
Green Capital Needs Assessment Protocol

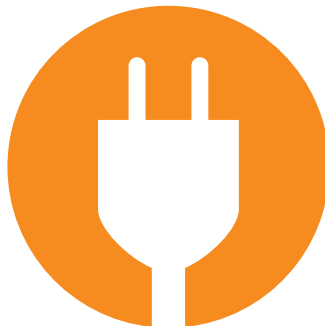


TABLE OF CONTENTS

Overview	3
Green Capital Needs Assessment Firm Qualifications	5
On-Site Visit	6
Energy Modeling and Energy/Water Savings Analysis	8
Green Capital Needs Assessment Report	9

B C D E F I J K L G A N M

Note: The attachments referred to in this section can be found at www.enterprisecommunity.org/retrofittoolkit

OVERVIEW

The Enterprise Community Partners **Green Capital Needs Assessment Protocol** (“the GCNA Protocol”), created in partnership with RECAP Real Estate Advisors (<http://on-site-insight.com/>), is a tool that combines a conventional 20-year Capital Needs Assessment with an energy audit to be used by property owners and underwriters. These two identify ways to save the maximum amount of energy and water at a property and capital improvements as cost efficiently as possible with an outcome that results in:

- 1 Reduced operating costs through increased energy and water efficiency
- 2 Healthier living environments by improving indoor air quality for residents
- 3 Decreased carbon emissions by reducing the property’s environmental impact

The GCNA Protocol ensures a quality report by providing templates and guidance to conduct a holistic assessment. The outcome is an investment grade report that includes rigorous data analysis and financial analysis for each recommended measure. In the end, you’ll know which product to use, when to install it, and how much you will save.

The GCNA includes:

- Standard CNA with 20-year capital needs projections
- Replacement Reserve analyses for both green and conventional measures
- Side-by-side comparisons of Conventional and Green capital needs
- Current Energy Use and Cost
- Total Reduction in Energy Use and Cost for Recommended Measures
- Energy and Water Conservation Measures (EWCMs) that could be installed
- Green Measures (GMs) that improve comfort, indoor air quality and safety with diagnostic testing results, if needed, that could be installed
- Life Cycle Cost Analysis and Estimated Useful Life (EUL) for each recommended measure
- Financial payback of each measure using net present value (NPV), internal rate of return (IRR), savings to investment ratio (SIR), and simple payback
- Methodology for data collection, energy modeling software and assumptions used to make the projections
- Qualifications and certifications of all those who worked on the audit
- Representation that the Audit meets the Enterprise Audit Protocol as defined here

OVERVIEW

The main process that constitutes the GCNA Protocol includes:

- On-site visit
- Energy Analysis
- Financial Analysis
- Reporting

This GCNA Protocol is derived from the following standards: Building Performance Institute, Inc. Technical Standards for Multifamily Building Analyst (2008); HERS II 2008 Technical Manual; California Title 24-2008; HUD, Energy Conservation for Housing; A Workbook; RESNET, ASHRAE; Fannie Mae Green Refinance Plus: Green PNA (2011)

GREEN CAPITAL NEEDS ASSESSMENT FIRM QUALIFICATIONS

The Green Capital Needs Assessment Protocol requires that auditors perform the following tasks:

- Energy modeling and/or energy analysis
 - Building assessment
 - Replacement reserve analysis
 - Diagnostic testing
 - Combustion appliance safety and indoor air quality testing
 - Feasibility analysis for the installation of renewable energy retrofits
 - Construction cost estimating
 - Financial analysis that generates investment-grade-level information SIR, life cycle cost analysis, simple payback
 - Integrated pest management plan inspection
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In recognition that a single firm may not be able to fulfill all the requirements of this audit protocol, multi-disciplinary teams can be assembled for their complementary skill. Potential team members may include, but are not limited to:

- BPI multifamily analyst
- Certified Energy Manager (CEM)
- Licensed mechanical engineer
- Licensed electrical engineer
- Energy modeler
- General contractor
- Certified green building professional
- Home Energy Rating System (HERS) rater
- Retro commissioning agent
- Renewable energy expert
- Licensed architect
- Financial expert
- QualityPro Green, GreenShield or EcoWise-trained pest management professional

ON-SITE VISIT

Prior to the on-site visit, we suggest that a pre-audit meeting or conference call be conducted with the following parties:

- Auditor and their team members
 - Owner (to include property operations and maintenance staff)
 - Local jurisdictional staff (optional)
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We recommend that the pre-audit meeting occur prior to finalizing the contract for audit services with the owner. The purpose of the pre-audit meeting is to establish and confirm the understanding of the following variables:

- Owner expectations and prioritization of building improvements
- Historical utility data (at least 12 consecutive months and ideally 24 consecutive months)
- As-built drawings from the original construction and any rehabilitations
- Recent operations and maintenance issues (i.e., leaks, indoor air quality, pests)
- Diagnostic testing to be conducted, if applicable
- Any previous PNAs or audits done on the property
- Energy modeling software to be used, and the outcome that will be reported in the final audit document
- Wage rates to be factored into the construction cost estimates, if applicable
- If any subsidy or incentive funds may be involved in the project, discuss requirements that will impact the audit inspection, testing and written report

ON-SITE VISIT

The **on-site visit** will take place on the day of the site inspection. The purpose of the on-site visit is to collect all necessary information to conduct an appropriate energy, water, physical condition, health, and environmental analysis, including sufficient information to inform an energy model and financial analysis. The intent is to interview property owners and managers, evaluate the building envelope, assess building airflow, inventory HVAC equipment, identify ventilation system operations, field verify fan operation, and perform other diagnostic testing.

Attachments

- B** On-Site Visit Guidelines
- C** Site Visit Preparation
- D** Potential Operations & Maintenance Problem Worksheet
- E** Inspection Worksheet
- F** Equipment Specifications Worksheet
- I** Diagnostic Testing Guidelines

ENERGY MODELING AND ENERGY/WATER SAVINGS ANALYSIS

An energy model of the building's pre- and post-retrofit performance shall be completed using utility data, building plans, initial inspection data and diagnostic data collected during the on-site visits. The energy model is used to estimate annual energy consumption, carbon savings and energy cost savings associated with each potential energy conservation measure. Current operating schedules verified on site are to be used for energy and energy cost savings estimates. Software to be used shall be either EnergyPro, TREAT or other as approved by Enterprise.

All major assumptions used to develop the energy model and analysis must be clearly stated in the final report. Reporting emphasis should be placed on the assumptions that have the most impact on estimated energy savings. Occasionally, some building features may be inaccessible, such as wall and attic insulation. When certain building features cannot be physically verified, the default conditions should be identified as well as the justification for them.

Attachments

- J** Energy and Water Audit Guidelines
- K** Energy Modeling Reporting Requirements
- L** Energy Modeling Input Assumptions Table for more details on the energy modeling and analysis process
- G** Utility Release Form for guidance on collecting utility data from residents

GREEN CAPITAL NEEDS ASSESSMENT REPORT

EXECUTIVE SUMMARY

The Executive Summary shall summarize the major findings of the audit including:

- **A** Recommendations – **Green Capital Needs Assessment Summary Table** (*Attachment A*)
- Green Capital Needs Assessment Overview
- Project summary & description
- Critical repairs
- Non-critical repairs
- Near term replacement reserve summary years 1-10
- Long term replacement reserve summary years 11-20, if applicable

SITE VISIT BACKGROUND

This section includes information on weather conditions, site visit participants, unit sampling, documents (e.g., as-built plans) and records (e.g., Operations and Maintenance reports provided by the owner).

NARRATIVE

This section includes information on existing conditions, description of the conventional replacement measure and description of the green alternative (EWCMs and GMs) organized into the following categories:

- Site systems
- Mechanical/electrical
- Electrical
- Architecture
 - Building exterior
 - Roof systems
 - Building interior common areas
 - Community rooms, kitchens, lobbies, corridors, commercial spaces
- Dwelling units
 - Living area finishes
 - Bathrooms
 - Kitchens
 - In-unit mechanical
 - In-unit electrical

GREEN CAPITAL NEEDS ASSESSMENT REPORT

**ENERGY AND
WATER AUDIT
ANALYSIS**

This section of the narrative should describe:

- Energy and water analysis methodology
 - Utility analysis and end-use breakdown
 - Source of information
 - **Energy Modeling Input Assumptions Table** (*Attachment L*)
 - Energy model documentation
 - Energy savings summary
 - Equipment (HVAC, DHW) sizing methodology
 - Benchmarking (if applicable)
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Additional attachments

- **Energy and Water Audit Guidelines**
- **Energy Modeling Requirements**

GREEN CAPITAL NEEDS ASSESSMENT REPORT

RECOMMENDATIONS This section will provide information on Energy Efficiency, Water Conservation, Health, Green and Capital Improvement, including but not limited to:

- Description of measures and recommended loading order
- Rationale for recommendation
- Estimated useful life of existing component
- Recommendation for when to implement the measure/replacement/improvement
- Identification of how cost estimate was derived (including source of cost information, unit pricing, take-off used)
- In the absence of renewable energy opportunities, explain why these are not recommended
- Non-energy related benefits of the recommended measures such as health and safety, improved indoor air quality and increased resident comfort

A Auditors will present this information in the **Green Capital Needs Assessment Summary Table** (*Attachment A*) that includes the most cost-effective combination of recommended measures and improvements factoring in loading order, available funding, estimated useful life of existing equipment/systems and the property owner's goals.

This section will include the results of the diagnostic testing conducted on site and describe how the test results informed the rationale for the above recommendations. Auditors may also offer recommendations for the retrocommissioning of certain existing equipment based on diagnostic test results.

This section of the report will also include a summary of the combustion analysis testing completed during the energy audit. For all audited dwelling units, include the results of combustion safety testing and identify if action was warranted as a result of the combustion safety testing. Report recommendations to include CO detectors to the extent the dwelling units don't have them installed.

Additional attachment

I **Diagnostic Testing Guidelines**

GREEN CAPITAL NEEDS ASSESSMENT REPORT

CODE COMPLIANCE

This section documents any issues related to compliance with all applicable codes and regulations including local Building Code, Local Housing Code, Americans with Disabilities Act-Title III, Fair Housing Accessibility Guidelines, Life Safety Code/ National Fire Protection Association (NFPA), Minimum Property Standards (MPS) HUD Handbook 4910.1 and Uniform Federal Accessibility Standards (UFAS)/ Section 504.

REPLACEMENT COST CALCULATIONS

Provides details on the methodology used to derive the calculations and the final values.

QUALITY ASSURANCE AND VERIFICATION (QA&V) PLAN

N

If applicable, this section shall include a written QA&V plan specific to the subject property. The plan shall include requirements for inspections, documentation and performance test-outs. Refer to **Quality Assurance and Verification Guidelines** (*Attachment N*).

WHOLE BUILDING ENERGY CONSUMPTION DATA

The auditor shall evaluate the feasibility of installing a master meter for the property, in cases where the tenant spaces are individually metered and whole building consumption data is unavailable directly from the utility; or evaluate another cost-effective method to deliver whole building energy consumption data to the owner on a monthly basis, at a minimum. The auditor must collect data in the attached form.

Additional attachments

G

Utility Release Form

GREEN CAPITAL NEEDS ASSESSMENT REPORT

INTEGRATED PEST MANAGEMENT PLAN INSPECTION

A qualified Contractor, certified by QualityPro Green, GreenShield or EcoWise will perform an Integrated Pest Management Plan Inspection (IPMI). The contractor, during the first site visit, will interview property management about existing pest control practices, place glue traps and schedule a date to retrieve the traps. Based on the results of the glue trap evidence, the contractor will conduct targeted unit and property inspections during a second visit. The contractor will submit a narrative report that describes the inspection process and results, identifies deficiencies in the current pest control strategies and practices and recommends practices that adhere to Integrated Pest Management principles and achieve better outcomes.

The inspection process and reporting requirements are described in more detail in

M **Integrated Pest Management Guidelines** (*Attachment M*)

CERTIFICATION/ REPRESENTATION

This section includes a representation from an officer or owner of the audit firm that the audit meets the Enterprise Green Capital Needs Assessment Protocol without exception and that the final audit report has been reviewed for quality assurance purposes by a principal or officer of the firm.

APPENDICES

- Capital needs schedules
- Replacement reserve analysis
- Property photographs
- HUD forms 92329 and 92264 (if applicable)
- Site map
- Municipal compliance letters
- L** • **Energy Modeling Input Assumptions Table** (*Attachment L*) completed
- G** • **Utility Release Form** (*Attachment G*)
- A** • **Green Capital Needs Assessment Summary Table** (*Attachment A*)
 - Payback analyses for each measure comparing green to conventional
 - Integrated pest management report and exhibits