Billion Gal Per Yr	Billion Gal Per Yr	Million Gal Per Yr	Million Gal Per Yr
2006	4					
2007	4.7				95 ²	0.0 ²
2008	9				181 ²	0.0 ²
2009	11.1	0.6		0.5	213 ²	10.2 ²
2010	12.95	0.95	0.1	0.65	247	13.3
2011	13.95	1.35	0.25	0.8	264	16.5
2012	15.2	2	0.5	1	285	20.8

Statewide Ethanol Usage and Gasoline Replacement Fuels Sales Volume Under WLC: 0368/4 (Million Gallons Per Year)

Year	Statewide Ethanol Usage	Gasoline Replacement Fuels Sales Volume
2007	161.2	95
2008	214.9*	181
2009		213

* Preliminary estimate.

¹ 47 USC (o) (2) (B).

² This volume is included in the table to facilitate comparison with sales of gasoline-ethanol blends and biodiesel in Wisconsin in 2007 to 2009. If WLC: 0368/4 is enacted in 2009, the state goals would first apply in 2010. If it is enacted in 2010, the state goals would not apply until 2011.

Formulas and Sample Step-by-Step Calculations

This section sets forth the formulas that are the basis of the calculations of the annual state gasoline-replacement and diesel-replacement renewable fuels sales volumes in WLC: 0368/4. It also contains a set of sample calculations of these volumes for 2010.

Formula for Calculating the "Federal Diesel-Replacement Renewable Fuel Percentage"

$$\text{Federal diesel-replacement renewable fuel percentage} = \frac{\text{Federal biomass-based diesel volume}}{\text{Federal renewable fuel volume} - \left(\text{Federal advanced biofuel volume} - \left(\text{Federal cellulosic biofuel volume} + \text{Federal biomass-based diesel volume} \right) \right)}$$

Formula for Calculating the "Federal Diesel-Replacement Renewable Fuel Volume"

$$\text{Federal diesel replacement renewable fuel volume} = \text{Federal biomass-based diesel volume} + \left(\text{Federal diesel replacement renewable fuel percentage} \times \left(\text{Federal advanced biofuel volume} - \left(\text{Federal cellulosic biofuel volume} + \text{Federal biomass-based diesel volume} \right) \right) \right)$$

Formula for Calculating the "Federal Gasoline – Replacement Renewable Fuel Volume"

$$\text{Federal gasoline replacement renewable fuel volume} = \text{Federal renewable fuel volume} - \text{Federal diesel-replacement renewable fuel volume}$$

Formula for Calculating the "State Percentage of Motor Vehicle Fuel Sold Nationally"

$$\begin{array}{l} \text{State} \\ \text{percentage of} \\ \text{motor vehicle} \\ \text{fuel sold} \\ \text{nationally for a} \\ \text{year (YR)} \end{array} = \frac{\begin{array}{l} \text{WI motor vehicle} \\ \text{fuel}_{\text{YR-1}} \end{array}}{\begin{array}{l} \text{US motor vehicle} \\ \text{fuel}_{\text{YR-1}} \end{array}} + \frac{\begin{array}{l} \text{WI motor vehicle} \\ \text{fuel}_{\text{YR-2}} \end{array}}{\begin{array}{l} \text{US motor vehicle} \\ \text{fuel}_{\text{YR-2}} \end{array}} + \frac{\begin{array}{l} \text{WI motor vehicle} \\ \text{fuel}_{\text{YR-3}} \end{array}}{\begin{array}{l} \text{US motor vehicle} \\ \text{fuel}_{\text{YR-3}} \end{array}}$$

3

Formula for Calculating the "Gasoline-Replacement Renewable Fuel Sales Volume"

$$\begin{array}{l} \text{Gasoline-replacement} \\ \text{renewable fuel sales} \\ \text{volume in a specified} \\ \text{fiscal year (YR)} \end{array} = \begin{array}{l} \text{Federal gasoline} \\ \text{renewable fuel} \\ \text{volume}_{\text{YR}} \end{array} \times 1.1 \times \begin{array}{l} \text{State percentage of motor} \\ \text{vehicle fuel sold nationally}_{\text{YR}} \end{array}$$

Formula for Calculating the "Diesel-Replacement Renewable Fuel Sales Volume"

$$\begin{array}{l} \text{Diesel-replacement} \\ \text{renewable fuel} \\ \text{sales volume}_{\text{YR}} \end{array} = \begin{array}{l} \text{Federal diesel} \\ \text{replacement} \\ \text{renewable fuel} \\ \text{volume}_{\text{YR}} \end{array} \times 1.1 \times \begin{array}{l} \text{State percentage of motor} \\ \text{vehicle fuel sold nationally}_{\text{YR}} \end{array}$$

Where: Federal renewable fuel volume = Volume of "renewable fuel" for a given year in the federal renewable fuels standard (RFS).

Federal advantage biofuel volume = Volume of "advanced biofuel" for a given year in the federal RFS.

Federal biomass-based diesel volume = Volume of "biomass-based diesel fuel for a given year in the federal RFS.

Federal cellulosic biofuel volume = Volume of "cellulosic biofuel" for a given year in the federal RFS.

Federal RFS = 47 USC 7545 (o) (2) (B) (i)

US motor vehicle fuel = volume of motor vehicle fuel sold to end consumers in the United States and primarily used for transportation on public roadways in the specified year.

Wisconsin motor vehicle fuel = volume of motor vehicle fuel sold to end consumers in Wisconsin in the specified year.

Sample Calculations

The references in the sample calculations that follow are to provisions in the subsections in s. 100.60 created by WLC: 0368/4. Values of the federal advanced biofuel volume, federal biomass-based diesel volume, federal cellulosic biofuel volume, and federal renewable fuel volume for 2010 are taken from the values for these volumes in the table in the preceding section. All volumes are expressed in billions of gallons per year, unless otherwise noted.

Federal diesel-replacement renewable fuel percentage:

- Sub. (2) (c) 4. a. Subtract the sum of the federal cellulosic biofuel volume and the federal biomass-based diesel volume from the federal advanced biofuel volume: $0.95 - (0.1 + 0.65) = 0.20$
- Sub. (2) (c) 4. b. Subtract the amount determined under subpar. a. from the federal renewable fuel volume: $12.95 - 0.20 = 12.75$
- Sub. (2) (c) 4. c. Divide the federal biomass-based diesel volume by the amount determined under subpar. b.: $0.65 / 12.75 = 0.0510 = 5.10\%$

Federal diesel-replacement renewable fuel volume:

- Sub. (2) (c) 5. a. Subtract the sum of the federal cellulosic biofuel volume and the federal biomass-based diesel volume from the federal advanced biofuel volume: $0.95 - (0.1 + 0.65) = 0.20$
- Sub. (2) (c) 5. b. Multiply the federal diesel-replacement renewable fuel percentage by the amount determined under subpar. a.: $5.10\% \times 0.20 = 0.0102$
- Sub. (2) (c) 5. c. Add federal biomass-based diesel volume to the amount determined under subpar. b.: $0.0102 + 0.65 = .66$

Federal gasoline-replacement renewable fuel volume:

- Sub. (2) (c) 6. Subtract the federal diesel-replacement renewable fuel volume from the federal renewable fuel volume: $12.95 - .66 = 12.29$

State percentage of motor vehicle fuel sold nationally:

See the table in the Enclosure for data used to calculate this percentage. Due to the relatively small change in this percentage in the years covered by this table, the 2007 value of 1.83 % was assumed for the future years covered in the calculations of the annual state gasoline-replacement and diesel-replacement renewable fuels sales volumes summarized in the preceding section.

Calculation of 2007 percentage:

- Sub. (2) (c) 8. a. For the three years that preceded the year, divide the volume of motor vehicle fuel sold in this state by the total volume of motor vehicle fuel sold nationally: $3,278,097 / 176,195,920 = 1.86\%$ in 2005; $3,240,098 / 176,945,404 = 1.83\%$ in 2006; and $3,178,786 / 177,274,030 = 1.79\%$ in 2007
- Sub. (2) (c) 8. b. Add the quotients calculated in subpar. a. and divide by 3: $(1.86\% + 1.83\% + 1.79\%) / 3 = 5.48\% / 3 = 1.83\%$

Annual gasoline-replacement renewable fuels sales volume in 2010:

- Sub. (2) (a) 1. Multiply the federal gasoline-replacement renewable fuel volume for the year by 1.1: $12.29 \times 1.1 = 13.52$
- Sub. (2) (a) 2. Multiply the amount determined under subd. 1. by the state percentage of motor vehicle fuel sold nationally for the year: $13.52 \times 1.83\% = 0.247$ billion gallons per year = 247 million gallons per year

Annual diesel-replacement renewable fuels sales volume in 2010:

- Sub. (2) (b) 1. Multiply the federal diesel-replacement renewable fuel volume for the year by 1.1: $0.66 \times 1.1 = 0.726$
- Sub. (2) (b) 2. Multiply the amount determined under subd. 1. by the state percentage of motor vehicle fuel sold nationally for the year: $0.726 \times 1.83\% = 0.0133$ billion gallons per year = 13.3 million gallons per year.

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Enclosure

On-Highway Use of Gasoline and #2 Diesel¹
(Thousand Gallons per Year)

Year	2000	2001	2002	2003	2004	2005	2006	2007
On-Highway Gasoline (Includes Ethanol Blends)								
WI	2,509,003	2,512,697	2,558,687	2,503,499	2,477,857	2,576,718	2,483,022	2,419,804
US	129,527,254	132,029,187	135,164,172	135,392,918	136,265,680	138,142,791	137,827,103	137,472,286
On-Highway #2 Diesel								
WI	649,191	666,342	679,405	672,660	724,699	701,379	757,076	758,982
US	33,129,664	33,215,320	34,308,885	37,103,563	37,125,239	38,053,129	39,118,301	39,801,744
Sum of Gasoline and #2 Diesel								
WI	3,158,194	3,179,039	3,238,092	3,176,159	3,202,556	3,278,097	3,240,098	3,178,786
US	162,656,918	165,244,507	169,473,057	172,496,481	173,390,919	176,195,920	176,945,404	177,274,030
Ratio of WI Sum / US Sum								
	1.94%	1.92%	1.91%	1.84%	1.85%	1.86%	1.83%	1.79%
Ratio - 3 Yr Rolling Average								
			1.93%	1.89%	1.87%	1.85%	1.85%	1.83%

Source of Fuel Usage: Federal Energy Information Administration (EIA), *Petroleum Supply Annual*, Total Gasoline All Sales/Deliveries by Prime Supplier to On-Highway Use [Converted from Thousand Gallons per Day] - <http://tonto.eia.doe.gov/dnav/pet/hist/c100020551a.htm> and <http://tonto.eia.doe.gov/dnav/pet/hist/c100000001a.htm>; #2 Diesel Adjusted Sales/Deliveries to On-Highway Use - <http://tonto.eia.doe.gov/dnav/pet/hist/k2dvahsw1a.htm> and <http://tonto.eia.doe.gov/dnav/pet/hist/k2dvahnus1a.htm>.

¹ Liquefied petroleum gas (LPG) and compressed natural gas are also used as on-highway motor vehicle fuels in Wisconsin. Based on data in 2008 Wisconsin Energy Statistics, these uses are inconsequential compared to the volumes of gasoline, ethanol and diesel fuel and thus are not included in this table.