Energy Use & Solar Feasibility Study Update

Nov. 2026

HILLSBOROUGH
NORTH CAROLINA

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Clean Energy Resolution

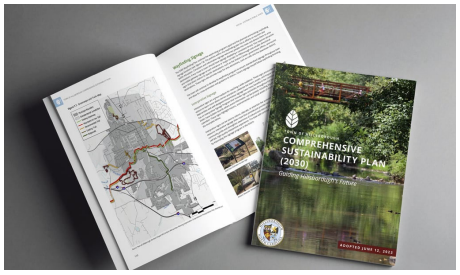
- September 2017: Town Board adopts resolution establishing a transition to 100% clean and renewable energy by 2050, 80% clean and renewable by 2030.
- Resolution endorses:
  - Building a more resilient community.
  - Promoting an environmentally sustainable economy.
  - Protecting the local community and earth for future generations.



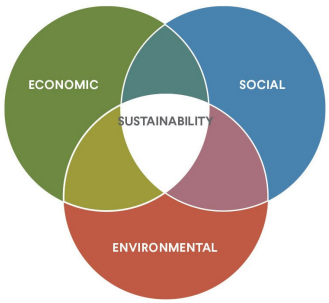
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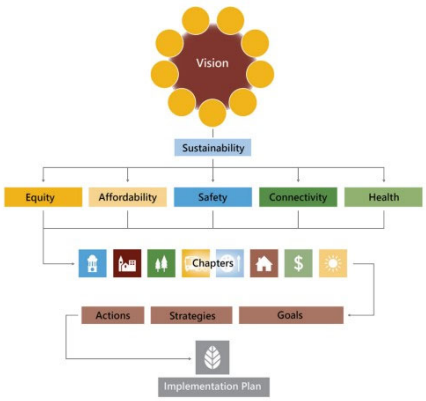
Clean Energy Initiatives

- September 2018: Energy Baseline Report and Energy Dashboard (TJCOG)
- September 2018: Technical and Economic Analysis of Rooftop Solar Photovoltaic (N.C. Clean Energy Technology Center, Green Power NC)
- November 2018: Clean Energy Resolution Project (TJCOG)
- October 2021: Local Government Clean Energy Report (NCSEA)
- June 2023: Town Board adopts the Comprehensive Sustainability Plan
- March 2024: Enpira Energy Management Software
- October 2025: Comprehensive Sustainability Plan Progress Update
- July 2026: Solar Feasibility Study



Comprehensive Sustainability Plan







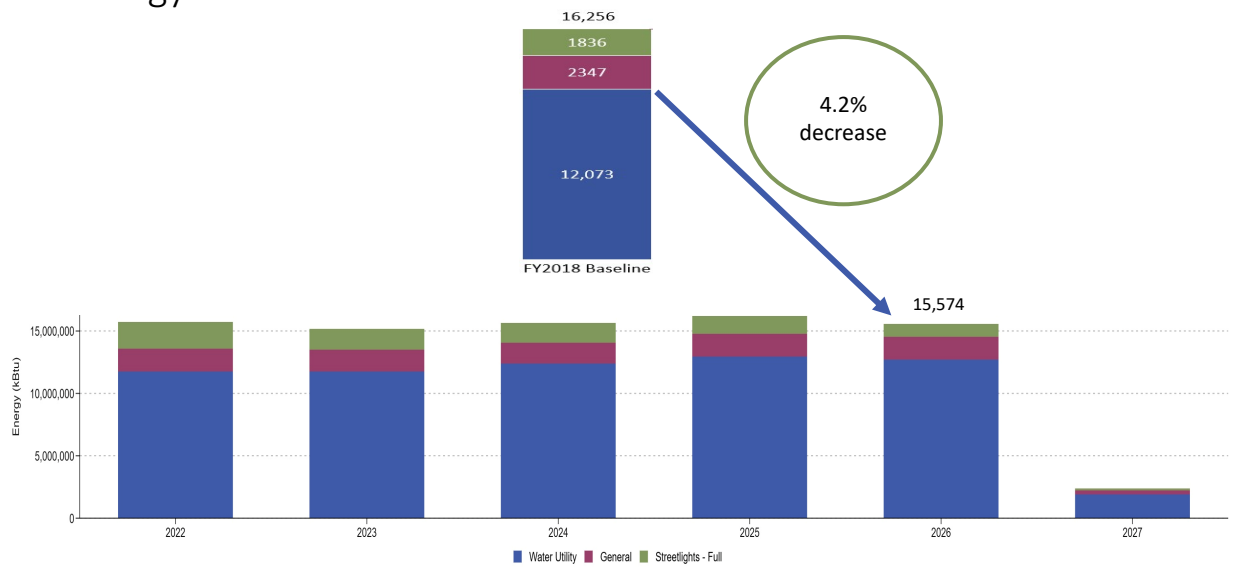
Enpira Energy Management Software

Enpira is an energy and resource information management software service that enables licensees to consolidate and track utility information for buildings and other facilities. Enpira, with the permission of the licensee, collects the facility's electricity, natural gas, and/or water usage information from the respective utilities.

- 2024: Town contracted Enpira Inc. to build energy management database and portal
- Database tracks electricity, natural gas, water, and fuel use for town operations/facilities
- Baseline data from Clean Energy report is 2018
- First reliable data year in model is 2022
- Highly versatile software that can analyze trends and report on use and expose waste
- Occupied facilities have spikes in electricity and gas use in summer and winter (HVAC)



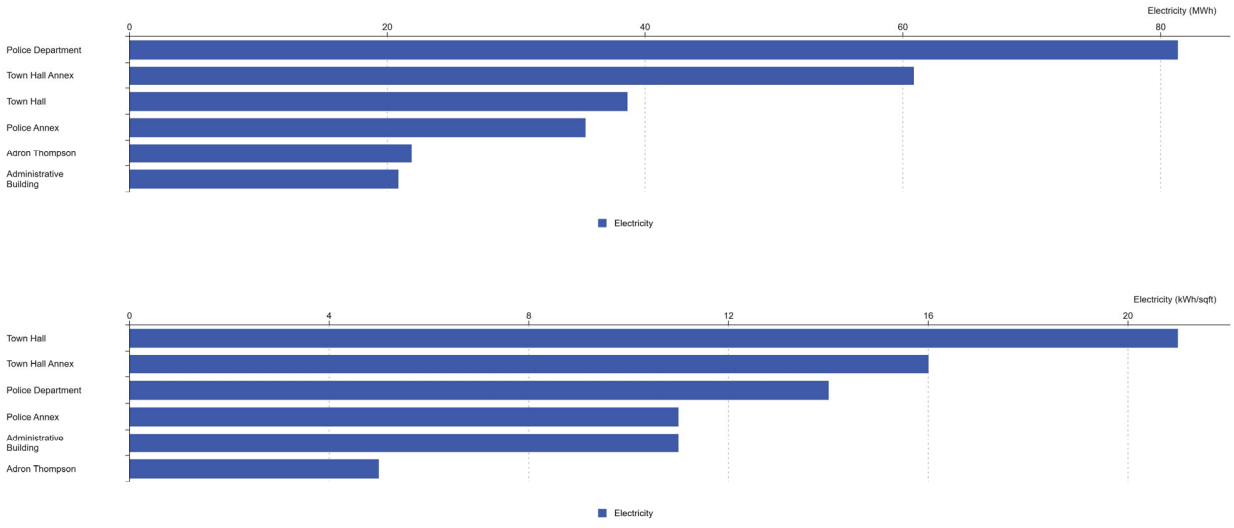
Total Energy



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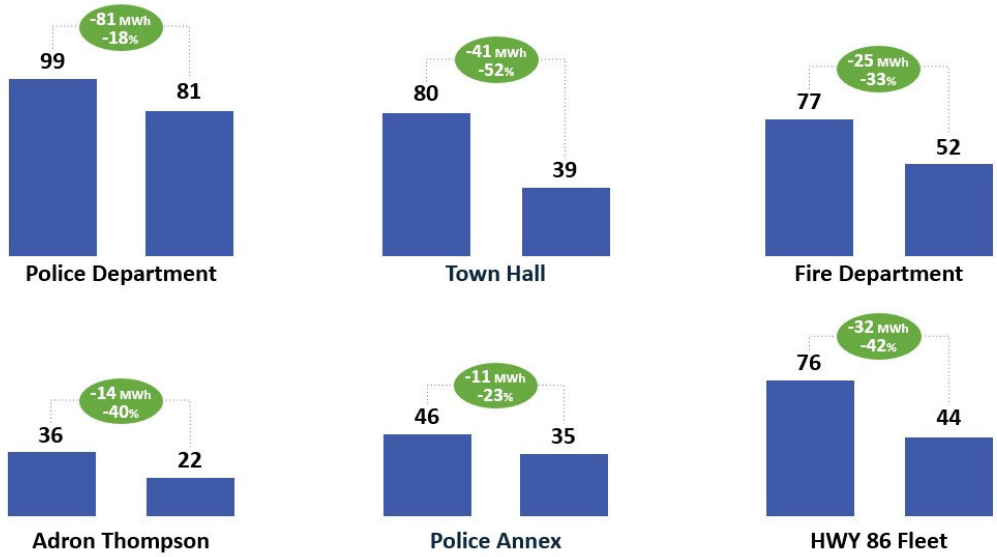
Usage vs. Cost Per Square Foot (FY26)



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Facility Electricity Reduction (FY18 baseline vs FY26)



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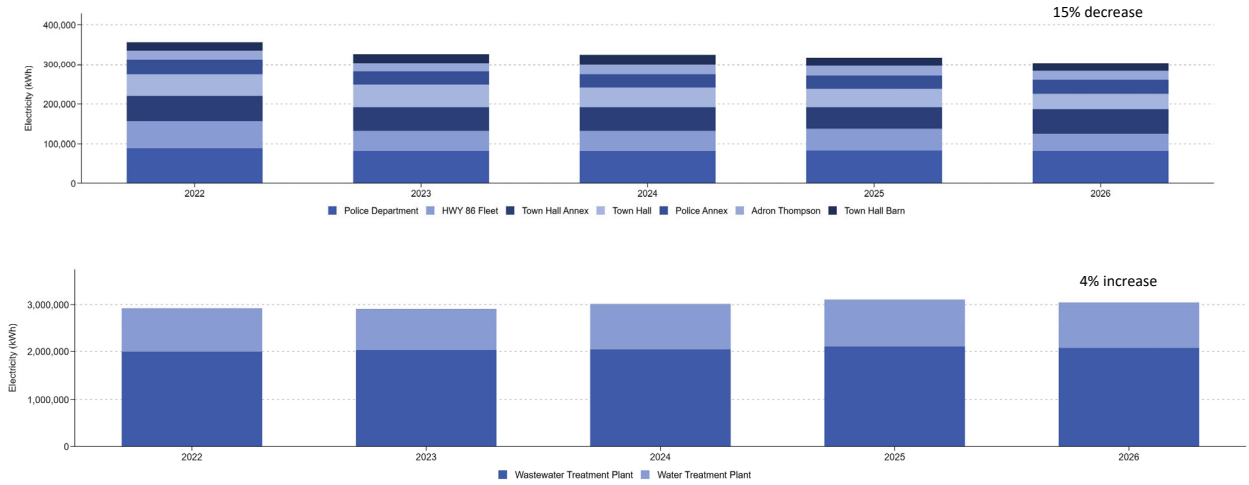
Facility Electricity Avoided Cost (FY18 baseline vs FY26)



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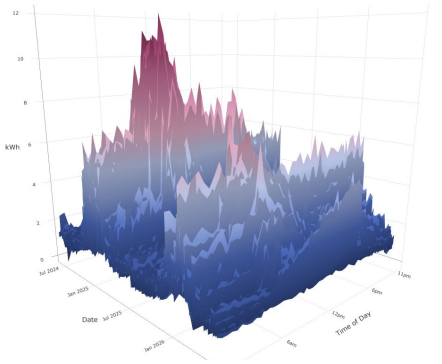
Electricity at Occupied Facilities

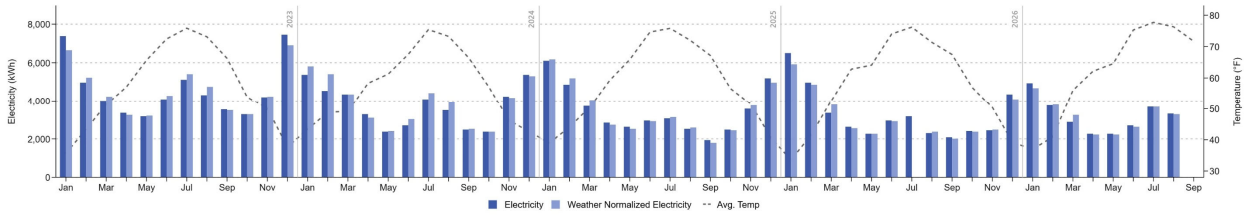


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Town Hall

- Higher overall cost per square foot, less energy efficient (c. 1821)
- Peaks in winter and summer months (HVAC and weather)
- Electricity per month from January 2022- July 2026 (30% decrease)

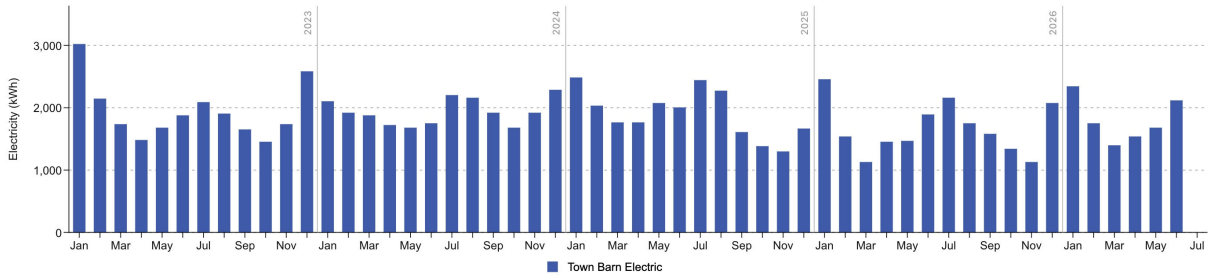




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Admin. Building

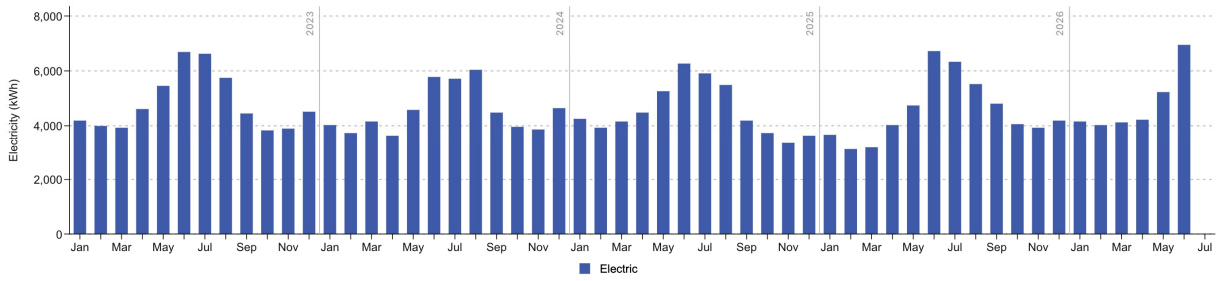
- Electricity per month from January 2022- July 2026
- Admin. Building uses 51% percent less electricity than Town Hall



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Town Annex

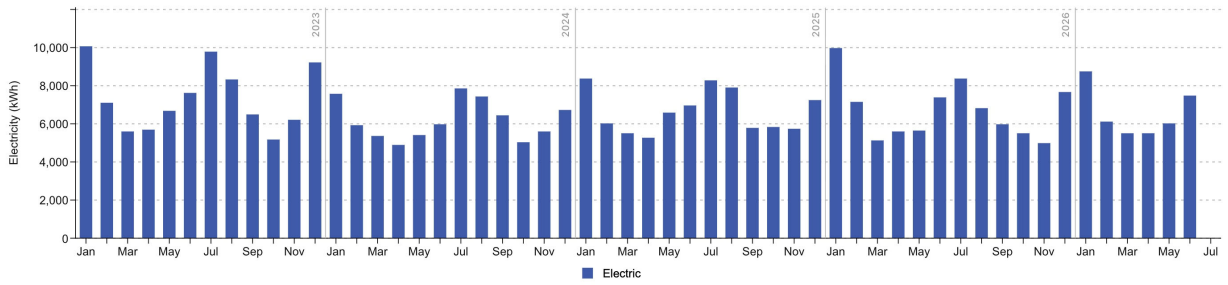
- Annex uses 59% more electricity than Admin. Building (Size and Hours of Operation)



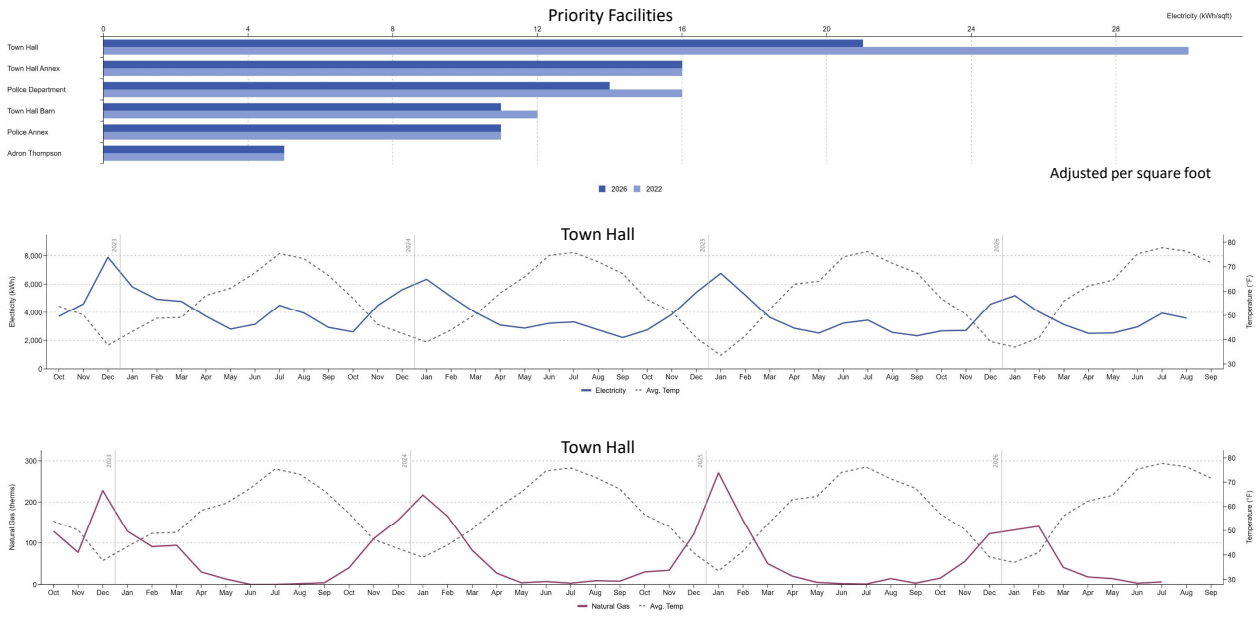
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Police Department

- HPD has higher electricity output (# employees, building size, and hours of operation)



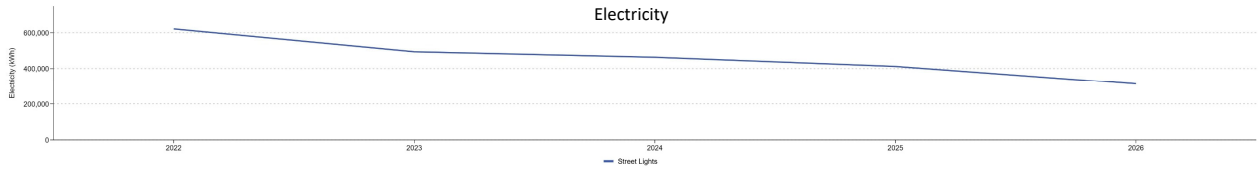
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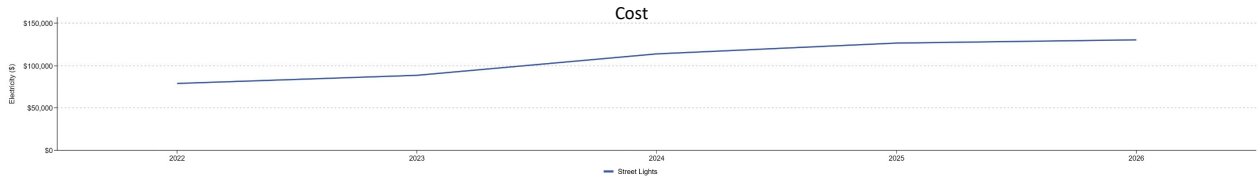


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Streetlights-LED Transition

- LED Transition project began in 2022 (Mercury Vapor and High-pressure Sodium)
- 49.7% decrease in energy usage over past 5 years
- Additional streetlights added





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Facilities Improvements

- Lighting
  - LED transition (Town Hall, Admin. Building, HPD, Stormwater Office, HWY 86, Gold Park and Cates Creek Park, Wastewater Plant, HPD Training)
  - Dimmer switches/timers (Town Hall, Admin. Building, Stormwater Office)
- Heating/Cooling
  - HVAC units/mini splits (HPD, Police Annex, Town Hall, Planning Manager's Office, Stormwater Office, DNJ Community Center, Water Plant, Museum)
  - Programmable thermostats and remote sensors (Town Hall, Admin. Building, HPD, DNJ Community Center)
  - Replace/repair broken windows (Town Hall)
- Water
  - Water heater timers (Gold Park restrooms)
  - Tankless water heaters maintenance (Annex)
  - Water conserving fixtures (HPD)
- Building Efficiency
  - Insulation/weatherization (Cemetery Office, Stormwater Office)
  - Duct cleaning (HPD, Police Annex, Wastewater Plant)
  - Insulated roof wrap and new shingle roof (Town Hall)
- Equipment
  - Energy Star kitchen equipment (Annex, DNJ Community Center)



Rod Jones, Facility Coordinator

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Information Technology

- New Lenovo laptops
  - Zero waste, plastic free packaging
  - More energy efficient
  - Longer battery term
- Existing laptops
  - Repurpose and reuse existing laptops for Public Works and Distribution/collection crews
- E-cycling electronic waste in coordination with Orange County
- Printers/copiers
  - Shift to shared copiers
  - Reduce paper and ink waste
  - Increase efficiency
  - Reduce maintenance issues



Chris Johnston, Information Technology Manager

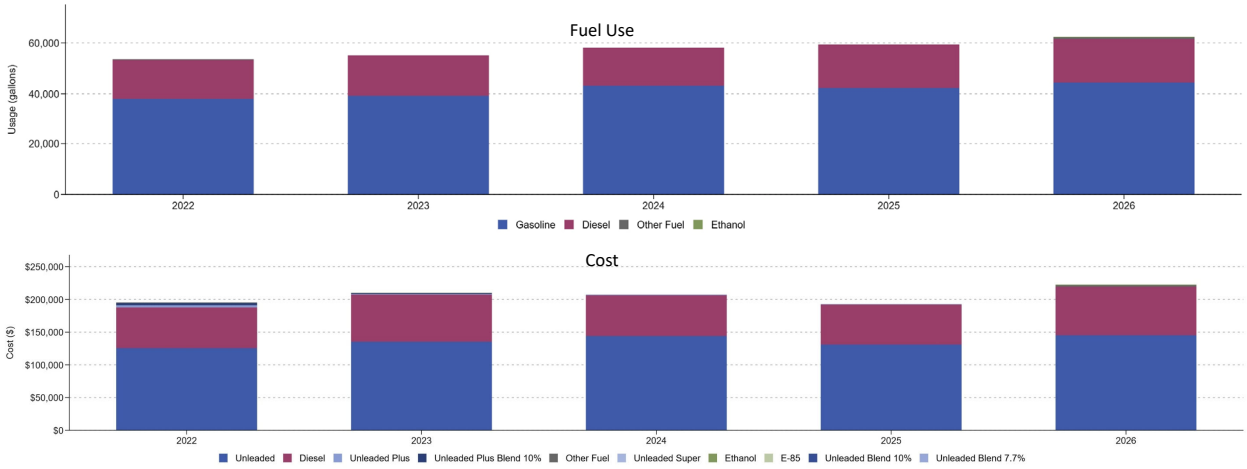
Utilities

- Variable Frequency Drive (VFD) at Wastewater Treatment Plant (2012)
  - What is a VFD?: Computer that is installed at pump station that allows us to program the speed on the pumps which reduces overall electricity and waste use- pump speeds are adjusted based on need
- VFD funded for install at Elizabeth Brady Pump Station (Fall 2027)
  - Will also help WWTP control flow coming into plant to make treatment process more efficient
- Programmable Logic Controller (PLC): at Elizabeth Brady (Fall 2027) and River Pump stations (TBD)
  - What is a PLC?: Computer that reads levels, flow rate, and pump speeds at pump stations to control VFDs



Fleet

- 16.7% fuel use increase over 5 years, 13.8% cost increase
- PD hybrid patrol cars increased fuel economy from 8 MPG to 18-20 MPG



Public Works

- Rightsizing vehicles and equipment
- Minimize trips to landfill
- Leaf deliveries in town- 100%
- Route optimization study (2027)
- Mini solid waste truck (replaced larger less efficient vehicle)
- Roll off leaf truck allows us to swap bodies utilizing one truck for multiple tasks



Future Train Station

- Net Zero Ready
- Solar Panels
- EV Charging
- Multimodal Access
- Transit Hub
- Green Infrastructure
- Green Roof
- Native Plants



STORMWATER MANAGEMENT

Solar Feasibility Study

PISGAH ENERGY
DESIGN & DEVELOPMENT

NV5

Site	Facility Name	Roof Type	Roof Ready For Solar	Replace Roof (Pre-Solar)	Roof Sections to Replace	Viable for Solar
1	Town Hall Annex	Asphalt Shingle	N	Y	Entire Roof	Y
2	Motor Pool/ 86 N Facility	Metal	N	Y	Entire Roof	Y
3	Water Treatment Plant	Rock Ballast	N	Y	Entire Roof	Y
4	Adron F. Thompson Facility	Metal, Membrane	Partially*	Y	NA**	Y
5	Wastewater Treatment Plant	Solids Building = Mod Bit, Filter Building = Membrane	N	Y	Entire Roof	Y

*The sections of the rooftop that are part of the facility expansion will be solar ready. **The structural engineer does not recommend that solar be installed on the existing rooftop without remediation efforts, making a rooftop replacement unnecessary at this time. Should solar be considered for the existing roof section at Adron the F. Thompson Facility, Pisgah Energy recommends having the existing membrane roof evaluated for remaining useful life or replacing it.

Solar Feasibility Study

- Internal rate of return (IRR) is a financial analysis that calculates the annualized percentage yield of a solar panel system
- Payback period is the time it takes for the cumulative electricity bill savings to equal the net upfront cost of the solar panel system
- Levelized cost of energy (LCOE) represents the average cost to build, operate, and maintain a solar asset over its lifetime divided by the total electricity it will produce. It lets you compare the cost of installing solar versus what it costs to purchase energy from the grid.

Facility Name	Project Size (kWdc)	Direct Pay Base Incentive	Project Budget	30 YR Energy Savings	Payback Period (YR)	30 YR IRR %	30 YR Levelized Cost of Energy/kWh
Town Hall Annex	30.07	$40,352	$134,508	$191,453	18.5	4.00%	$0.095
Adron F. Thompson Building	42.68	$47,309	$157,695	$221,133	19.7	3.70%	$0.089
Motor Pool / 86N Facility	29.75	$34,149	$113,831	$95,206	29.7	0.10%	$0.087
Water Treatment Plant	14.07	$27,240	$90,801	$47,776	> 30	2.50%	$0.133
Wastewater Treatment Plant	39.29	$48,539	$161,796	$133,745	> 30	0.00%	$0.095
Totals	**155.86**	**$197,589**	**$658,631**	**$689,313**	NA	NA	NA

Solar Feasibility Study

Solar Array Details

- System Size: 30.07kWdc / 22.8kWac
- Annual Production: 39,452kWh
- Electricity Offset by Solar: 73.4%
- CO2e Offset in Metric Tons: 24.7
- Number of Solar Panels: 62
- Racking Type: Flush Mount
- Design Constraints: Available Roof Area, Shading From Trees to the South

Roofing Overview

- Roofing Material: Asphalt Shingle
- Roof Condition: Recommend Conducting Roof Assessment to Determine Remaining Useful Life Prior to Installing Solar
- Dead Load Limit for Solar: 3psf
- Structurally Approved for Solar: Yes



TOWN HALL ANNEX
105 East Corbin Street, Hillsborough, NC 27278

Solar Feasibility Study

Solar Array Details

- System Size: 42.68kWdc / 34.6kWac
- Annual Production: 53,053kWh
- Electricity Offset by Solar: 207.6% (based on current energy usage at facility, this percentage will decrease with expected usage increase)
- CO2e Offset in Metric Tons: 33.2
- Number of Solar Panels: 88
- Racking Type: Flush Mount, Ballasted
- Design Constraints: Available Roof Space, Current Peak Demand of Facility

Roofing Overview

- Roofing Material: Metal, membrane
- Roof Condition: Condition of Existing Membrane NA (see structural note below), New Metal Section will be "Solar-Ready"
- Dead Load Limit for Solar: 3psf flush mounted, 7.5 ballasted
- Structurally Approved for Solar: Existing Rooftop - Not Approved, New Metal Section - Approved



Adron F. Thompson Facility
715 Dimmocks Mill Road, Hillsborough, NC 27278

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Ongoing Initiatives

- Reduce single-use plastics and Styrofoam at town events
- Climate Corner-Talk of the Town Employee Newsletter
- Green infrastructure/riparian restoration projects
- Leave the Leaves
- No Mow March
- Creek Week
- Climate Challenge
- Heat mitigation
- Solarize Hillsborough (2022-2023)
- EV Level 2 Suitability Analysis (2022)
- C-Pace program (2026)
- Free Repair Café (next one from 1pm-5pm on 11/14/2026 at Whitted)















Climate Corner

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Other Ideas

- Energy audits at town facilities
- Insulation and weatherization projects
- Smart thermostats and dimmer switches
- Transportation/transit planning
- Internal polices and employee engagement
- VFDs at Mayo Pump Station (Utilities)
- Study to eliminate 4 pump stations (Engineering)
- Lower horsepower motors: best efficiency points (BEP)
- Climate Action Plan Commitments Worksheet
- Community composting programs
- Renewable energy investment

