For BED's next IRP...

Introduction

An Integrated Resource Plan (IRP) is an electric utilities' plan to meet the future energy needs of its customers at the lowest cost, including both economic and environmental costs. Vermont utilities are required to file an IRP with the Department of Public Service every 3 years. Following its 2016 IRP, the Public Utilities Commission (PUC) asked Burlington Electric Department (BED) to:

- research measures to control customer loads remotely or through incentive programs,
- analyze the costs of energy transformation (Tier 3) projects in terms of first year acquisition costs and discuss how incentive levels for Tier 3 projects were established,
- provide an evaluation of the continued operations and economics of the McNeil Power Plant, and
- provide an assessment of pilot projects for the next IRP that is due in 2020.

In addition, BED is exploring opportunities to improve the IRP process through greater integration, robust uncertainty analyses, market modelling, comprehensive societal cost evaluations, valuations of the land impact of energy resources, and the impact of climate change on load growth.

The objective of this project is to identity or create models that BED could use in the next IRP to address the requests of the PUC and develop recommendations on how BED could improve their IRP process in general.

Methods

The following resources were used to identify or develop models to address the issues described above and improve BED’s IRP process:

- IRPs from other utilities
- White papers and peer reviewed literature
- Interviews with BED staff and external experts

Results/Discussion

Tier 3 incentives: Literature on the elasticity of technology adoption indicates that reducing financial barriers will increase adoption, but the alternative compliance payment limits BED's ability to increase incentive amounts.

Load Flexibility

Introduction

Load flexibility involves shifting energy use from periods of high demand and high energy prices to periods of lower demand. This allows for less curtailment and greater integration of renewable energy as weather patterns driving renewable production do not perfectly match demand. Additionally, load flexibility allows energy use to be shifted away from peak times, which reduces capacity and transmission costs.

Methods

Typical end-use load profiles of commercial buildings and literature on the schedulable load from end-uses during peak energy events were used to estimate the demand response potential (the ability to decrease, increase, or shift load) of commercial and City buildings in Burlington.

Results/Discussion

The size of the "virtual battery" that could be deployed in City buildings during peak energy times has been estimated to be 1.10-1.3 MWs (for the ISO-New England system peak). If BED can leverage this battery, approximately $116,000-131,000 of savings could be realized. A spreadsheet tool has been developed that can be used to assess the peak savings that could be achieved for BED for any commercial building in Burlington and the bill savings a customer could receive under a dynamic rate structure.

References