2020 CARBON NEUTRALITY

Draft Climate Action Plan

Dickinson's Carbon Commitment Timeline

2007

We sign on!

2008

Our Footprint is uncovered!

2009

Our First CAP

2012

CATF Formed to update CAP

Energy Studies Completed

2013

CAP II Developed with costs and returns

2020

Target!

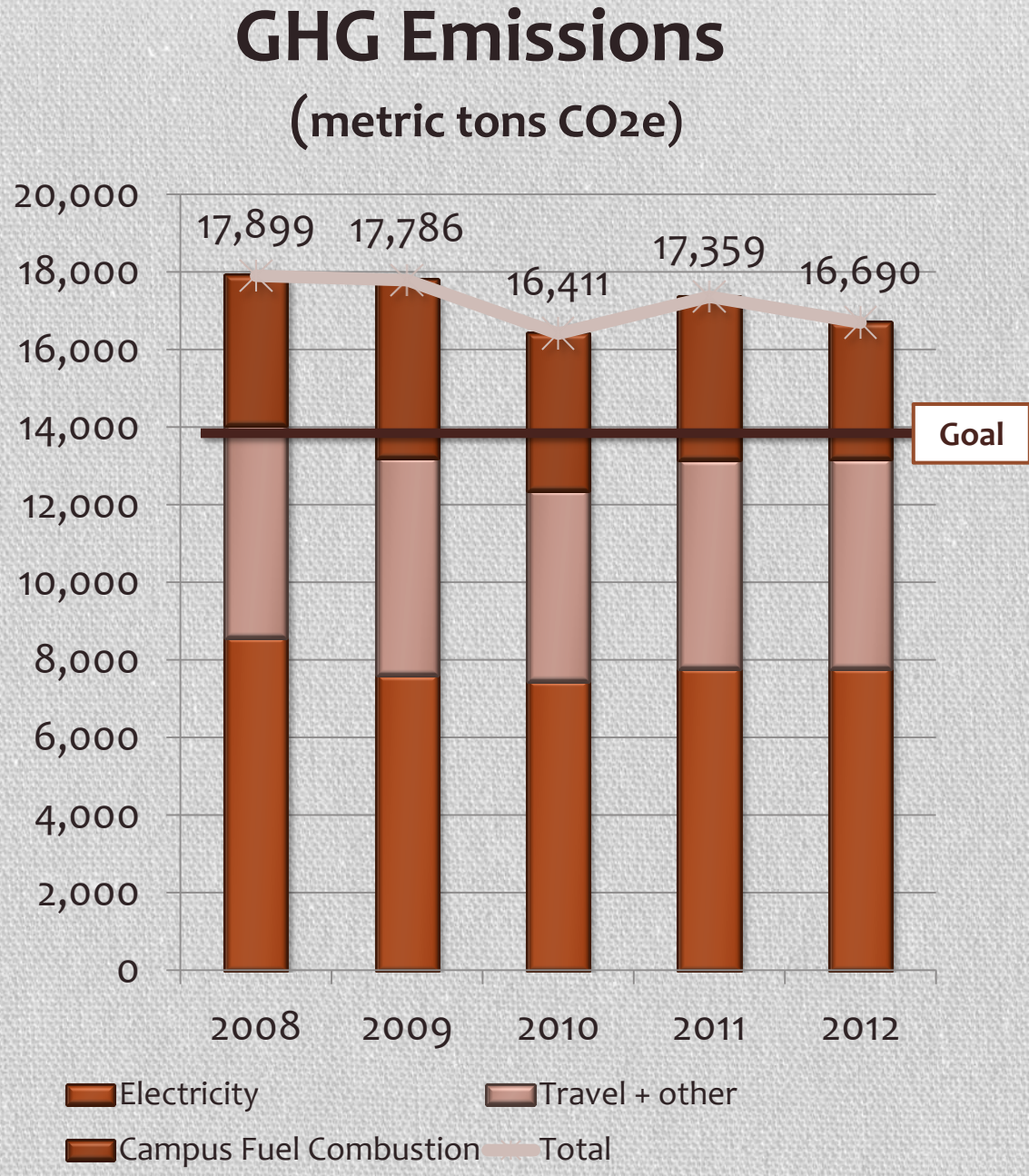
Goal

Reduce emissions by 25% based on 2008 levels.

2008 Level:
17,899 Metric Tons of CO_2

25% Reduction*:
4,475 Metric Tons of CO_2

*assuming new square footage will reset us to 2008 levels



Strategies

How do we reduce Greenhouse Gas Emissions?

Climate Action Taskforce (CATF)

History

- **Established by President's Commission on Environmental Sustainability (PCES) to:**
  - Review progress on climate neutrality
  - Develop recommendations
- **Four teams composed of students, staff and faculty**
  - See teams at right
- **Worked from January 2013 through April 2013**
- **Presented findings and recommendations to PCES in April 2013**
  - Recommendations not necessarily endorsed by full CATF or PCES

Teams

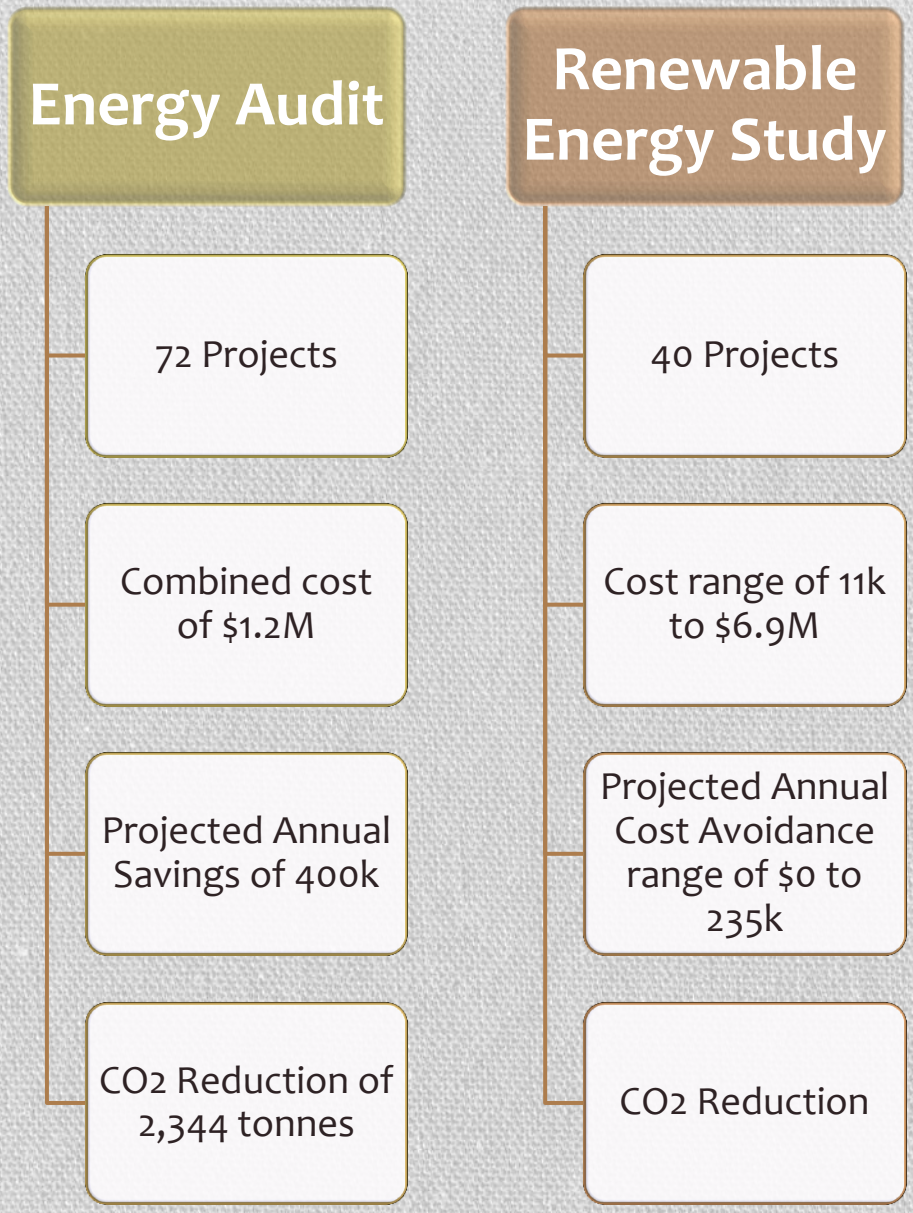
- **Efficiency & Conservation**
  - Jim Hoefler
    - Sarah Ganong (student researcher)
    - Mauro Lifschitz (student researcher)
- **Renewable Energy**
  - Durwin Ellerman
  - Kristen Williams
    - Justin McCarty (student researcher)
    - Francisco Mena (student researcher)
- **Transportation**
  - Marcus Keys
    - Ann Lemmo (student researcher)
    - Connor Shields (student researcher)
- **New Construction & Offsets**
  - Scott Noble
  - Frank Laquitara
    - Qiaoling Yuan (student researcher)
    - Yujia Zhou (student researcher)

CATF Recommendations

- **Energy Efficiency & Conservation**
  - Review Stone House report for high impact projects with favorable ROI
  - Give special consideration for GHG reduction spending
  - Assess leased buildings for energy efficiency improvements
  - Examine scheduling options
  - Investigate energy monitoring systems
  - Consider hiring full-time energy manager
- **Transportation**
  - Carbon offset fee of $50 for study abroad and employee air travel
  - Establish online rideshare program with Zimride
  - Parking fees for students and employees
  - Hire Alternative Transportation Coordinator
- **Renewables**
  - Give careful consideration and analysis of renewable energy options
  - Explore innovative financing options, tax credits and grant opportunities
  - Involve students in the analysis, design and installation of renewable energy systems

FY 13 Facilities Management Investment – 75k

- Energy Audit of 4 Buildings
  - HUB
  - Library
  - Rector
  - Adams Hall
- Renewable Energy Study
  - Solar
  - Wind
  - Bio Mass
  - Co-generation



Project Examples

Building	Project	Projected Cost	Projected Annual Savings	Carbon Reduction	Notes
Rector	Provide occupancy sensors at the labs to reduce airflow and temperature when the spaces are not in use.	$60,000	$70,410	417	Also applicable to labs in Tome and Kaufman
Adams +	Retrofit corridor and room lighting from T12 to T8	$18,000	$8,500	50	Applicable to multiple building across campus
HUB	Install VFDs for control of the chilled water pumps.	$9,500	$3,052	18	Applicable to other buildings
Library +	Convert chilled water pumps to variable flow	$18,000	$6,100	36	Applicable to multiple buildings across campus
Central Energy Plant	Install a 250 kW gas-fired AirCoGen combined heat and power unit.	$532,400	$77,000	609	

Action Plan

1. **Implement all Energy Audit projects in 4 Buildings, including:**
   - Lighting retrofits, controls, efficient equipment, retro-commisioning

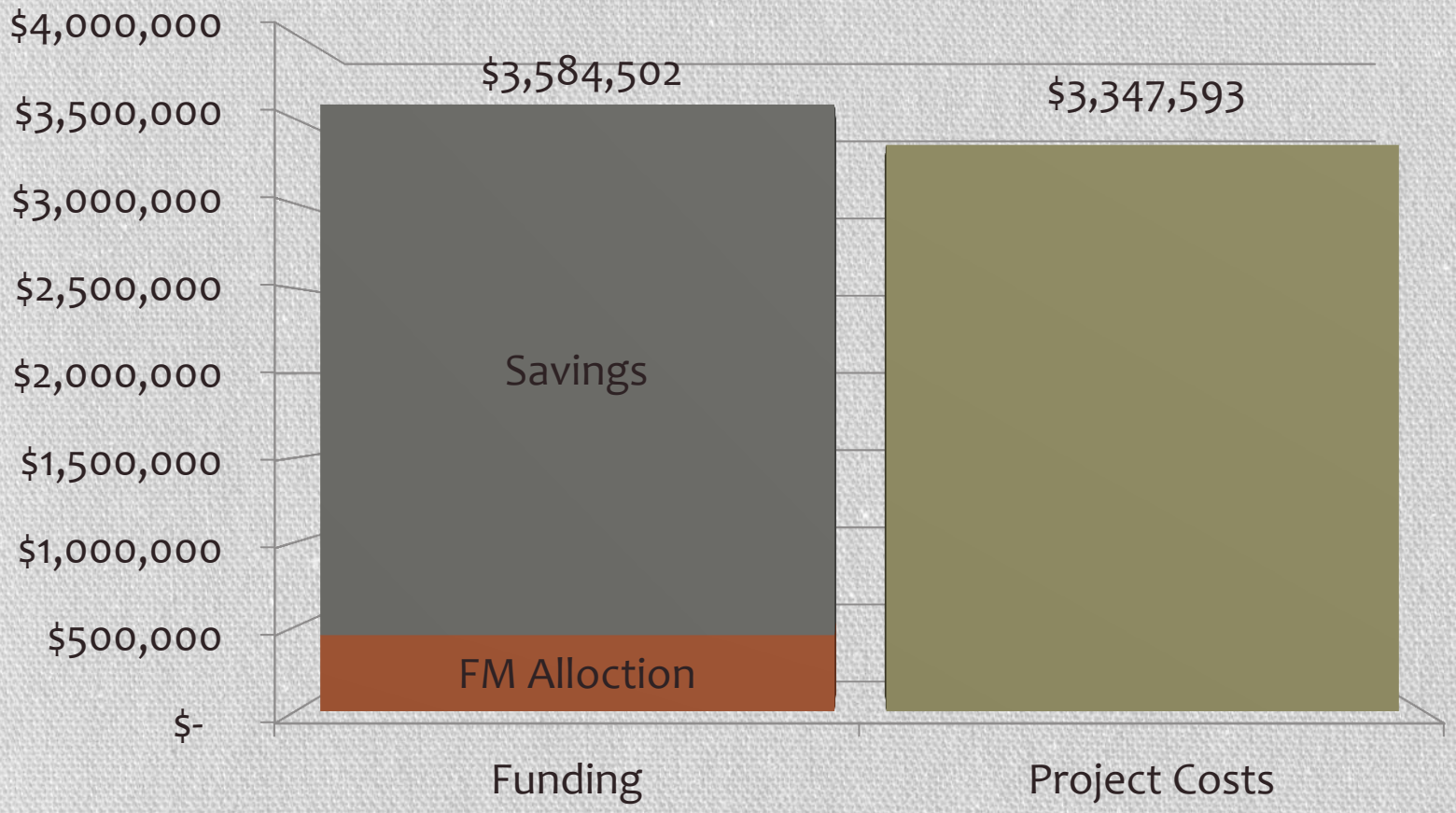
2. ***Implement High Priority projects from expanded Energy Audit:***
   - *Conservative assumption made regarding current expanded study, to be complete by end of semester.*

3. **Installation of high efficiency combined heat and power units and renewables beginning in FY18**

4. **Ongoing efforts in conservation including:**
   - education, awareness and behavior change

   i.e. Turning light and appliances OFF/carpooling

Funding vs Need



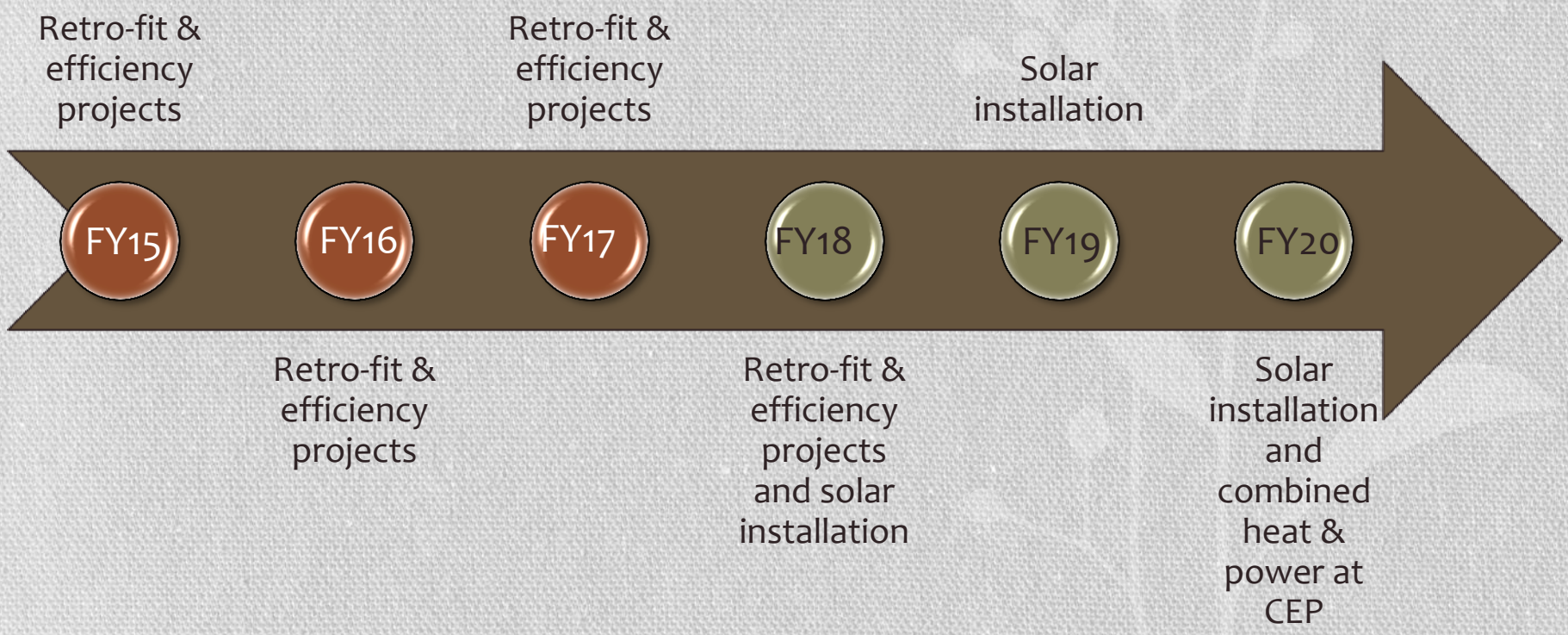
Funding Strategy

1. Continue annual allocation of $75,000 from Facilities Management's Project Funding
2. Complete all projects with net ≤ 1 year payback early in FY15 for net $0 cost
3. Establish ***Green Revolving Loan Fund*** with FM annual allocation and savings realized from completed projects to complete additional projects until goal is met
4. Allow Conservation Projects to serve as program ***contingency***
5. Fund rate increases from source other than savings
6. Annual assessment of returns on projects

Green Revolving Loan Fund

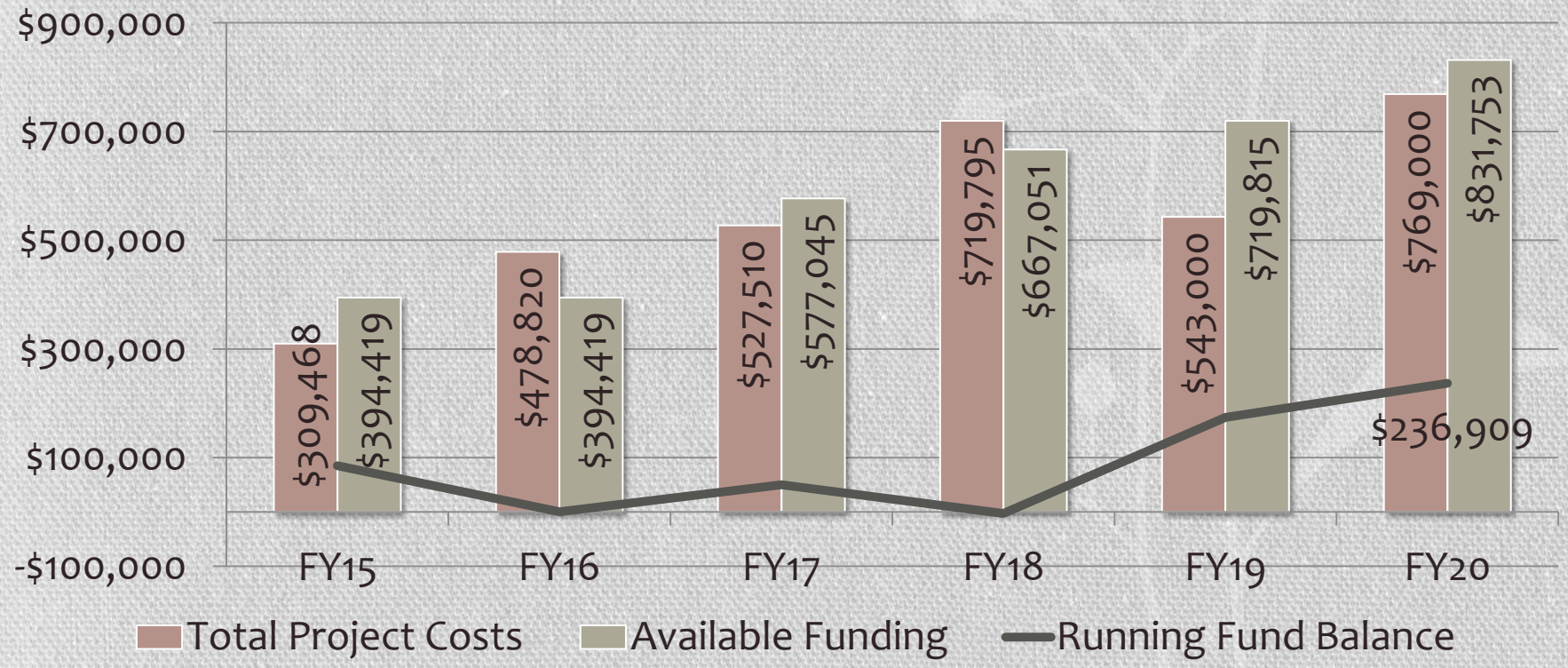
Or…

Project Timeline

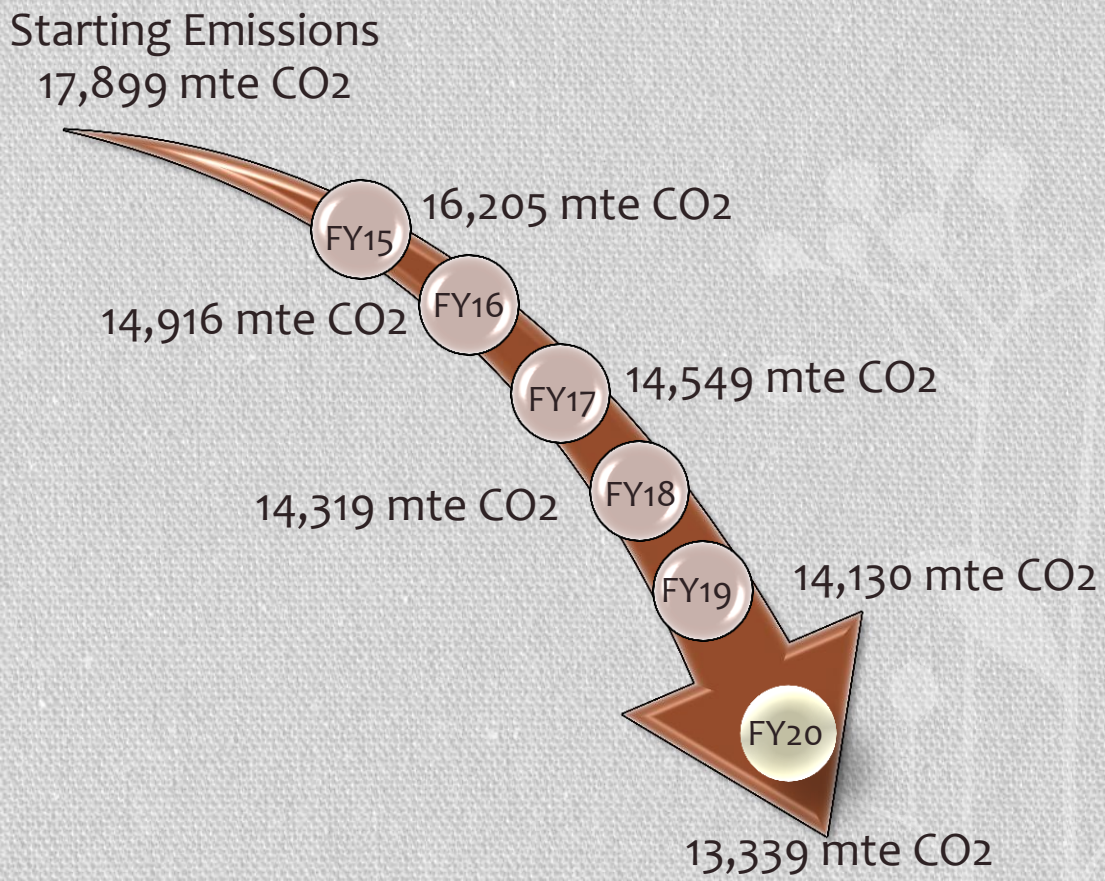


Annual Spend & Savings

- Projects completed as annual funding and savings are available
- Total reduction of 4,560 metric tons of CO2
- All projects completed and paid for with net savings by 2020



Emissions



GOAL: 13,424

PCES Recommendations

- Initiate in FY2015 a systematic program of annual investments in energy efficiency and renewable energy projects estimated to yield favorable financial returns and sufficient GHG emission reductions to reach our 2020 goal.

- Establish a green revolving fund that would reserve utility savings to finance the program of annual investments in energy efficiency and renewable energy.

Challenges

- ***Current Capital Construction projects***
  - 76,500 gross square feet
  - 24,800 in science facilities which use significantly more energy than campus average
  - Will not have emissions data on all of the new space until July 2015
  - Assuming new space will take us back to 2008 numbers
- ***New Residence Hall***
  - Will likely be built before 2020
  - Emissions from additional 38,000 square feet
  - Can it be built net zero?
- ***Changing face of Renewable Energy Credit market***
  - Currently affordable but as more entities attempt to reach neutrality, costs could skyrocket.
- ***Assumed risk in projections***
  - Costs, savings and carbon reductions provided by outside consultant and vetted internally
  - Higher first costs or less savings will impact timeline

Questions