HOW CAN ENVIRONMENTAL SUSTAINABILITY BE APPLIED TO EQUINE VENUES & EVENTS?

American Horse Council Annual Conference 2023 Colorado State University, Equine Sciences





TODAY'S DISCUSSION

- MEET YOUR PRESENTERS
- CURRENT SUSTAINABILITY PRACTICES
- HELSINKI INTERNATIONAL HORSE SHOW
- MANURE CONVERTED TO USABLE ENERGY
- HOW CAN THIS ENERGY BE USED?
- TULSA STATE FAIRGROUNDS
- **TULSA COUNTY'S HOUSEHOLDS?**
- MOVING FORWARD

HOW MUCH MANURE COULD ANNUALLY POWER



VANESSA ROY

- Senior, Equine Sciences
- CSU Horse Judging Team

MEET YOUR PRESENTERS







JESSICA STOCK ARRANDALE

- Senior, Equine Sciences
- Board Secretary, Klettafjalla Icelandic Horse Club
- Former Costco Wholesale Manager

CURRENT SUSTAINABILITY PRACTICES



Recycle Materials





Water Refill Station to Reduce Plastic Waste



Reduce Water Usage

Reduce Packaging



Manure to Generate Energy

YES, YOU HEARD THAT CORRECTLY!



MANURE CAN GENERATE ENERGY TO BE UTILIZED BY THE SURROUNDING COMMUNITY.

And Finland's Helsinki International Horse Show is doing just that!



WHAT IS THE HELSINKI INTERNATIONAL HORSE SHOW'S BIG IDEA?

Through a partnership with Finnish energy company, Fortum HorsePower:



Over 168 Megawatt hours of energy generated from 112 tons of collected manure over an average 4-day event!

HOW IS MANURE CONVERTED To usable energy?

Fortum provides sustainable wood shavings made from local forestry by-product to local stables

Fortum picks up and removes the manure from stables Manure is burnt and converted at the power plant to usable energy, along with other forestry materials



Usable energy is sent to the national energy power grid to be utilized by local communities

WHAT IS THE ENERGY USED FOR?

POWER TO THE LOCAL COMMUNITY

Two horses produce enough daily manure to generate heat for a single family home for an entire

year!

POWER TO ELECTRONICS

Just 0.2 deciliters of manure will charge a phone.

The energy produced was enough to power the entire event's electrical needs: lighting, heating, scoreboards, and cellphone charging stations.

POWER TO EQUINE EVENTS

TULSA STATE FAIRGROUNDS **COURTESY OF BRANDI** HERNDON, CHIEF **AGRIBUSINESS OFFICER**

THE HIGHLIGHT NUMBERS

- 19,174

- 153,392
- 2,377 tons

• Number of stalls leased annually:

 Number of days in stall: 3 to 4 • Number of horses per four-day events for the entire year: 76,696 • Total estimate of manure and urine waste: 306,784 lbs or 153 tons • Total number of shaving bags used:

• Weight of dry shavings: 2,300 tons • Total estimated weight of waste, including shavings: 4,755,152 lbs or

WHAT COULD THE HELSINKI MODEL MEAN FOR U_S_ VENUES LIKE THE TULSA STATE FAIRGROUNDS?

THE BASICS

- Annual energy usage for households = 10,632,450 Watts or 10,632 Kilowatts or
 - 10.6 Megawatts
- 1,000 Watts = 1 Kilowatt
- 1,000,000 Watts = 1 Megawatt

THE APPLICATION

The Tulsa State Fairgrounds' horse events produce 153 tons of manure over an entire year, with the potential to generate upwards of 200 Megawatts. This energy can provide power and heat to an estimated 22 households annually!

MOVING FORWARD

THE BIOGAS SYSTEMS INFRASTRUCTURE ALREADY EXISTS IN THE UNITED STATES! IN FACT, THERE ARE ALREADY 2,300 SITES ACROSS OUR 50 STATES, WITH 39 SITES LOCATED AT THE OKLAHOMA-TEXAS **BORDER!**

AMERICAN BIOGAS COUNCIL

THE ENVIRONMENTAL AND ECONOMIC IMPACT OF BIOGAS SYSTEMS

If the systems are fully utilized: **Environmental Impact**

- 103 trillion Kilowatt hours of electricity could be generated each year
- Emissions reduction equivalent of removing 117 million passenger vehicles from the road Economic Impact
 - Estimated \$45 billion in capital deployment for construction activity
 - 374,000 short-term construction jobs
 - 25,000 permanent jobs to operate the systems

https://tinyurl.com/yc4ba92x





EQUINE SCIENCES COLORADO STATE UNIVERSITY

VANESSA ROY

Vanessav@colostate.edu

JESSICA STOCK ARRANDALE Jessica.stock@colostate.edu