



# Getting to 100% Renewable Electricity

COLORADO STATE UNIVERSITY &  
UNIVERSITY OF DENVER

ROCKY MTN APPA - SEPTEMBER 2018

# Who We Are

- ▶ Colorado State University
  - ▶ 33,000+ Students
  - ▶ 7,500 Faculty & Staff
  - ▶ 8 Colleges
  - ▶ Research spending \$375 M
  - ▶ Buildings = 12.3 M GSF
  - ▶ Annual utility costs = \$21.7 M



Colorado State University

- ▶ University of Denver
  - ▶ 11,000+ Students
  - ▶ 2,900 Faculty & Staff
  - ▶ 10 Colleges
  - ▶ Research spending \$27 M
  - ▶ Buildings = 5 M GSF
  - ▶ Annual utility costs = \$4.9 M



UNIVERSITY *of*  
DENVER



# Commitments

- ▶ Colorado State University
  - ▶ 2008 – ACUPCC
    - ▶ Carbon neutral by 2050
  - ▶ 2010 – Climate Action Plan
    - ▶ Outlines 16 broad strategies to achieve this goal
  - ▶ 2017 – Climate Reality Pledge
    - ▶ 100% Renewable electricity by 2030

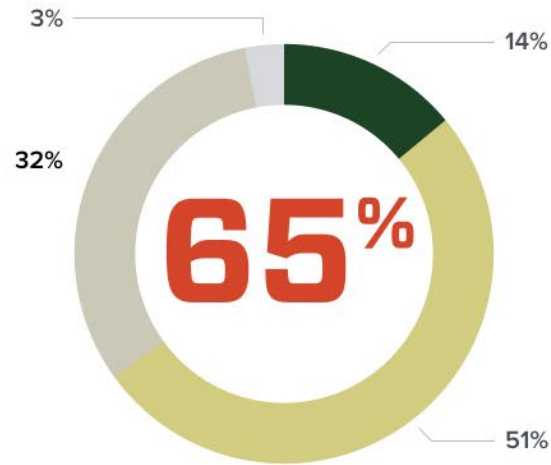


Colorado State University

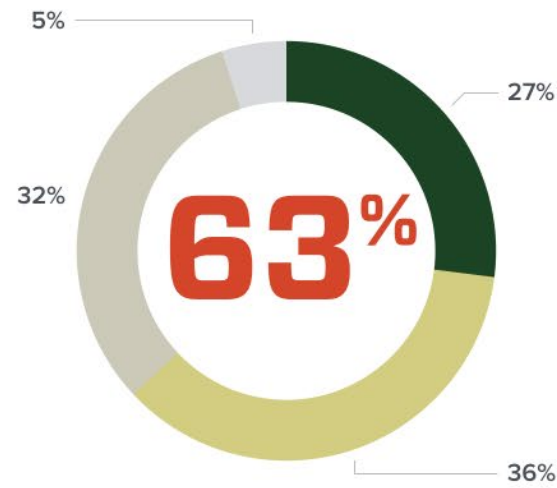
- ▶ University of Denver
  - ▶ 2008 – ACUPCC
    - ▶ Carbon neutral by 2050
  - ▶ 2009 Sustainability Plan
    - ▶ Updated in 2014, 2018
  - ▶ 2017 – 25 goals by 2025



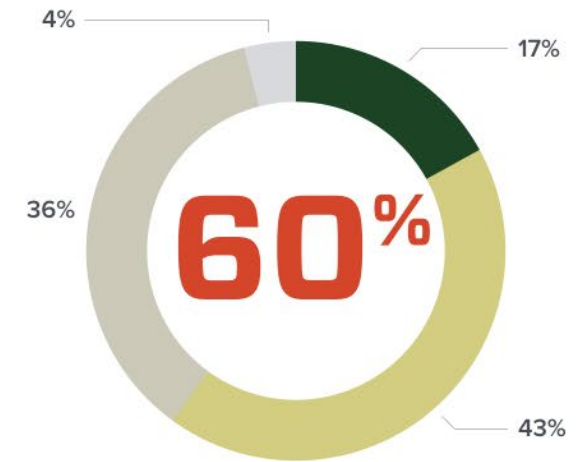
UNIVERSITY *of*  
DENVER



A reputation for academic quality



Is located in a city known for its excellent quality of life

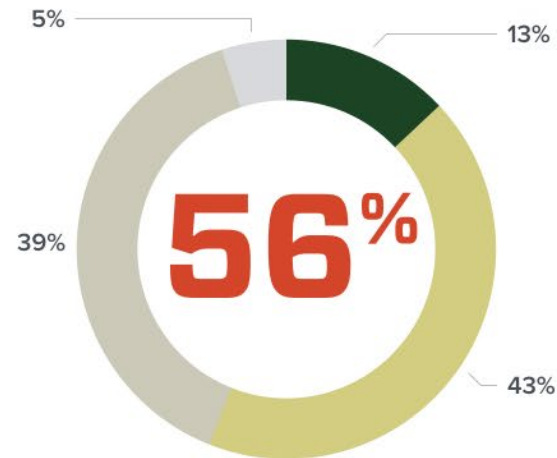


A friendly supportive campus

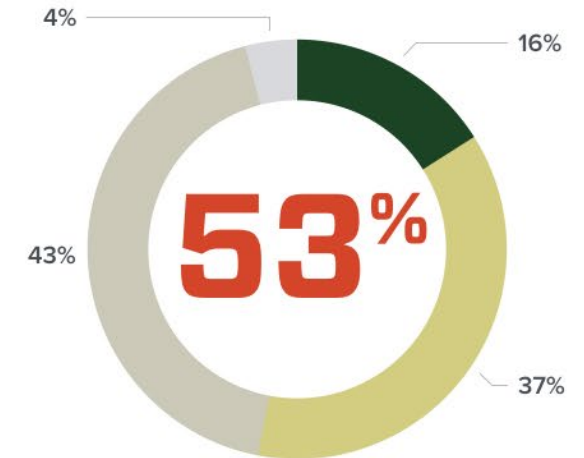
Based upon what you know first-hand or have heard about CSU, please rate its performance.

- Far Above Average
- Somewhat Above Average
- Average
- Somewhat Below Average
- Combined Top 2 Box Response %: "Far Above Average" & "Somewhat Above Average"

Source: Qualtrics Primary Research; Q13



Well prepared graduates



A campus that values environmental sustainability



# Pivotal Leadership, DU

- ▶ Faculty Champions
- ▶ Board of Trustees
- ▶ Sustainability Council
- ▶ Facilities



**Divestment Task Force - Board of Trustees**



# The Power of Students



- ▶ CSU – 4,000+ students signed petition in support of 100% RE
- ▶ DU
  - ▶ 2006 – students implemented a Green Fee for carbon offsets
  - ▶ 2016 – Divest movement led to an 8 month study, Board of Trustees action, Green Fund

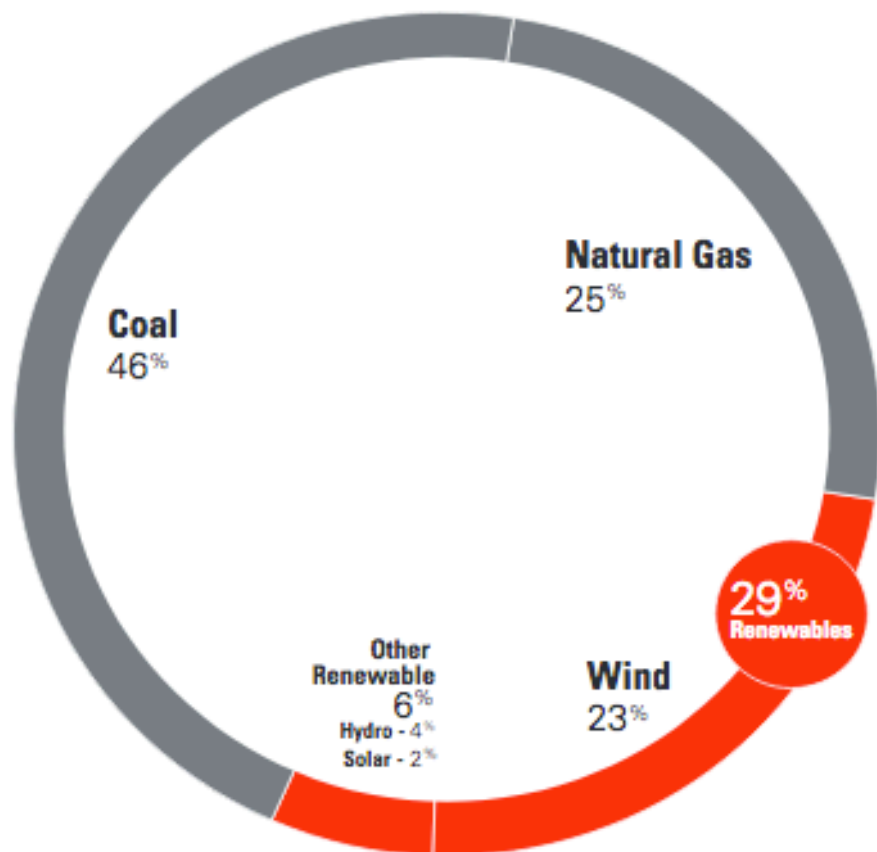


# Critical Partners

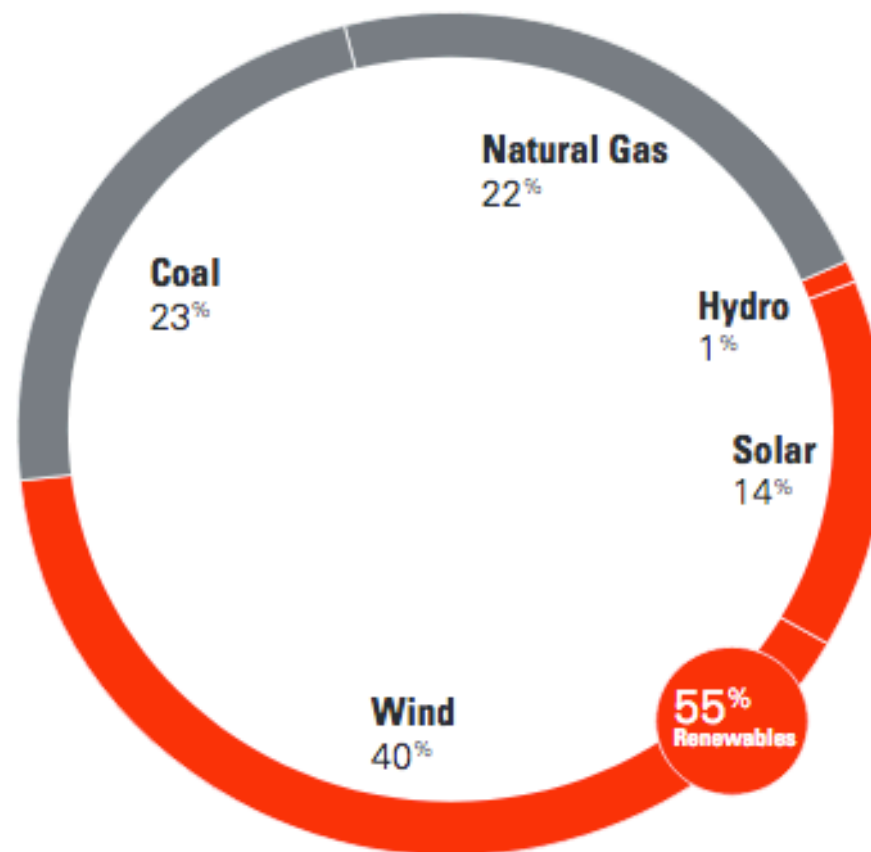
- ▶ Facilities
- ▶ Legal
- ▶ Procurement
- ▶ Vendors
- ▶ Local utilities
- ▶ Political leadership
- ▶ Other large customers

# Xcel Colorado Energy Plan

2016 Colorado Energy Mix



2026 Estimated Energy Mix Under The Colorado Energy Plan

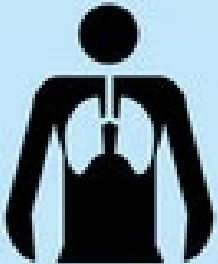




# City and County of Denver 2020 Sustainability Goals

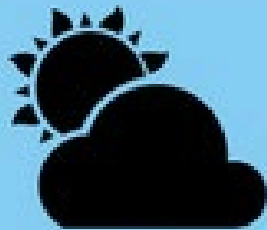
## Community Goals

### Air Quality



Attain all National Ambient  
Air Quality Standards

### Climate



Reduce Denver CO2  
emissions to below 1990  
levels.

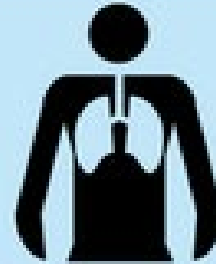
### Energy



Hold total energy use below  
2012 levels, while cutting  
fossil fuels by 50%

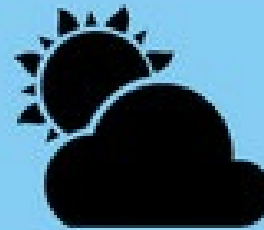
## Government Operations Goals

### Air Quality



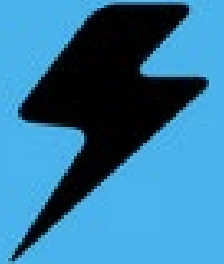
Reduce emissions of  
federal criteria pollutants  
by 1.5% per year

### Climate



Reduce City greenhouse gas  
emissions to <354,000  
mtCO2e

### Energy



20% energy consumption  
reduction, 2x renewable  
energy production

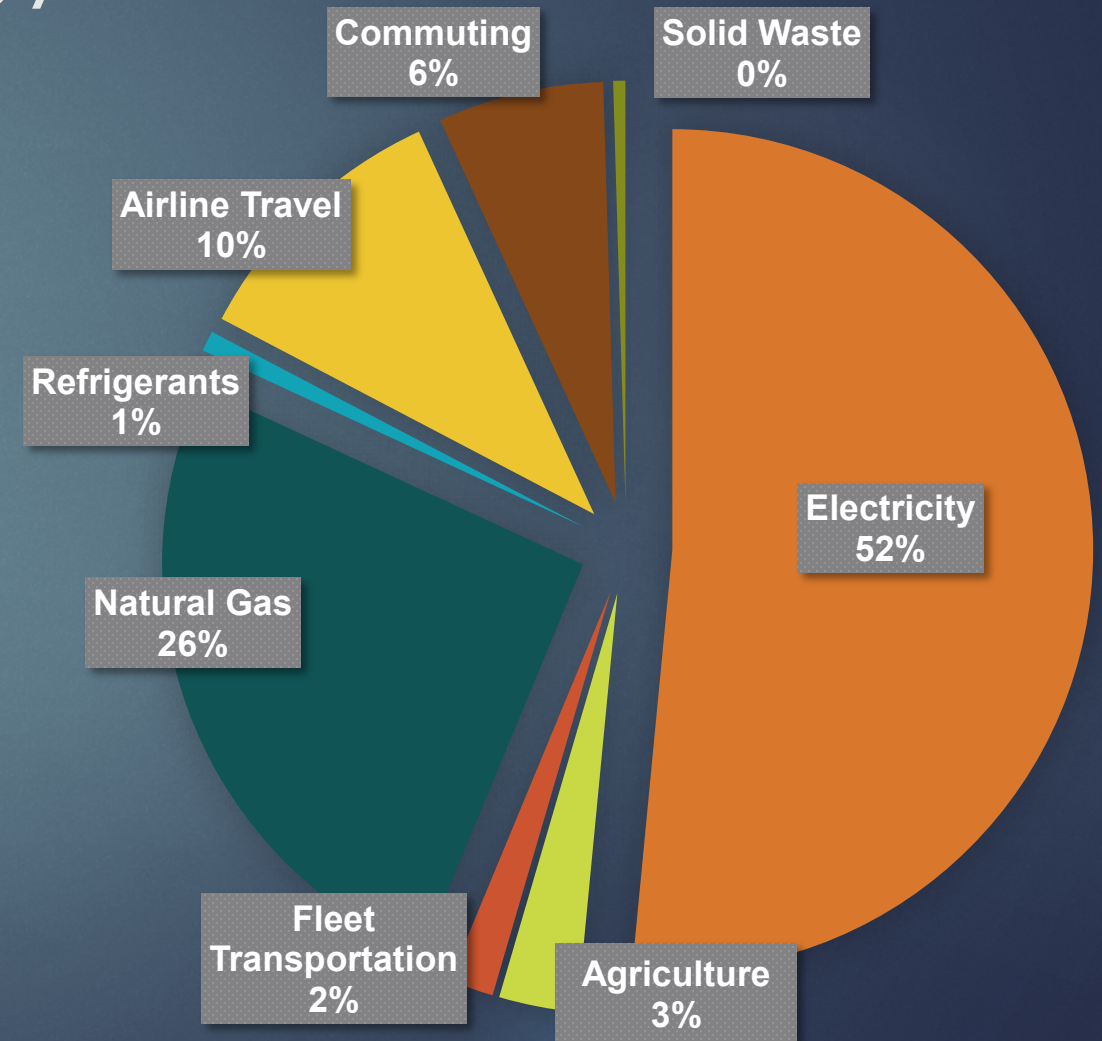
# City and County of Denver

## 80X50 Interim Goals

Year	Reduction in GHG Emissions (2005 Baseline)	Buildings	Electricity Supply
2020	15% reduction	<ul style="list-style-type: none"><li>Commercial buildings 10% reduction in energy use</li></ul>	-
2025	30% reduction	<ul style="list-style-type: none"><li>Residential single-family homes 10% reduction in energy use</li></ul>	<ul style="list-style-type: none"><li>Municipal buildings 100% renewable electricity</li></ul>
2030	45% reduction	<ul style="list-style-type: none"><li>Commercial buildings 30% reduction in energy use</li></ul>	<ul style="list-style-type: none"><li>Community 100% renewable electricity</li></ul>



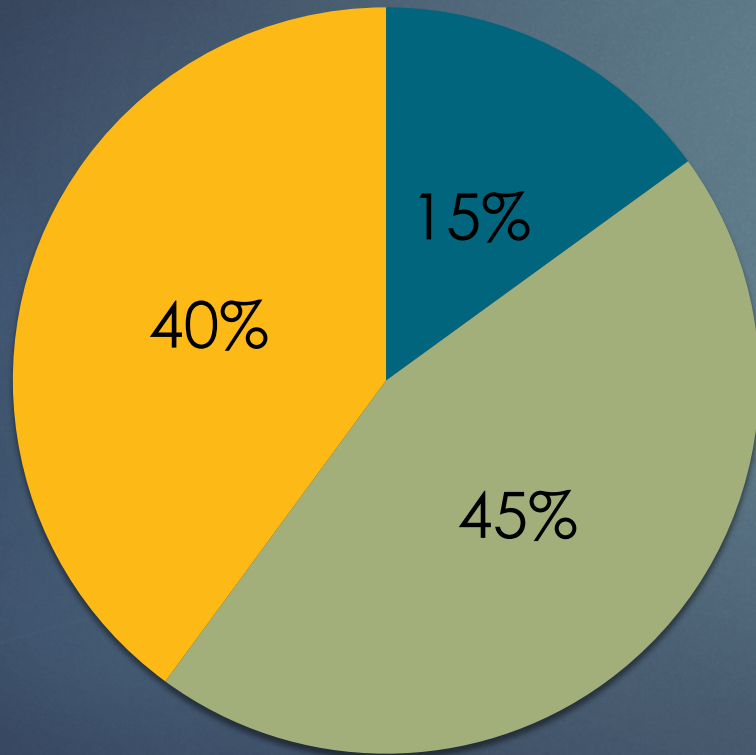
# Energy Efficiency vs. Renewable Energy



# DU's Carbon Footprint

## FY17 Carbon Footprint by Scope

■ Scope 1 ■ Scope 2 ■ Scope 3



Gross Emissions:  
Total 66,968 MTCDE

**Scope 1:** Emissions generated on site  
(fuel combustion and vehicle fleet)

**Scope 2:** Emissions from purchased  
electricity (Xcel)

**Scope 3:** Emissions created offsite,  
related to campus activities (travel,  
waste disposal, etc)



# Energy Efficiency

## Energy Saving Projects - Cumulative Q2 FY18

### FY17 and Prior - Completed

Type	#	Construction Cost	Less Rebates	Net Investment	Annual Savings (@Prior Rates)			Average Payback (yrs)
					Therms	Kwh	Amount	
Controls	15	\$ 406,687	\$(126,882)	\$ 279,805	30,650	2,020,433	\$ 204,615	1.37
Lighting	30	\$ 784,474	\$(275,480)	\$ 508,994		3,118,252	\$ 278,559	1.83
Mechanical	24	\$1,168,857	\$(365,246)	\$ 803,611	88,318	2,337,517	\$ 252,086	3.19
Survey	12	\$ 280,556	\$(158,013)	\$ 122,543				
Totals	81	\$2,640,574	\$(925,622)	\$1,714,952	118,968	7,476,202	\$ 735,260	2.33

### FY18 - Completed or In Progress

Type	#	Construction Cost	Less Rebates	Net Investment	Annual Savings (FY17 Rates)			Average Payback (yrs)
					Therms	Kwh	Amount	
Controls	0							
Lighting	1	\$ 387,925	\$ (19,516)	\$ 368,409		1,548,330	\$ 139,349	2.64
Mechanical	0							
Survey	0							
Totals	1	\$ 387,925	\$ (19,516)	\$ 368,409		1,548,330	\$ 139,349	2.64
Cumulative	82	\$ 3,028,499	\$(945,138)	\$2,083,361	118,968	9,024,532	\$ 874,609	2.38

# CSU – RFP Process

- Nov. 2016 - Issue Wind RFI
  - Jan. 2017 responses due
- Aug. 2017 - Issue RE RFP
  - Oct. 2017 responses due
- March 2018 – RFP Closed with an on-site solar award for DU & no award for CSU



# DU Award/Implementation Process

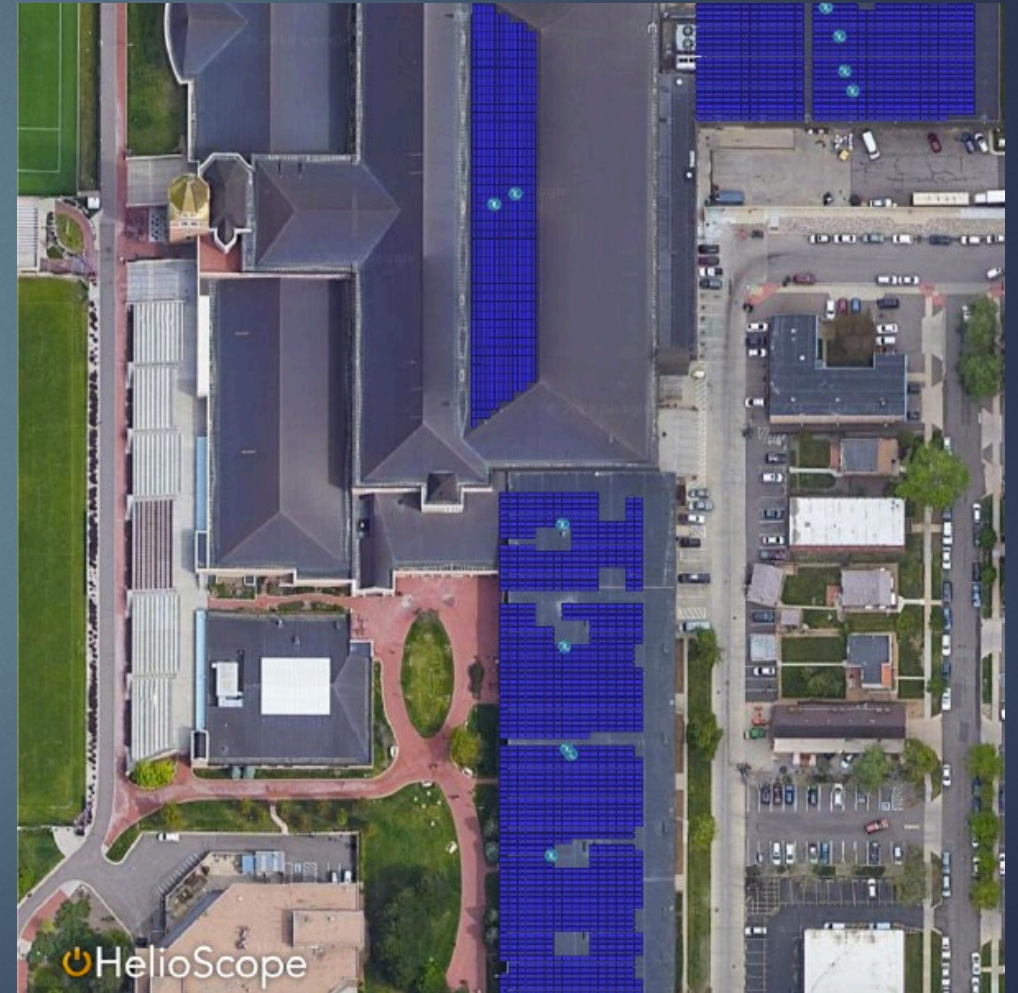
- March 2018 – Presented to the Board of Trustees requesting award, BOT requested subcommittee to review
- April 2018 – met with subcommittee
- May 2018 - received approval to proceed to contract negotiations and due diligence
- June/July 2018 – roof analysis, site visits
- August 2018 – present – contract negotiations
- Goal: Begin install in October, complete by June 2019



# Where are we now?

## DU finalizing planning and contract

- ▶ Pivot Energy (formerly Microgrid)
- ▶ 18 Buildings
- ▶ Flat roof, ballasted systems
- ▶ 2+ MW







# Last but not Least – Patience







“ It is not our ideas that make us  
optimists or pessimists, but it is our  
optimism or pessimism that makes  
our ideas ”

MIGUEL DE UNAMUNO





# Contact Information

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