SGEF Council Presentation

Project Proposal

Magnolia Apartments HVAC System

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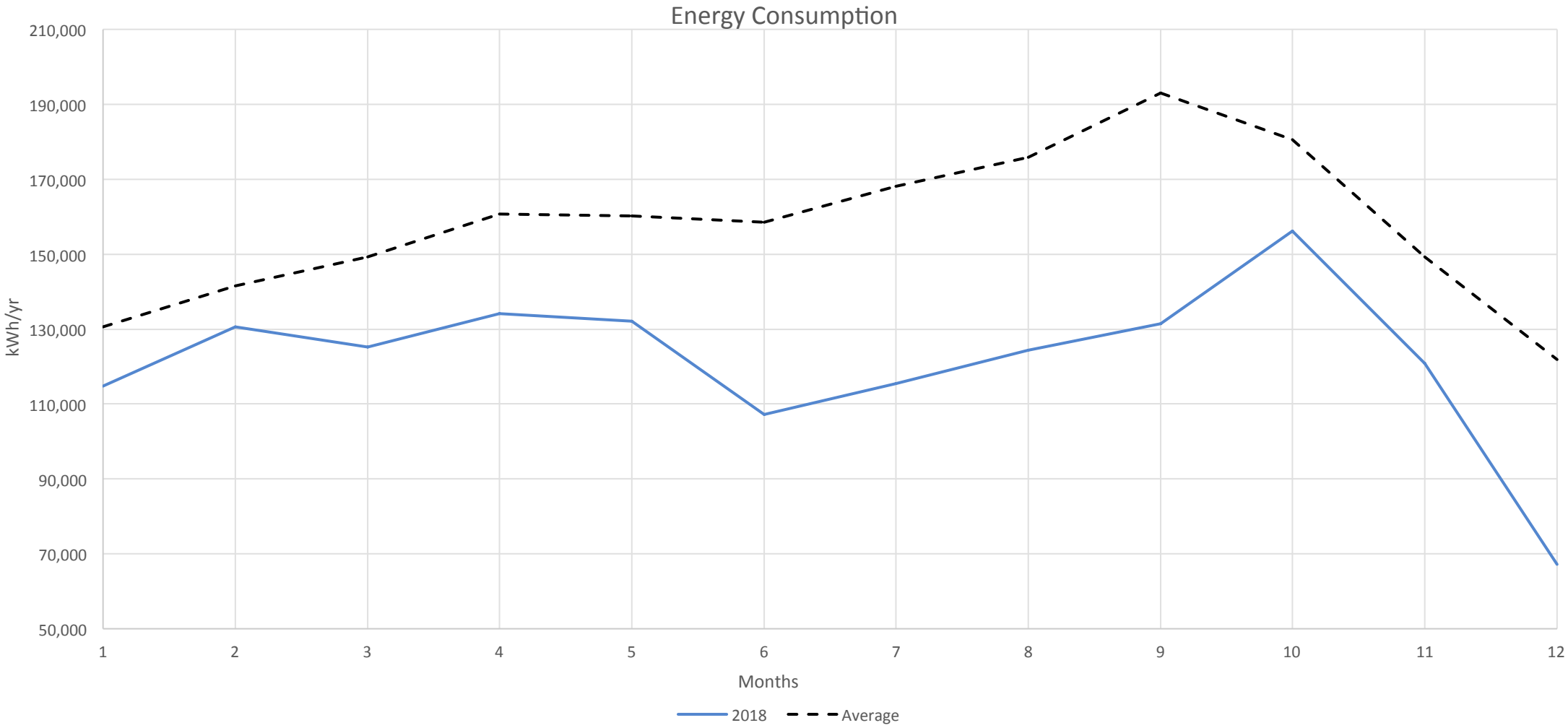
Outline

- Background - improvements to building envelope
  - Photos
  - Energy Usage
- Introduction to project
- HVAC system upgrade
  - Equipment
  - New system JCI and CEA
- Sustainability
- Project Cost
- Final

Magnolia Background

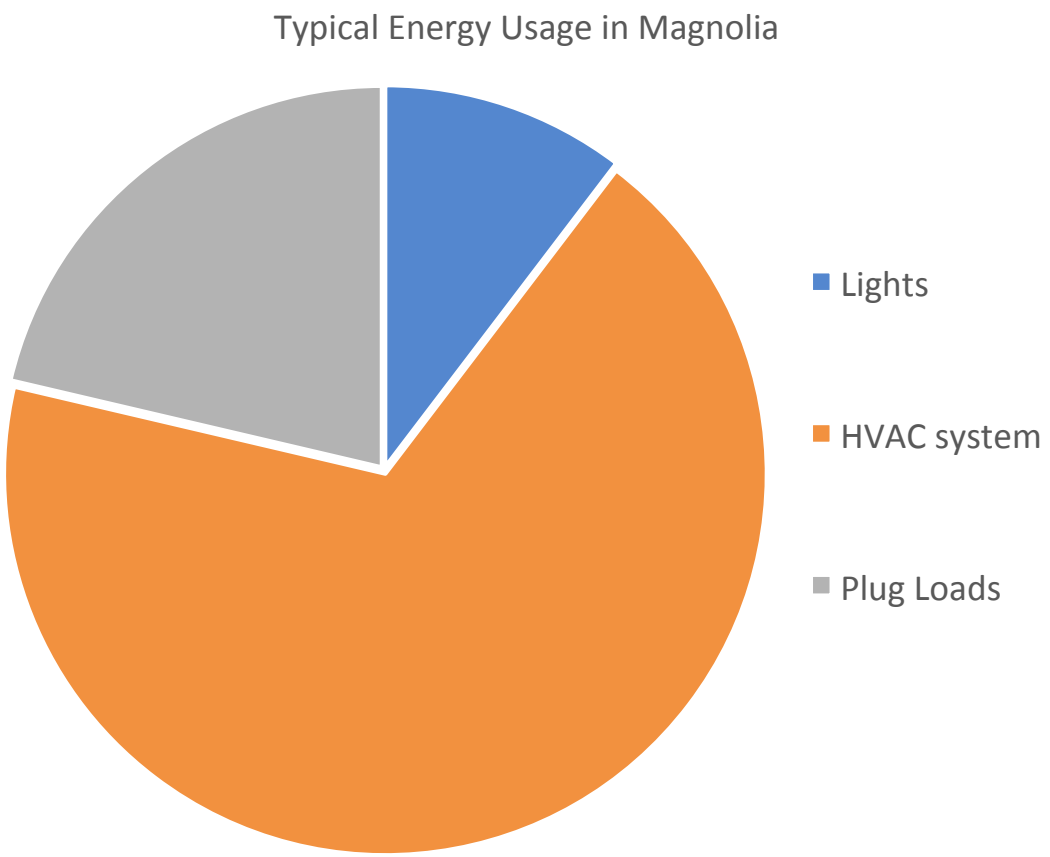
- Built in 2001
- Upgrades in 2017
  - 2’’ layer of insulation added to exterior walls
  - Roof replacement

Result of Improvements



Introduction

- HVAC upgrade – more efficient
- Typically 65% of the energy used by the building is for space cooling and maintenance
- Reduction in energy usage equates to cost and carbon reductions



Equipment

HVAC system upgrade

Controls

Higher Efficiency HVAC system

- HVAC system SEER value – Seasonal Energy Efficiency Ratio
  - SEER 16 – high efficiency
  - SEER 14 – standard efficiency
  - SEER 13 – low efficiency
- More energy efficient SEER 16 over existing lower efficiency SEER 13
- Installed to 7 buildings

Equipment
Comfort Series Heat Pump with Puron 2 Tons Cooling
Crankcase Heater for Outdoor Unit
Start Assist - Capacitor and Relay for Outdoor Unit
FB4C Base Series Fan Coil with Puron
5 kW Electric Heater for Indoor Unit

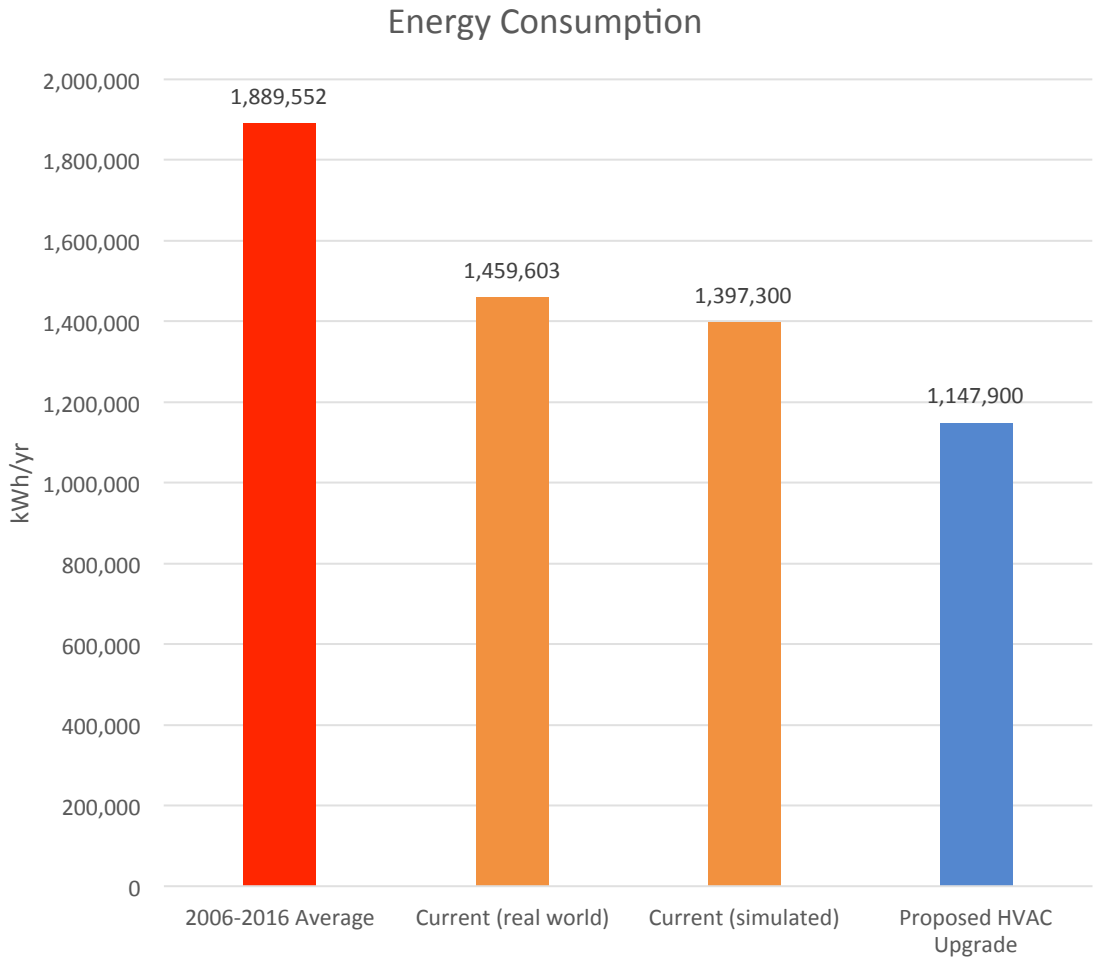
Controls

- Installation of controls to manage room temperatures/setpoints
  - Temperature range constraints
  - Global set-point changes
  - Scheduling for occupancy
- Realtime monitoring of equipment
  - Quick problem assessment
  - Virtually no equipment downtime

Johnson Controls

Energy Savings

- 18% savings vs simulated current
- HVAC upgrade vs simulated current
  - Energy Savings: 249,400 kWh/yr
  - Cost Savings: $22,446 /yr



Sustainability

- Energy Savings: 249,400 kWh/yr
- eCO_2 reduction: 176 MT/yr

- Number of trees: 2,916 seedlings grown for 10 years
- Number of cars off road: 37
- Amount of gasoline saved: 17,325 gallons

Project Cost

Project Cost

Item	Cost
HVAC Equipment	$ 1,659,260.71
Controls	$ 396,507.00
Student Engagement	$ 1,500.00
Project Grand Total	$ 2,057,267.71
Matching Funds	**$ 1,784,414.21**
SGEF Request	**$ 272,853.50**

SGEF Breakdown Request

Item	Cost
Difference between SEER16 and SEER14	$ 73,100.00
Student Engagement	$ 1,500.00
Half of the controls	$ 198,253.50
SGEF Total	**$ 272,853.50**

Conclusion

- Significant energy savings
- Large reduction in Green House Gas emissions
- Improves equipment monitoring and subsequent student life

Thank you!