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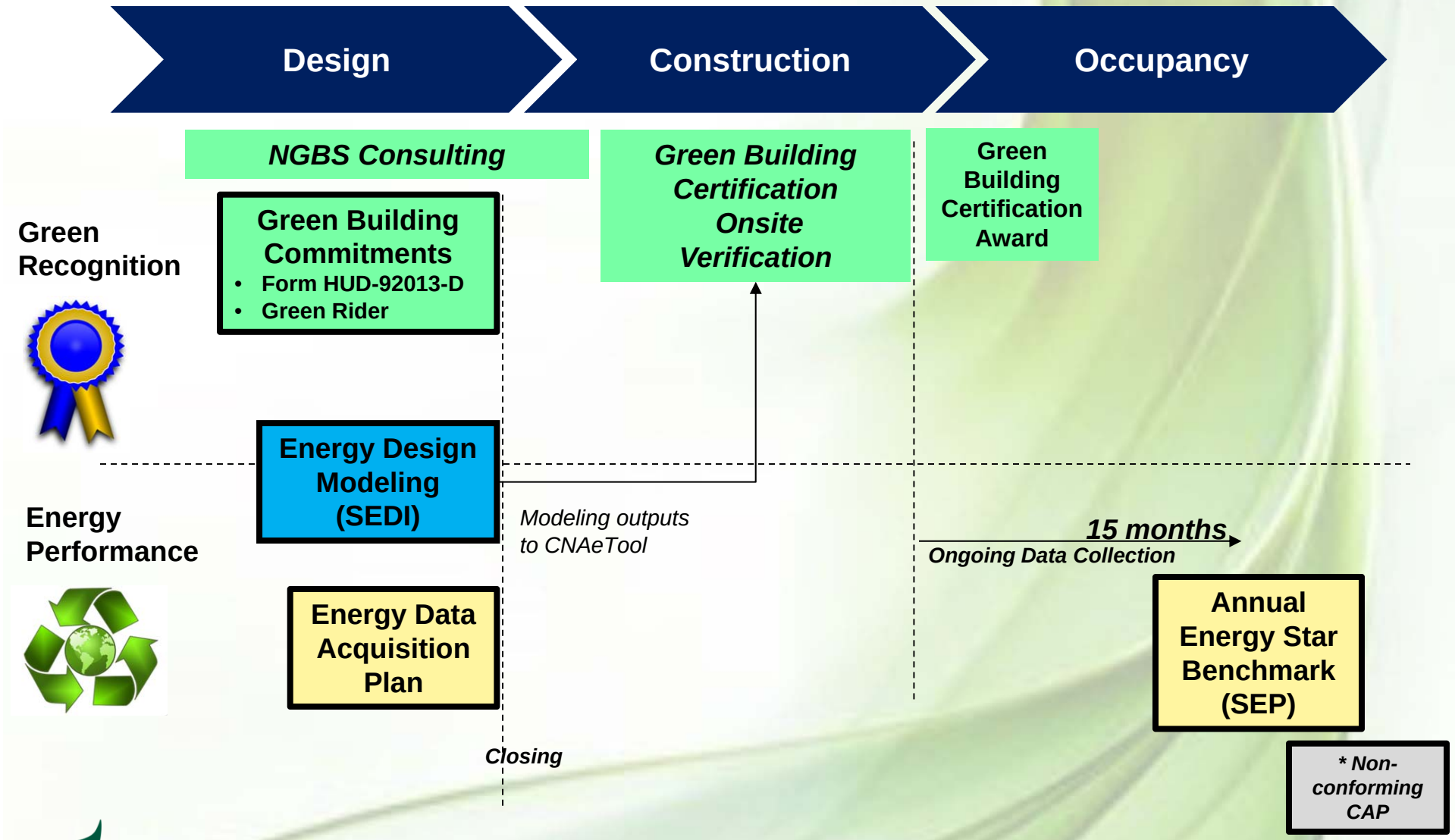
Green Mortgage Insurance Premium Reduction Program
Section 221(d4) New Construction

Q2 2018

Green MIP requirements span all phases of a project

221(d)(4) NC or Gut Rehab example

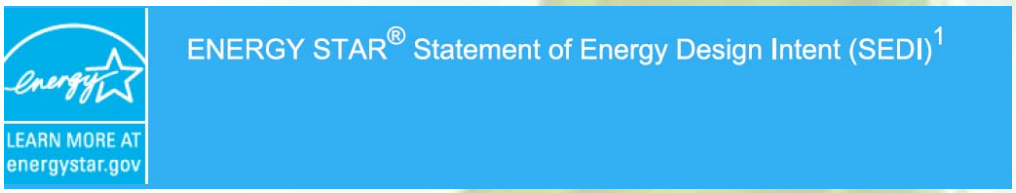


ENERGY STAR Portfolio Manager
Statement of Energy Design Intent (SEDI)
Statement of Energy Performance (SEP)

For New Construction, early energy modeling can help identify the most cost-effective approaches to achieve a SEDI score of 75+

Case Study:

- **18 low-rise garden style buildings**
- **380 dwelling units located**
- **South Region (~3,200 HDD, ~900 CDD)**



Original Design	Improved Design	Additional Options
R-38 Fiberglass Batt insulation at top-floor ceiling	R-49 Blown Insulation (air-sealing/Grade 1)	High Performance Windows and additional air sealing
HVAC 14.5 SEER / 8.2 HSPF	HVAC 16 SEER / 9+ HSPF	Incorporate Natural Gas
Few Energy Star Appliances	All Appliances Energy Star	Additional LED Lighting
Portfolio Manager SEDI Score 72	**Portfolio Manager SEDI Score 78**	**Portfolio Manager SEDI Score 80+**

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Red Flags and Reasonable Tests for reviewing SEDI report

Review for Completeness and Reasonableness

- **Incorporate all energy used which includes amenities (e.g. heated pools), common space (clubhouse), corridors, exterior lighting, etc**
- **Sufficient number of units modeled**
- **Infiltration rates should not be less than 0.28 ACH-NAT without explanation**
- **Tenant HVAC setpoints should be realistic 70 for Heating and 75 for Cooling**
- **Specifications of higher-efficiency HVAC equipment as well Energy Star appliances and lighting**
- **Accurate treatment of parking and garages**

Eligibility

- **ENERGY STAR benchmarking for Multifamily Housing is only available to properties with**
  - 20 units or more (per campus, not per building)

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Experienced, accredited modelers will ensure robust and appropriately conservative modeling

Example of how differences in modeling can impact property energy use

Modeling Parameter	Change/Explanation	Impact on Forecasted Energy Use
Complete inclusion of Multifamily amenities (e.g. heated pools), common space (clubhouse), corridors, exterior lighting, etc	Examples: Missing the common space lighting, heating/cooling or systems such as ventilation, elevators or pools	Risk of missing up to 20% of the total property energy use
Unit Selection (Bottom/Middle/Top)	Middle floor units have conditioned space above and below and thus are more energy efficient. (4% different in this scenario)	A 3-story building that was modeled with just the middle floor unit would appear to be 2.7% more efficient than a model that more accurately reflected the difference between the levels
Construction Process (infiltration rates)	Aggressive modelers may assume that the air infiltration rates are uniformly better than averages. A conservative approach assumes 0.35 air changes per hour(ACH) but a more aggressive model could claim a 0.20ACH	Aggressive assumption forecasts 2.7% less energy use
Construction Process: Insulation Installation	Changing from a grade-3 installation to a grade-1 installation	More aggressive assumption forecasts 1.2% less energy use
Occupant Behavior (Temperature Set-points)	EPA suggests set points of 70 for Heating and 75 for Cooling. Even slightly more aggressive assumptions adjusting the set-points by 2 degrees to 68 for heating and 77 for cooling	More aggressive assumption forecasts 3.2% less energy use

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Source: Analysis to demonstrate some parameters and modeling assumptions can affect an energy forecast. To avoid cherry-picking extremes this is based on an above-code Multifamily property in Virginia which represents a moderate climate

The Energy Data Acquisition Plan is required to ensure ownership is prepared for the annual benchmarking requirement

Data Collection Options

Master Metered Utilities

Collect monthly utility bills for every meter associated with the property

Tenant Paid Utilities

Request Whole-Building Aggregated Data from Utilities

In limited regions, utilities will provide the whole-building aggregated energy data without requiring individual releases

Limited availability

Secure Tenant Authorization/Release

Tenants sign release form allowing the owners to request energy usage from the utility (req. @ least 25% sample of representative units)

Time consuming and challenging to secure releases

Install Energy Data Loggers

Install digital, remote reporting master metering data logger upstream of tenant meters to capture all usage

Modest upfront cost

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