

CITY OF AMES
FLEET SERVICES

B100

Pilot Project

Presented by Rich Iverson
Fleet Support Manager

BEST
FLEETS™

nored as one of the 100 Best F

S - FLEET SERV



CITY COUNCIL

Climate Change Assumptions

- Climate change is real and primarily driven by human activity.
- The City of Ames is committed to creating a climate-friendly future by partnering with the community.
- The City of Ames is prepared to pursue policy changes that encourage and require carbon reduction behaviors.



Ames City Council's
Key Message

Investment in climate action contributes to Ames' economic development, in addition to generating co-benefits related to health, improved environment, equity, and economic growth.

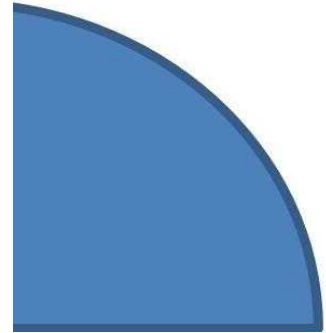
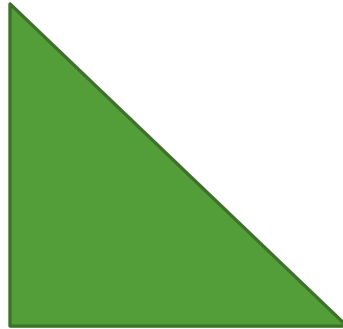
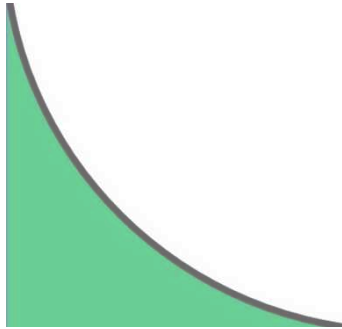
<https://www.cityofames.org/living/sustainability-in-ames>

City of Ames Fleet

- 21 Autos (2) Full Electric (5) Hybrid (5) E85
- 59 Pickups (29) E85 Gasohol
- 57 Vans and SUVs (11) hybrids (19) E85
- 44 Diesel Trucks (31)B20 **(12)B100** (1)B50
- 7 Fire Pumper/Ladder Trucks (7) B20
- 11 Light-duty Gas Trucks (all) E10 gasohol
- 10 Tractors (10) B20
- 4 Wheel loaders (2) B20 (2) Hybrid B20/Electric
- 75 Assorted equipment electric/gas/propane/diesel

Pilot Group B100 Trucks

Not all Climate Plans are Equal



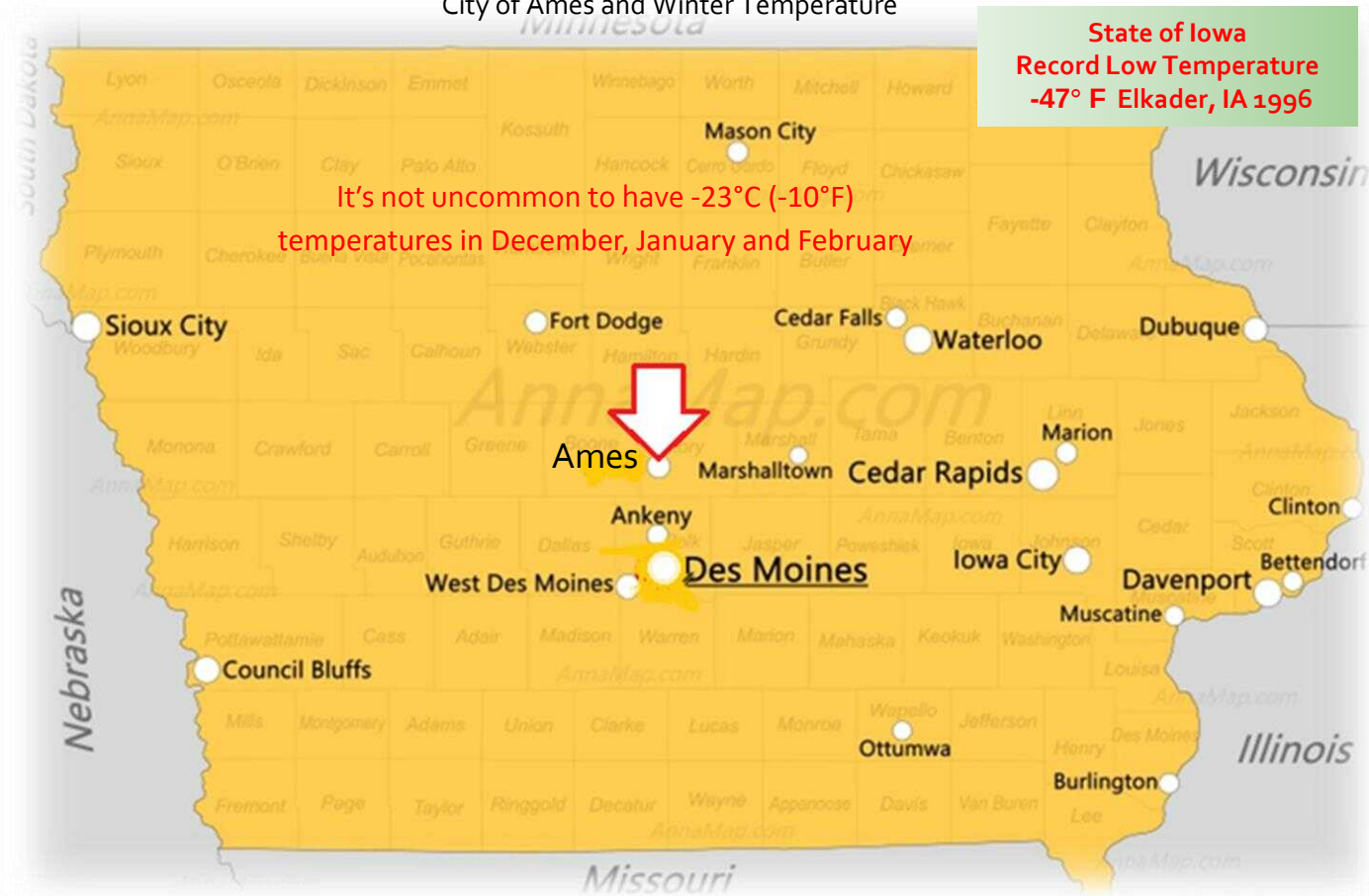
Example, all 3 plans depict reaching net-zero by 2050.

Blue plan leaves the most residual negative effects

City of Ames and Winter Temperature

**State of Iowa
Record Low Temperature
-47° F Elkader, IA 1996**

**It's not uncommon to have -23°C (-10°F)
temperatures in December, January and February**



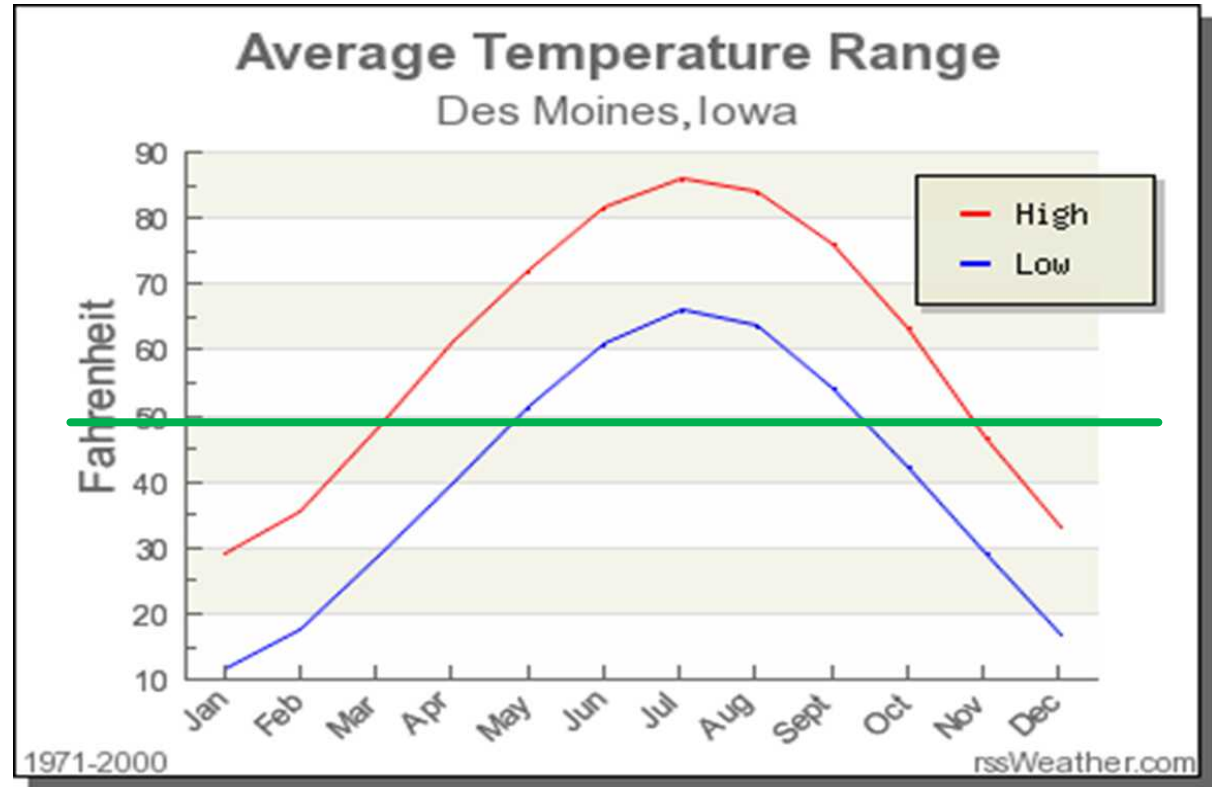
Ames' Biodiesel Plan Without Added technology

Avg. temps
above 50° F

B20

Below 50° F

B5



Before the Pilot Project

- 20 % biodiesel April – September
- 5 % biodiesel October – March
- 8 % biodiesel 5 pilot trucks avg.



Project Parameters

5 pilot trucks
information before the
B100 Project

Miles Driven	118,528
Hours	12,087
Idle Hours	6301
Percent Idle Hours	52%
Estimated Idle Gal	9451.4
Total Gallons	31,282
Biodiesel Gallons	2,619
MPG	3.79
MPH	10
GPH	2.63

- Idle hours include cue time for loading time and asphalt operations where truck can be stationary or moving in active service.

Trucks are used year-round working road maintenance in warm months and snow removal in winter



B100 Pilot Project

October 2019

City of Ames entered into a unique partnership with Renewable Energy Group and Optimus Technologies to conduct a 3-year pilot project to equip five City snowplow trucks with new technology enabling the trucks to use 100% biodiesel during normal operations - even in winter conditions.



Possible through a unique partnership with REG & Optimus Technologies

Rich Iverson Fleet Support Manager - City of Ames, Iowa

What do I need to begin using B100 year-round even in a cold climate?

- Diesel truck or Equipment
- New or Used
- B100 fuel source
- The right technology

Pictured: Diesel vehicle
before being equipped with
Optimus Vector System



What Infrastructure Changes are Required to Run on B100?

- Fuel storage tank(s) and dispensing infrastructure as for ultra-low-sulfur diesel.
- A heated tank will be required for above ground B100 supply in the winter.
- Some underground tanks may also require heating.

12,000 Gallon B100 Fuel Tank and Dispenser

Heated



Opportunity

Solar Heating

Underground Storage

Increase Volume





Optimus Technologies Installation

Pictured above: Shows the new 60/40 split tank installed on the truck, replacing the old tank, removed, shown resting the floor.

To the right: Shows this Optimus Vector unit conveniently installed outside the cab on the back wall.





Truck #967
New in August 2016



Truck #967 in January 2020
with new split tank and
Optimus Vector being
installed



5 trucks equipped with
Optimus Technologies'
Vector Systems just in
time to plow snow in a
January blizzard.

Temperatures fell to **-10°F.**

Used **90% biodiesel**,
nearly 1,000 gallons in 3
days without issue.

Operators reported normal
power and performance.

Pilot Project Begins January 2020



Truck #

City of Ames Snow Removal Operations 1.17.20-1.18.20

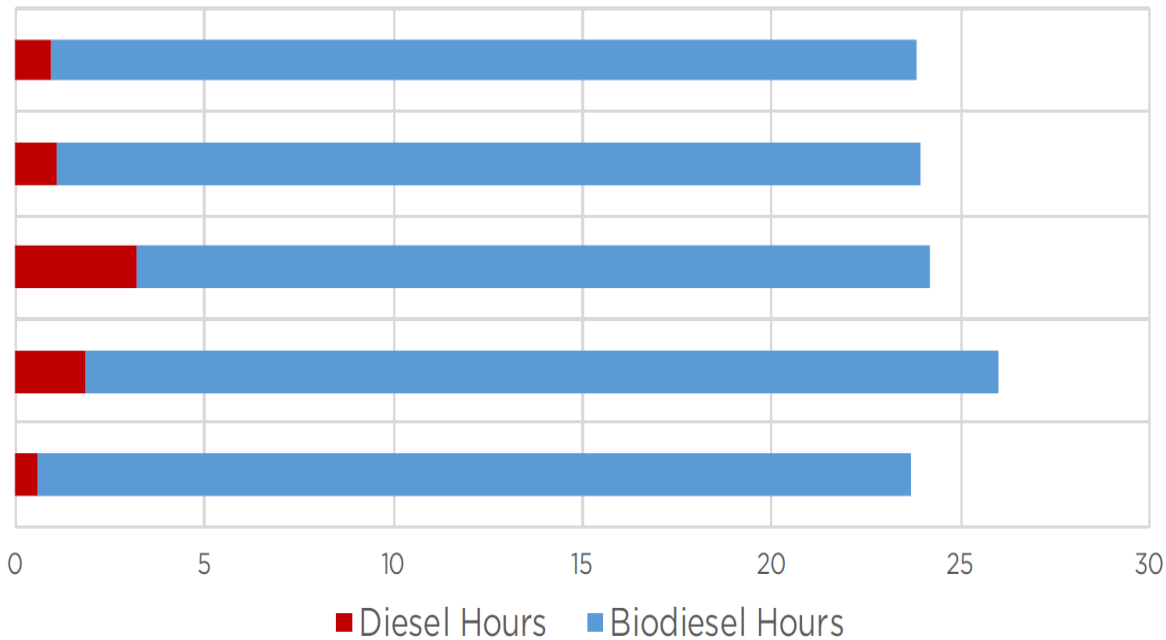
979

977

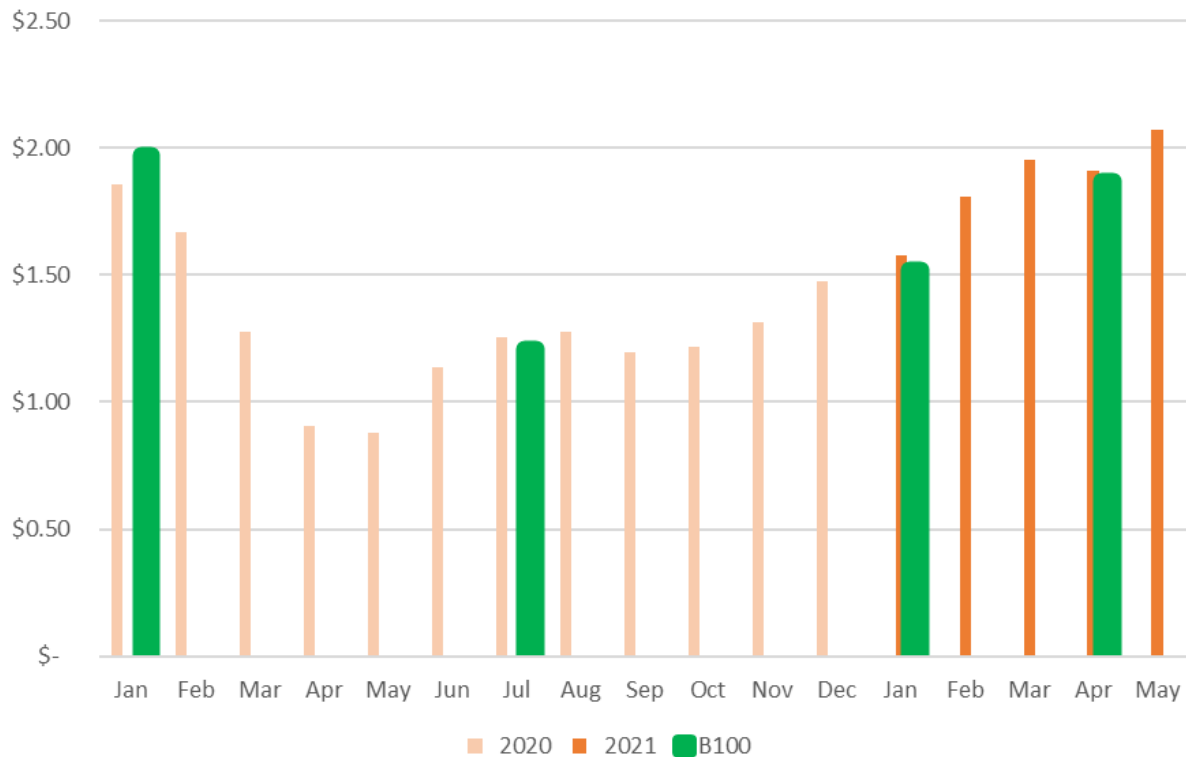
967

934

933



B99.9 Biodiesel Purchases Compared to Fuel Wholesale Price Diesel #2



12,000 Gallon Above Ground Storage

- Leased tank through fuel provider
- Carbon equivalent to 2 avg. Ames households (10.21 tons of CO₂)
- More biodiesel use lowers heating cost/gallon
- City of Ames generates electricity from solar, wind and natural gas

Pilot Project Midway Findings

- Biodiesel 84% avg.
- Fuel economy 7% lower MPG
- No performance issues
- Fuel heating cost 17 cents/gallon (above ground)
- 156 metric tons CO₂ offset



Thank you!

I encourage you to visit CityofAmes.org and see what the City is doing

- Rich Iverson, Fleet Support Manager
- City of Ames, Iowa
- Rich.Iverson@cityofames.org

- Year 1 Actual: 5 trucks, 10,500 gal. B100 = 103 MT ↓
- Year 2 Projected: 12 trucks, 25,000 gal. B100 = 248 MT ↓
- IA DOT to fill truck from City B100 tank

<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>



Put simply, fleets are facing growing pressure to reduce their carbon footprints. That's the primary driver of interest in B100 biodiesel, which can:

- Emit 94% less fossil carbon than ULSD
- Emit 92% less fossil carbon than compressed natural gas
- Emit approximately 80% less fossil carbon than a heavy-duty electric vehicle using average U.S. grid electricity*