U.S. Jet Fuel Production Potential from Wastes

Summation: Wet wastes, FOGs, MSW, Ag & Forestry Residues, and Industrial Gases

- Wet Wastes (HTL): 3.8 Billion gpy
- FOGs (HEFA): 0.8 Billion gpy
- MSW (FT): 3.1 Billion gpy
- Agriculture Residues (FT): 6.1 Billion gpy
- Forestry Residues (FT): 0.4 Billion gpy
- Industrial Gases (ATJ): 1.3 Billion gpy

Current Total Potential ~ 15.6 Billion gallons of jet fuel per year
(approx. 59% of 2018 U.S. demand)

This is a working document and subject to change.
U.S. Jet Fuel Production Potential from Wastes
Wet Wastes – converted, e.g., via HTL

3.8 B gpy*

* Animal manure - 2.7 B gpy
* Wastewater sludge - 1.1 B gpy

*Removed FOGs and Food Waste from jet fuel calculation – FOGS assumed to go to HEFA and food waste to MSW/FT
Assumes a nearly 100% conversion rate from biocrude to jet fuel

U.S. Jet Fuel Production Potential from Wastes
FOGs– converted, e.g., via HEFA

823 M gpy*
(estimates vary)

* Inedible fats, oils, and greases (FOGs) (5.92M short tons/y)

https://fred.stlouisfed.org/series/M01218USM149NNBR
https://www.nrel.gov/docs/fy18osti/68470.pdf
U.S. Jet Fuel Production Potential from Wastes MSW – converted, e.g., via FT

3.1B gpy

* 137.7 million tons sent to landfill in 2015

Total MSW Landfill by Material, 2015 (137.7 million tons)

<table>
<thead>
<tr>
<th>Category</th>
<th>Potential Jet Fuel Production From Landfill (million gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>499</td>
</tr>
<tr>
<td>Wood</td>
<td>234</td>
</tr>
<tr>
<td>Food</td>
<td>332</td>
</tr>
<tr>
<td>Yard Trimmings</td>
<td>137</td>
</tr>
<tr>
<td>Plastics</td>
<td>1,527</td>
</tr>
<tr>
<td>Rubber, Leather, Textiles</td>
<td>733</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>3,462</strong>*</td>
</tr>
</tbody>
</table>

*Assumes all landfilled wastes are recovered and utilized

Galligan. CO2 emissions reduction potential of aviation biofuels in US.
Staples et al. 2018 Aviation CO2 emissions reductions from the use of alternative jet fuels
6.1B gpy

- Corn, wheat and soy 90% of cropland
- USDA 2019/2020 Projections for domestic production:
  - Corn 14,930 million bushels
  - Wheat 2,060 million bushels
  - Soy 4,090 million bushels

https://www.usda.gov/oce/commodity/projections/
https://www.usda.gov/oce/weather/pubs/Other/MWCACP/namerica.htm
381M gpy

* 70% of residues already diverted
* Total Unused Recoverable Residues = 15,334.362 thousand short tons
U.S. Jet Fuel Production Potential from Wastes
Industrial Gases – converted, e.g., via gas fermentation followed by ATJ

1.3B gpy*

* Steel Mills - 820M gpy
* Ferro-Alloy – 20M gpy
* Refineries – 500M gpy

Fossil Fuel Power Plants in the U.S.
Two most prominent sources are coal (black) and natural gas (orange)

https://www.visualcapitalist.com/mapped-every-power-plant-in-the-united-states/
* Communication with Dave Meyer, LanzaTech, August 5, 2019
For additional detail, please contact us at info@caafi.org

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