#1: CITY BUILDINGS & LIGHTING
CORE METRIC FOR CATEGORY A & B & C CITIES
Bold, green font indicates data elements that are eligible to be recognized at Step 5 if improvement is demonstrated.

DATA ELEMENTS

City Buildings:
- 1.1 kBtu per square foot, per year
- 1.2 Dollars spent on energy per square foot, per year
- 1.3 Ratio of actual energy use to predicted energy use

Percent of LEDs in:
- 1.4 Street lights
- 1.5 Traffic signals
- 1.6 City buildings & property

DEFINITIONS

- **City buildings** include all city-owned or leased buildings fueled by two or more sources of energy. Excluded are unheated garages, pump houses, and some park buildings. Category C cities may not own or lease such buildings and thus do not report these three data points. **Water use** by city buildings and properties is reported under Metric 10: Drinking Water. (Elements 1.1-1.3)

- **Ratio of actual energy use to predicted energy use** – This is called the B3 Benchmark Index Ratio – it is an engineering model that predicts how much energy all buildings would use if they were built to and operated under the current State energy code. This ratio divides the actual energy use for the most recent twelve months of data available by the predicted energy use for the same period, and expresses the result as a number. Numbers 1.0 or under mean the city's buildings are performing better than predicted. (Element 1.3)

- **Street lights** include all street lights owned by the city and all those owned by any utility under a franchise agreement and should be counted as one fixture, regardless of the number of bulbs contained. (Element 1.4)

- Each **traffic signal** should be counted as one for purposes of calculating a percentage; thus, as sometimes only one of the three colors is changed out before changing out another color, counts may include 0.33 of a signal. (Element 1.5)

- **City buildings & property** includes both interior and exterior lighting for buildings (interior includes ambient and task lighting fixtures), garages, other city facilities (e.g. drinking/waste water plant), parking lots and ramps, ball fields, park lighting, trails, and the like. (Element 1.6)

- **Alternative data elements**: if you have been gathering or want to gather slightly different data, report those and explain in the notes section of the GreenStep reporting spreadsheet why they are a better fit for your city. For example, you may use Energy Star's Portfolio Manager or a proprietary building program, though GreenStep has not seen the ability of these programs to calculate actual-to-predicted ratios based on Minnesota's changing building code, nor to compare your city's data to other city data by type of building in Minnesota.

DATA SOURCES

- B3 Program Data at https://mn.b3benchmarking.com (Elements 1.1-1.3)
  - Note: Energy bill data through December 31st for all buildings must be put into the B3 system before the system can accurately calculate the GreenStep measures.
- Public works data; work orders; city purchasing data. (Elements 1.4-1.6)

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- Utility data reported under franchise agreements. (Elements 1.1-1.3)

CALCULATION AND PUBLIC REPORTING

- **Category C GreenStep cities** that do not own or lease buildings should note that on the Step 4 reporting spreadsheet.

- **kBtu per square foot, per year** in all city buildings is calculated by the B3 database for the year proceeding the reporting year. When logged into your City's B3 Benchmarking Database page, use the "Report" dropdown menu to select EUI Report. Click "Show Report Options" and set the "Duration" section dropdown as Jan to Dec for the reporting calendar year. In the "Consumption Summary By Year" table, report the number shown under "Actual kBtu/SF." (Element 1.1)

- **Dollars spent on energy per square foot, per year** in all city buildings is calculated in a similar way by the B3 database for the year proceeding the reporting year. Under the REPORTS tab, use the "Report:" dropdown menu to select EUI Report. Click "Show Report Options", then under the "Meters & Units" section and the "Units" dropdown menu select Dollars. Set the "Duration" section dropdown as Jan to Dec for the reporting calendar year. In the "Consumption Summary By Year" table, report the number shown under "Actual Dollars/SF." (Element 1.2)

- **Ratio of actual energy use to predicted energy use** is also calculated in a similar way by the B3 database for the year proceeding the reporting year. Under the Reports Tab, use the "Report" dropdown menu to select Benchmark Report. Click Show Report Options and set the "Duration" section dropdown as Jan to Dec for the reporting calendar year. In the "Consumption Summary By Year" table, find the number under "Actual kBtu/SF" (includes only the sites that can be benchmarked), and divide it by the number under "Benchmark kBtu/SF" to get a ratio above or below 1.0 (lower is better) and report the ratio. If there is no Benchmark number, report the number shown next to "Index Ratio" from the BENCHMARK tab, note on the report where the number was taken from, and contact the B3 staff to correct the problem on the REPORTS tab. (Element 1.3)

- **Percent of LEDs** can be a calculated number or an estimated number. First, count or estimate the number of installed LED fixtures in street lights on the December 31st before the reporting year. Then, divide by the count or estimate of total street lights. Repeat this procedure for traffic signals and building/property lights. Express the ratios as percentages. (Element 1.4-1.6)

RATIONALE

In city buildings, the owner is also the tenant and thus all cost savings from short and long-term efficiency investments will accrue to the city and its taxpayers. Additional benefits from such investments include reducing greenhouse gases and lowering exposure to fuel price volatility. Energy efficiency (and other sustainability) opportunities abound in existing buildings, which are in a constant drift toward inefficiency. Many of the opportunities not only reduce operating costs, but improve occupant quality of life, create higher resale value, and improve worker productivity. The B3 database allows cities to compare sq. ft. energy use among all buildings of the same type across Minnesota. This makes it possible to target energy improvements to the lowest-performing buildings, investments which yield the greatest ongoing payback.

LEDs: probably the easiest and most cost-effective measure a city can do to improve energy efficiency is to convert lighting to LED technology. Payback periods can often be measured in months, not years. Utility and other financial incentives exist, and city staff need only assess and choose equipment, vendors and payment options. Therefore this is a simple measure that aims to focus attention on completing a transition to 100% LED fixtures such that savings begin accruing faster.

STEP 5 TARGETS

Though no state targets exist for cities, a relevant target is an Executive Order that requires state agencies with operational control over state buildings to achieve an aggregate 20% reduction in energy use from the baseline data entered into the B3 Benchmarking tool after the agency initiates their energy improvements. 20% in the Executive Order is a cumulative number

over many years: a very large reduction for one year unless most of the city's buildings undergo major retrofits at the same time. Year over year improvement targets are move reasonably in the 2 -5% range. To calculate yearly improvements:

Under the Reports Tab, in the Report drop down menu, select Baseline Report. Click Show Report Options, then in the Duration section set the dates from Jan to Dec of the reporting calendar year. Then, in the Options section, check Weather Normalize, and immediately underneath select Normalize Baseline from the dropdown menu. In the Comparison section, select Baseline and then click on the calendar and in the Baseline Editor that pops up click on January of the calendar year immediately preceding the reporting calendar year (e.g. Jan 2014 for CY2015). Click on Save and Close. Report both the Change From Baseline kBtu/SF and the % Change.

NEED HELP? CONTACT

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