

Arlington County's Decarbonization Tool for Existing County Facilities

Arlington County has **aggressive climate goals to achieve carbon neutrality** by 2050. Specific strategies within the County's Community Energy Plan address energy and emissions reductions for multiple sectors, including government operations. The County has **over 90 facilities with a diversity of end uses, building types, energy load profiles and other characteristics** with differing energy efficiency, electrification and decarbonization opportunities. The goals for existing building decarbonization along with the diversity of facilities and building types led Arlington County to **develop a creative and custom analytic tool that can provide more insights into the potential facility upgrade opportunities.**



The County, with consultant support, designed and created a custom analytical tool (Decarb Tool) for **decision-support and prioritization of decarbonization opportunities** in existing County facilities. This tool was designed to include extensive data collection of facility characteristics data, asset condition inventory data, monthly utility data, and 30-minute electricity interval data. Also developed in the tool was an energy efficiency, electrification, and decarbonization measure database that could be applied to the facility energy models to create alternative measures and measure combinations scenarios. Lastly, the various **modeled scenarios were assembled into the Power BI-based Decarb Tool that allows for further analysis, comparison, and visualization** of the developed scenarios.

The Decarb Tool's first phase featured twelve facilities that were selected from the County's portfolio of facilities for the in-depth energy modeling of multiple measures that developed alternative scenarios. Each scenario then had equipment, fuel and operations, and maintenance cost data and greenhouse gas emissions (GHG) impact data applied. The quantified scenarios with key energy,

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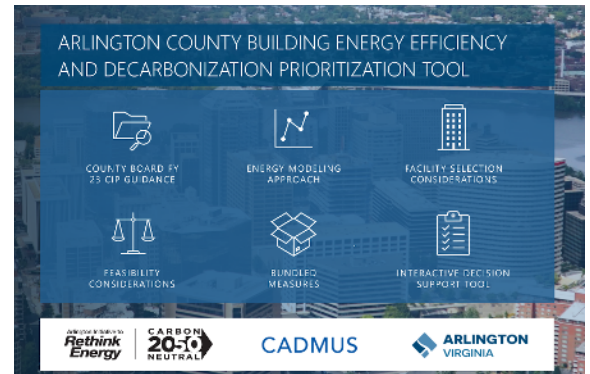


2023 ENERGIZING EFFICIENCY CASE STUDY

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GHG and cost metrics can be compared and prioritized for implementation, along with the identification of high-level feasibility consideration inputs. Feasibility considerations included items such as electric panel upgrades or dependency in order of implementation for measures were considered. The first phase of the Decarb Tool development was completed at the end of 2022.

Selected scenarios from the Decarb Tool are currently being integrated into the design and engineering process for facility upgrades.



An example of the tool's application is a community center that currently has HVAC equipment nearing the end of its useful life. The Decarb Tool **modeled scenarios for the HVAC upgrades**, with the scenario utilizing variable refrigerant flow system and ductless mini-split air source heat pumps being selected as the HVAC equipment scenario to advance to the design phase for this project. Additionally, **insulation and window upgrades, lighting, and building automation system integration were identified as measures for further evaluation and bundling with the HVAC upgrade, with a modeled annual greenhouse gas emissions reduction of nearly 50%** from the current baseline for these measures.

The Decarb Tool is a key decision-support tool for identifying, planning, and prioritizing energy efficiency, electrification and decarbonization opportunities in existing facilities that **provides the ability to compare and analyze potential upgrade scenarios** on key metrics. Additionally, the Decarb Tool is a **catalyst to enhance the equipment upgrade planning process and drive deeper energy and carbon savings** that are critical to achieving climate and energy goals.

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