

Innovating Efficient & Reliable Energy Transmission



Team 44: The TAACO Toucans



MEET THE TEAM



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The Texas Winter Freeze

The Solution

Efficient
Transmission
Materials

Sustainable
Grid
Layout



1

Power Line DRONES

Eliminating Energy Waste

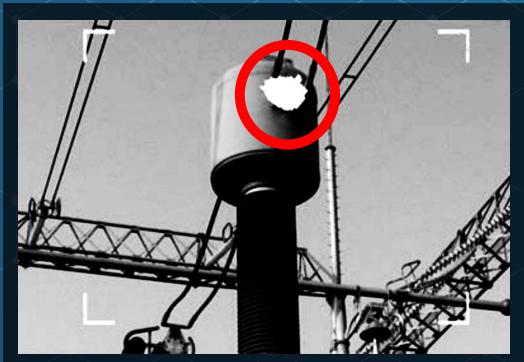
Corona Discharge

- ◆ Loss of \$650,000 per year
- ◆ 7 million pounds of CO₂ wasted per year



Drone Operation

1



2



3







2

MICROGRIDS

Improving Grid Layout

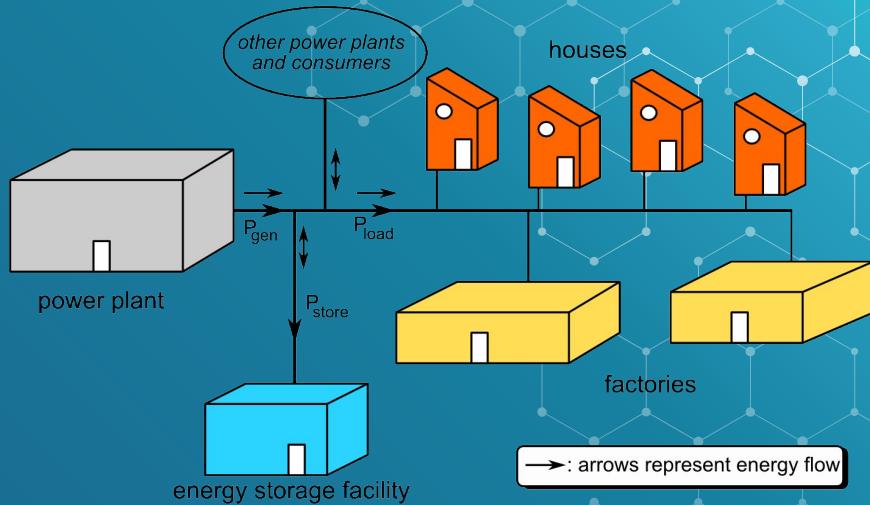
Blackouts & Congestion

- Loss of power resulted in the loss of around 111 lives
- Losses of around \$10 - \$20 billion



Microgrids

- Sustain energy flow
- Access to clean energy
- Integration into main grid
- Self-sustaining
- Familiar maintenance





IMPLEMENTATION

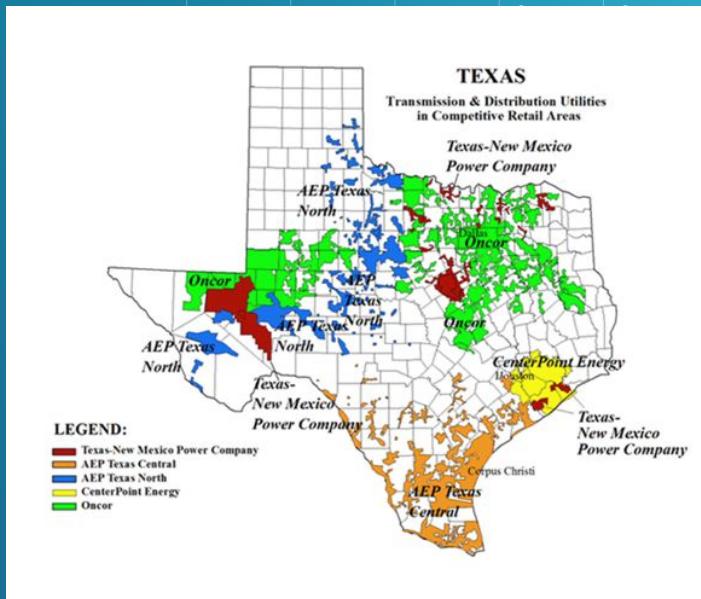
Marketing, Finance, Sales



The Market

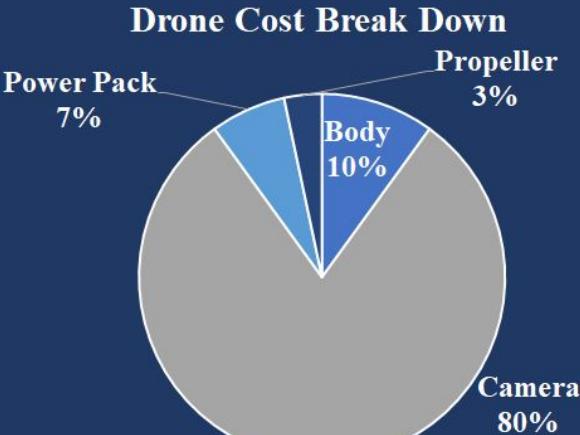
In Texas the major 5 energy companies are

- ◊ Texas-New Mexico Power Company
- ◊ AEP Texas Central
- ◊ AEP Texas North
- ◊ CenterPoint Energy
- ◊ Oncor

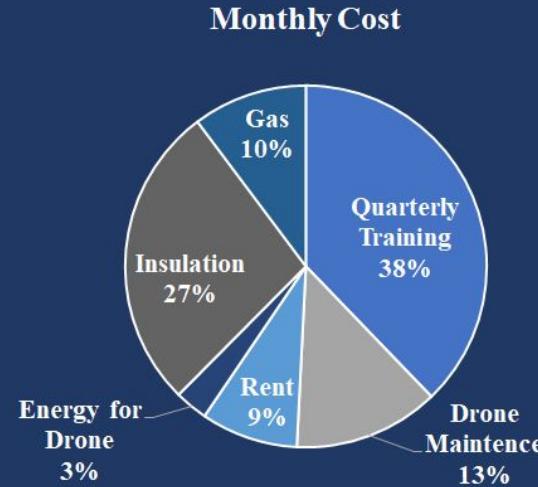




Drone Sales



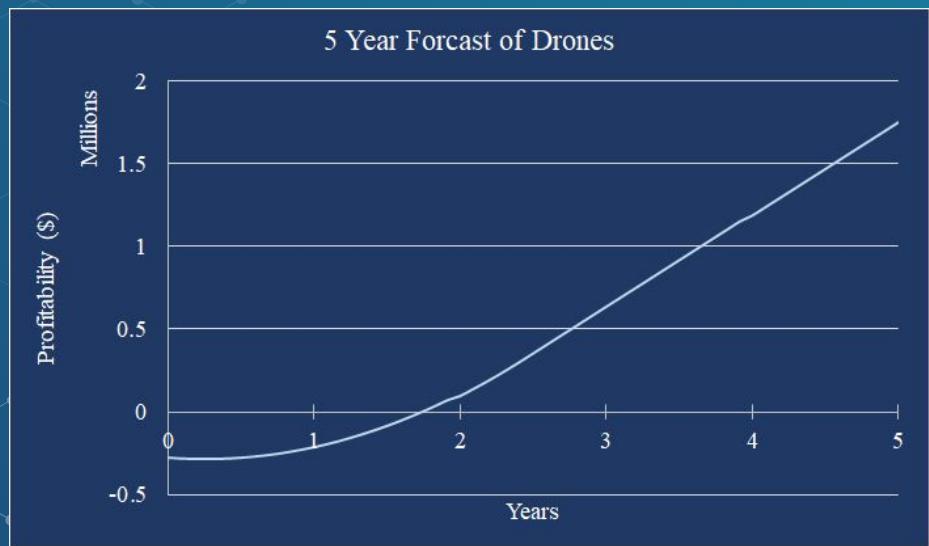
Initial Investment: \$275,000
Drone Pricing: \$7,500
Total Drones: 35



Monthly Cost: \$6,400 - \$6,900
FAA Licenses: \$175 (2 year Licenses)



Drone Finance





Microgrid Finances

- ◊ Peak energy demand
 - ◆ 2021: 77,244 MW
 - ◆ 2030: 85,820 MW
- ◊ Number of microgrids
 - ◆ 2021: 1545
 - ◆ 2030: ~1717
- ◊ Cost range estimate: \$3-6 billion
- ◊ Savings: Winter storm loss was ~\$80-180 billion

Table 1. IQR and Mean Normalized Microgrid Costs in \$/MW per Market Segment

Segment	IQR	Mean
Campus/Institutional	\$4,936,109–\$2,472,849	\$3,338,666
Commercial/Industrial	\$5,353,825–\$3,399,162	\$4,079,428
Community	\$3,334,788–\$1,430,805	\$2,119,908
Utility	\$3,219,804–\$2,323,800	\$2,548,080



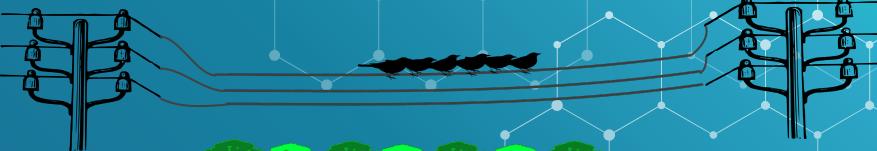
FURTHER CONSIDERATIONS

Ethics and the Future



Ethical Considerations for Drones

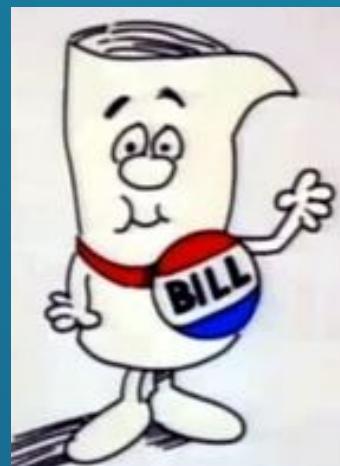
- ◊ Adherence to regulations
- ◊ Environmental safety
- ◊ Operator employment and safety





Ethical Considerations for Microgrids

- ◊ Legislation
- ◊ Feasibility Assessments





THE FUTURE IS NEAR

1

Specialized
Insulation



2

Drones Adaptability



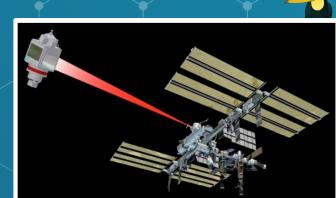
3

Drones Integrated
within Microgrids



4

Laser Beaming
Integration





Final Thoughts



THANK YOU

Audience and Panel

Professor Shayla Rivera

Sara Herrera

Professors Boehm, Ball, Donnell, and Johnson

Kiersten and the Student Engineering Council (SEC)



Questions?

