

Project Overview & Objectives

About Green Communities and Annual Reporting

Massachusetts municipalities designated as Green Communities commit to reducing municipal energy use by 20% over five years. Each year they submit an Annual Report through MassEnergyInsight (MEI) to demonstrate progress and remain eligible for grant funding.

The reporting challenge

Reviewers from DOER and contractor ICF generate comments when data is missing, inconsistent, or unusual. Over 900 comments in FY25 created significant burden on both sides.

Project goal

Identify which report sections, issue types, and regions generate the most activity, then develop targeted recommendations to address root causes before submission.

Approach and Methods

How the analysis was structured

Classify comments as issues or non-issues

Reviewed Annual Report comments to separate flagged reporting problems from resolutions, confirmations, and informational follow-ups.

Tag each issue by category and type

Built a taxonomy of 7 broad categories and 16 specific tags to identify recurring issue patterns, such as missing facility data, increase outliers, and ECM-related gaps.

Merge with regional and program data

Using R, I joined the Annual Report comments dataset with Green Communities regional data to analyze patterns by region, utility, program status, and reviewer group.

Identify patterns and develop recommendations

Used issue concentration by report section, category, and region to identify high-friction areas and develop targeted recommendations to improve reporting efficiency.

Deliverables and Findings

943

Total review comments analyzed

586

Comments flagged as actionable issues

7

Issue categories Across 16 tags

298

Designated Green Communities in MA

Where are problems most concentrated?

Energy Summary

322

ECMs

87

Vehicle Stock

53

Renewable Energy

43

Stretch Code

35

Findings: Energy Summary accounts for more than half of all flagged issues, driven by missing facility data and outliers at the building and utility account level.

What types of issues come up most?

Missing / Incomplete Data

199

Data Outlier

161

Data Quality / Classification

94

General Clarification

87

Permit

23

The top three categories account for >70% of flagged issues and can all be addressed through system-level checks and guided data entry earlier in the process.

Which regions see the most issues?

Northeast

188

32% of flagged issues

Western

176

30% of flagged issues

Southeast

134

23% of flagged issues

Central

88

15% of flagged issues

Note: Dataset reflects comments through late February 2026 and may not represent final totals.

Main Suggestions and Takeaways

1) Automated outlier detection with required explanation

When a facility's year-over-year energy consumption changes beyond a defined threshold (for example, more than 50% and more than 50 MMBTU in absolute terms), MEI would surface a prompt asking the municipality to explain the change before submitting. A dual threshold considering both percentage and absolute magnitude prevents false alarms for small facilities where large percentage swings carry little practical significance.

2) Mandatory field validation

Missing data is one of the largest source of review comments. If MEI automates a reminder when critical fields are empty and highlights those fields for the municipality, many issues would be caught before the report reaches reviewers. For ECM data specifically, a confirmation prompt asking whether the municipality has active or planned ECMs would ensure that empty entries are intentional rather than oversights.

3) Priority-ranked issue summary on the MEI home screen

A persistent summary on the MEI home screen could flag outstanding data quality issues before Annual Report season, helping municipalities stay on top of requirements throughout the year. Color coding by severity would help prioritize attention. Focusing on a short list of high-priority items, rather than a comprehensive log, makes the summary actionable for staff who check MEI only periodically.

Takeaways:

Through this internship, I learned that clean energy work depends not only on strong policies, but also on the support systems that help communities implement them. Municipalities need clear guidance, technical assistance, funding, and practical tools to move projects forward. I also learned that data and reporting are a bigger part of climate work than I expected. Accurate reporting helps DOER understand municipal progress, identify challenges, and support communities more effectively. Another key takeaway is that long-term planning matters. When programs provide funding or incentives, teams also have to think about what happens after the funding period ends and whether the project can continue sustainably.

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CELT Fellowship Celebration
June 16th | Boston University