

# Advancing Energy Efficiency, Renewable Energy & Electric Vehicle Policy in the St. Louis Region

June 2020



Developed by USGBC-  
Missouri Gateway Chapter  
with support from Washington  
University in St. Louis and  
Bloomberg Philanthropies



**Missouri  
Gateway**  
CHAPTER

 **Washington**  
University in St. Louis

## INTRODUCTION

Cities around the world have stepped up to set aggressive climate goals. Over 289 cities and counties have signed on to **We Are Still In**, an effort to support climate action at the local level by reducing greenhouse gas emissions 28% by 2025 and 80% by 2050, relative to a 2005 baseline. Locally, the City of St. Louis, Maplewood, and University City are signatories to We Are Still In. In October 2019, the City of St. Louis adopted an even more aggressive commitment to **reduce its greenhouse gas emissions 100% by 2050**. OneSTL is St. Louis' regional sustainability collaboration to create a more prosperous, vibrant and healthy St. Louis. OneSTL's Energy & Emissions working group supports the We Are Still In goal and works to leverage opportunities and create synergy between entities addressing climate change in the St. Louis region.

To address climate issues effectively, we need leadership and collaboration from all sectors: local, state, and federal; public and private; and higher education institutions and non-profits. There is no silver bullet to solve the problem – solutions have to come from and be implemented through **policy and voluntary efforts**, sometimes with financial support and sometimes providing financial gain. Solutions also have to reflect the link between climate change and other systemic social issues, such as equity, environmental justice, and public health, which must be addressed together. The solutions outlined in this toolkit are some of the most accessible and impactful opportunities we can implement at the local level.

This toolkit focuses on policy and action related to buildings and transportation because these two sectors contribute the majority of emissions in cities in the US. Not only do these strategies have environmental and climate benefits, they have financial benefits, create jobs, reduce dependency on resources from outside the US, improve public health, and reduce existing environmental injustices. Local action and local relationships are more important than ever – **our local governments can inspire, mandate and encourage action related to:**

- **Energy Efficiency in Buildings**
- **Renewable Energy Strategies, and**
- **Electric Vehicle Infrastructure.**

This toolkit is not comprehensive of every action a local government can take to address climate change. It is focused on a few of the most **impactful and accessible actions**, some of which have already been implemented locally. Emissions related to transportation, in particular, will not be fully addressed by this toolkit. Substantially reducing transportation emissions requires many more local and regional actions, such as land use planning, bolstering public transit, investing in bicycle and pedestrian infrastructure, and reducing reliance on single-occupancy vehicles.

For each of the topics covered – Energy Efficiency in Buildings, Renewable Energy Strategies, and Electric Vehicle Infrastructure – this toolkit outlines specific policy and action, providing:

- Recommendations on where to find sample policy language,
- “Walking the talk” suggestions on how local governments can take action in their own operations,
- Examples of successful policy adoption and implementation in the St. Louis area or in the Midwest, and
- Relevant resources, including training, funding, etc.

Effective climate action requires **acknowledging the direct link between climate change and issues of social and racial equity and environmental justice.**

Low-income communities and communities of color are disproportionately exposed to – and harmed by – air pollution from industrial and vehicular sources, which are also two of the greatest contributors to climate change. In St. Louis, for example, black children are more than ten times as likely as white children to visit emergency rooms for asthma-related complications (Source: City of St. Louis' **Equity Indicators Baseline Report**). In addition, 52% of low-income households and 46% of black households face “energy burdens” (the percentage of household income spent on utilities) that are more than twice the citywide median, often as a direct result of living in energy-inefficient housing (Source: **Environmental Racism in St. Louis**). Similar statistics can be found for communities across the country.

Adopting policies and actions to advance energy efficiency, renewable energy, and electric vehicles will address many of the air quality issues that cause respiratory, allergy and asthma problems in our communities. Energy efficiency measures will help relieve energy burdens faced by low-income and communities of color. **Climate and equity issues are interrelated; their solutions are, too.**

The City of St. Louis is leading on many of the strategies outlined in this toolkit, thanks to support from programs like the **American Cities Climate Challenge** and the **City Energy Project**. By compiling these resources, we hope to amplify the City's work and the work of other local governments to encourage action for climate protection. From addressing a global pandemic to addressing the challenges of climate change, **we need to work together** to create a healthier, more equitable, more sustainable and more resilient region for all of us who live, work, learn and play here.

# LAYING A FOUNDATION FOR SUCCESS

Want to set a goal to reduce your local government's carbon footprint but don't know where to start? First things first – get yourself organized. Start by making a commitment to action and choose your goal. Will you sign on to **We Are Still In?** Make a Commitment to **100% Clean Energy?** Reduce energy use across your building portfolio by a certain percentage? No matter the goal, the first step is committing to it. Don't just make a commitment to a goal; make a commitment to build your capacity to meet that goal.

**If you don't already have a green team or green practices committee, form one. This is a powerful way to engage citizens, stakeholders and staff in your goal. You might be surprised that there are eager and experienced volunteers in your community that want to help.**

**Don't forget to support your staff – are there trainings they can attend to build knowledge? Or professional certifications they might pursue to support your goals? Professional and non-profit organizations are out there to help.**

Now measure where you are today and use this baseline to keep track of progress towards your goal. Here are a few helpful resource for measuring your carbon footprint, developing greenhouse gas inventories and more:

**ENERGY STAR Portfolio Manager – can be used to track energy, water and waste and will measure GHG emissions.**

**ICLEI Local Governments for Sustainability – ClearPath is among the most widely-used tool for energy & emissions management.**

**Global Protocol for Community-Scale Greenhouse Gas Emission Inventories**

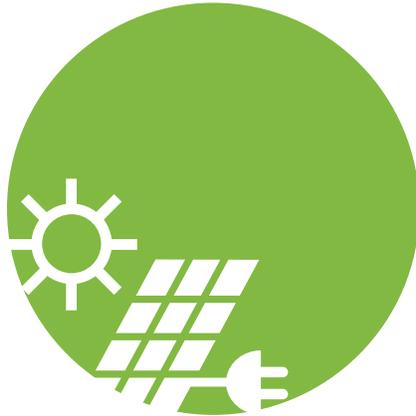
Once you've set your goal and determined your baseline, start making plans to meet your goal and implement those plans. And don't forget to celebrate your success – small and large, it's important to let the community know what has been accomplished.

## TABLE OF CONTENTS



### ENERGY EFFICIENCY IN BUILDINGS p. 5

- Building Energy Code
- Building Energy & Water Use Benchmarking Requirements
- Building Energy Improvement or Performance Policy



### RENEWABLE ENERGY STRATEGIES p.13

- Solar for Municipal Buildings
- Solar-Ready Guidelines or Requirements



### ELECTRIC VEHICLE INFRASTRUCTURE p. 19

- Electric Vehicle-Ready Requirements

### GENERAL RESOURCES p. 22

### THANK YOU p. 22

### CASE STUDIES p. 23





## ENERGY EFFICIENCY IN BUILDINGS

Energy efficiency refers both to energy management in existing buildings and changes in an existing building's systems or new building's design so that the building uses energy more efficiently. According to the US Environmental Protection Agency (Source: **US EPA**), 30% of energy used in buildings is wasted through inefficiency and half of all energy savings are possible through low or no-cost operational improvements. In an April 2019 report, the International Energy Agency indicated that we can cut 87% of greenhouse gas emissions from buildings by pairing energy efficiency with clean electricity technologies which are readily available (Source: **The Critical Role of Buildings**).

Additionally, energy efficiency is one of the most affordable measures for reducing greenhouse gas emissions when compared with measures implemented in other sectors (Source: **World Resources Institute**). All this adds up to represent significant opportunities to reduce greenhouse gas emissions and save money on energy bills by implementing energy efficiency in our buildings - a win-win strategy.

## BUILDING ENERGY CODE

Energy codes are generally embedded within the full building code and specify minimum energy efficiency standards for new residential and commercial construction – focusing mostly on construction methods; the building envelope (insulation, windows and doors); heating ventilation and air conditioning systems (HVAC); lighting; water heating; and overall building performance. The most cost-effective time to address energy efficiency in a building is when a building is first being designed and constructed. Once built, it can be harder and more expensive to go back and retrofit or upgrade a building. Modern building energy codes save building owners and occupants money on utility bills, while also providing healthier spaces by addressing ventilation and indoor air quality.

If a local government is revising or updating a Master Plan, it is also a good time to update building and energy codes. Updated, modern building codes give a local government new footing for the future of the community – economically, socially, and environmentally – while showing leadership at the local level.

Building code at the local level is usually based on the model code developed nationally by International Codes (I-Codes), which is developed through a rigorous governmental consensus process, updated every three years, and then adopted at the local level. The International Energy Conservation Code (IECC) is embedded within the I-Codes and provides provisions for residential and commercial buildings. The State of Illinois has a statewide building code and is currently using the 2018 International Energy Conservation Code. The State of Missouri does not have a statewide building code, but allows local municipalities to adopt and enforce their own code.

## SAMPLE POLICY

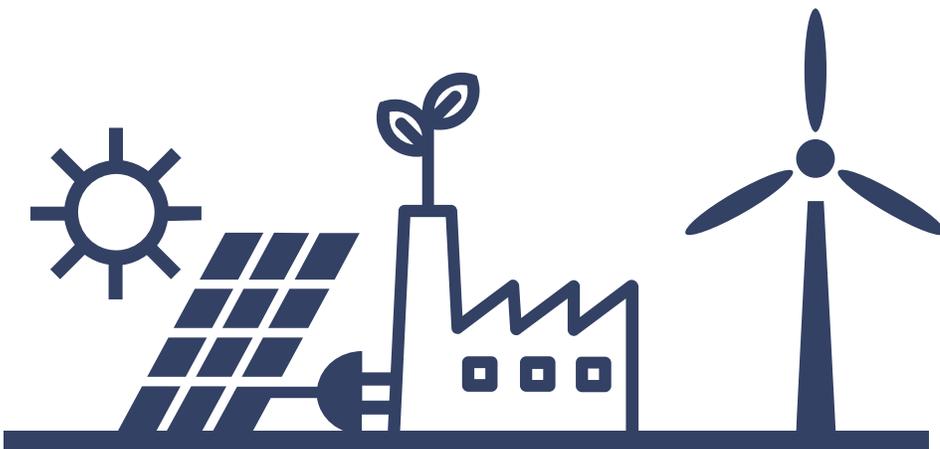
**2018 International Energy Conservation Code** (the next version of IECC is 2021)

**ANSI / ASHRAE / IES Standard 90.1** (Energy Standard for Buildings Except Low-Rise Residential)

**ANSI / AHSRAE / ICC / USGBC / IES International Green Construction Code** (IgCC)

**ZERO Code** is an initiative of Architecture 2030 that incorporates current and cost-effective energy efficiency measures with on-site and/or offsite renewable energy resulting in zero-net-carbon buildings (new commercial, institutional, and mid-to high-rise residential).

**Stretch or Reach Code** is a voluntary addition to a statewide minimum energy code that allows local jurisdictions to adopt a “beyond code” option to achieve greater levels of energy efficiency. Because Missouri doesn’t have a statewide energy code, this strategy would only be applicable in Illinois.



## WALKING THE TALK

### TAKING ACTION IN LOCAL GOVERNMENT OPERATIONS

- City buildings should be compliant with the same local code that private buildings are required to meet.
- The process for code adoption and enforcement should be transparent and encourage public engagement.

## WHERE IS THIS HAPPENING?

- Columbia, Missouri adopted the 2015 IECC in 2016
- City of St. Louis adopted the 2018 IECC with minor amendments in 2018
- Richmond Heights adopted the 2018 IECC as written in 2019
- St. Louis County adopted the 2015 IECC with some amendments in 2019

## RELEVANT RESOURCES

**Ameren Missouri Residential Energy Code Support** is currently providing training and resources on how to comply with local residential energy code and best practices.

The Midwest Energy Efficiency Alliance (MEEA) has a **Building Energy Codes program** and a **Building Energy Codes 101 fact sheet**. They typically host a Building Energy Code conference every fall with stipends available to local government employees.

**St. Louis Procode** – St. Louis Professional Chapter of ICC and AIA St. Louis Building Code Committee

**MABOI** – Missouri Association of Building Officials and Inspectors

**MACE** – Missouri Association of Code Enforcement

**Building Codes Assistance Project** – national organization that tracks code status, provides technical support and training and conducts research and analysis related to energy code.

U.S. Department of Energy **Building Energy Codes Program: National Benefits Assessment**



## BUILDING ENERGY & WATER USE BENCHMARKING REQUIREMENTS

Benchmarking is the process of tracking a building's energy and water use and comparing performance to the building's past performance and to similar buildings. Benchmarking is a building management best practice and the first step towards making energy efficiency improvements in a building because "You Can't Manage What You Don't Measure." Cities around the country – including the City of St. Louis – have implemented benchmarking and transparency policies that require large buildings to report their energy and water use annually using the US EPA's free online tool, ENERGY STAR Portfolio Manager. Benchmarking helps buildings owners and managers understand how their properties compare with similar buildings and can motivate energy efficiency improvements. According to the US EPA, buildings that benchmark can save 7% on average over three years. (Source: [US EPA](#)) Benchmarking policies allow local governments to better understand how buildings in their jurisdiction use energy. Making data publicly available can empower owners and tenants to make changes in how buildings use energy. It can also drive market demand and competition for more energy efficient buildings and tenant spaces.

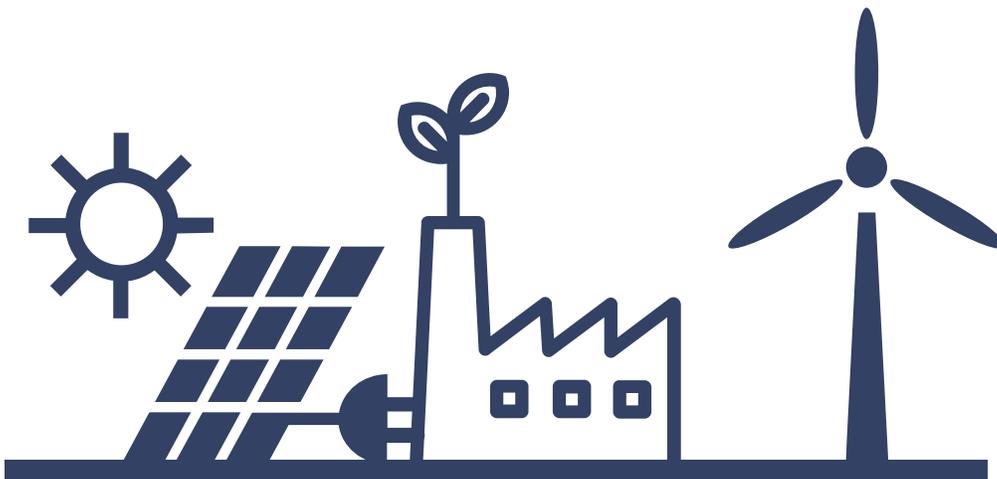
### SAMPLE POLICY

#### A Benchmarking & Transparency Policy should include:

- Type of buildings required to comply (typically municipal, commercial, institutional and multi-family) and what (if any) types of buildings are exempt.
- Square footage threshold of buildings required to comply (10,000 – 50,000 square feet depending on building stock).
- Annual date for compliance and fees or penalties for non-compliance.
- How buildings will comply (ENERGY STAR Portfolio Manager).
- Who is responsible for submitting data and whether third-party data verification is required.
- What data will be made public, as well as how and when it will be shared.

#### Where to find policy examples:

- St. Louis, MO [Building Energy Awareness Ordinance](#) - passed Jan 2017
- Kansas City, MO [Energy Empowerment Ordinance](#) - passed in 2015
- Des Moines, IA [Energy & Water Benchmarking](#) - passed June 2019
- Evanston, IL [Energy & Water Benchmarking Ordinance](#) – passed December 2016
- Edina, MN [Efficient Buildings Benchmarking Ordinance](#) – passed May 2019



# WALKING THE TALK

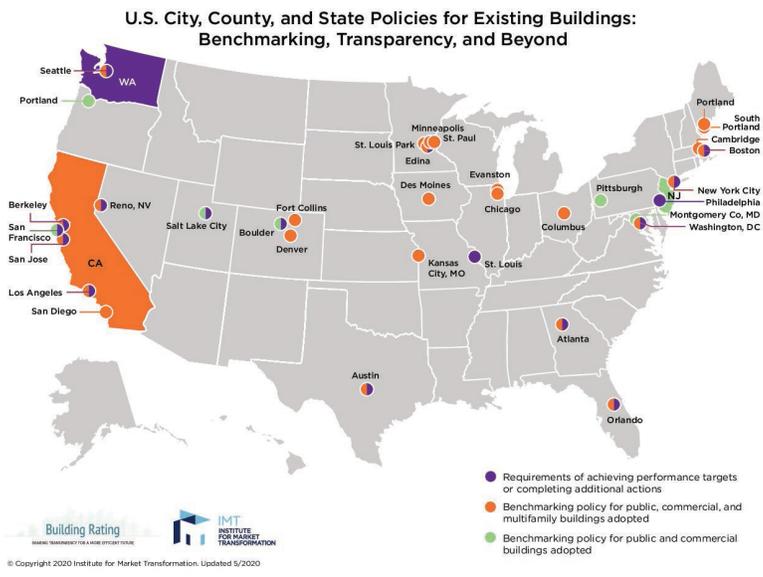
## TAKING ACTION IN LOCAL GOVERNMENT OPERATIONS

When most cities pass legislation requiring the private sector to benchmark and report energy use, they also require municipal buildings to benchmark and make the data available to the public. All the policies linked above require benchmarking and reporting for municipally owned buildings. In their benchmarking process, the City of St. Louis identified three high performing buildings that were eligible for **ENERGY STAR Certification**: City Hall, 1520 Market and the Carnahan Courthouse building. Kansas City's work is highlighted in a report from International City/County Management Association: **Creating a Cost-Effective and Energy Efficient Kansas City with EPA's ENERGY STAR**.

The following municipalities are participating in the local, voluntary **Better Buildings Through Benchmarking campaign** and tracking their energy use in ENERGY STAR Portfolio Manager: Clayton, Creve Coeur, Maplewood, University City and Wildwood.

# WHERE IS THIS HAPPENING?

31 state and local jurisdictions are currently requiring some sort of benchmarking. (Map Source: [IMT](#), Updated 5/2020)



To review a matrix comparing the benchmarking and transparency policies of the cities on the map, visit [BuildingRating.org](https://www.buildingrating.org)



## RELEVANT RESOURCES

### City Energy Project Resource Library

- The City Energy Project partnered with 20 cities and counties across the US (including St. Louis and Kansas City) to create and implement customized, impactful building energy efficiency policies.

[www.stlbenchmarking.com](http://www.stlbenchmarking.com) - City of St. Louis Benchmarking Website includes all the information needed to comply with its Building Energy Awareness Ordinance including forms to request utility data, upcoming trainings, and a **Benchmarking Guide and Reporting Checklist**.

### Kansas City Energy Empowerment Compliance

**Better Buildings Through Benchmarking** – local voluntary benchmarking campaign in the St. Louis region that encourages energy efficiency in buildings starting with benchmarking.

### ENERGY STAR Portfolio Manager Benchmarking Starter Kit

Portfolio Manager is the industry standard benchmarking tool. All the cities requiring energy and water benchmarking reporting use Portfolio Manager. In addition to the starter kit, ENERGY STAR offers a multitude of resources on energy benchmarking and energy efficiency.

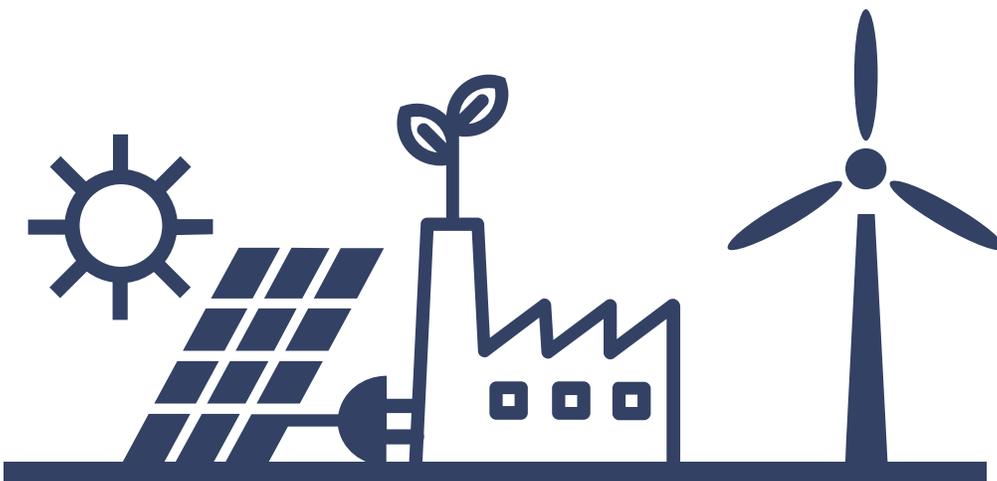
## BUILDING ENERGY IMPROVEMENT OR PERFORMANCE POLICY

Benchmarking and transparency policies are a great tool for raising awareness about energy use in buildings. But to really drive action to reduce energy use and emissions, a companion energy improvement or energy performance policy is required. Building energy improvement and performance policies are where the rubber really meets the road. Several of the 31 local governments with benchmarking policies include provisions in their benchmarking legislation to phase in building energy improvement requirements after a few years. Some cities pass benchmarking and building improvement / performance requirements as separate pieces of legislation. Every local government's approach is a little different depending on the market and the building stock.

Building improvement policies usually include either energy audit or retuning / retrocommissioning requirements:

- Energy Audit – require that building owners conduct whole-building energy assessments on a regular basis (every 5 or 10 years). If buildings do not meet a specific performance level, they are then often required to implement specific suggestions for building updates – depending on the type of building – such as lighting or HVAC updates.
- Retuning or Retrocommissioning – similar to energy audits, retuning or retrocommissioning of a building is required on a regular basis to make sure that building systems and equipment (heating and cooling, water heating, lighting, renewable energy systems, building automation systems, etc.) are maintained and operating as designed. If systems are under-performing, building owners must make improvements.

Building Energy Performance Standards require buildings to meet a minimum level of energy performance by a specific date. Performance standards give building owners more flexibility in improving their building than improvement policies. Standards are typically set using local data for different building types and are meant to be updated with increasingly stringent targets periodically.



## SAMPLE POLICY

Like benchmarking policies, building improvement and performance policies must outline what type and size of buildings must comply, by when, and how.

### Improvement policies must determine:

- Whether they will require an audit or retrocommissioning.
- If they will allow performance exemptions (green building certification, minimum Energy Use Intensity (EUI), ENERGY STAR Score).
- How buildings will document and prove compliance.

### Performance policies must determine:

- What performance metric to use – ENERGY STAR Score, EUI, Greenhouse Gas Emissions, etc.
- What the minimum performance standard will be for each building type and what data that will be based on (local, national).

### Both types of policies must determine:

- Compliance Cycles – when buildings must initially comply and then how many years before they have to comply again.
- Prescriptive and/or Performance Compliance Pathway if building isn't performing at minimum levels required. A prescriptive path would include specific energy conservation measures to implement. A performance path would require a percentage improvement beyond current level of performance.
- What makes a building eligible for an exemption or deadline extension (e.g. low occupancy, financial distress, pending demolition, etc.).
- Data verification requirements.
- Penalties for non-compliant buildings.
- How to provide support to building owners that need assistance complying with the policy in order to ensure successful policy implementation, such as budgeting for staff and/or resources.

### Where to find policy examples:

- St. Louis, MO [\*\*Building Energy Performance Standard\*\*](#) – passed April 2020 and requires that buildings 50,000 square feet and greater meet an energy performance standard no lower than the 65th percentile of site EUI of similar local buildings by 2025.
- Boulder, CO [\*\*Boulder Building Performance Ordinance\*\*](#) was passed in 2015 and requires lighting upgrades as well as audits and retrocommissioning every ten years.
- Atlanta, GA [\*\*Commercial Building Energy Efficiency Ordinance\*\*](#) requires audits every 10 years – passed in 2015 along with benchmarking requirements.
- Reno, NV [\*\*Energy & Water Efficiency Program\*\*](#) requires buildings to meet a performance target or perform an audit or retrocommissioning every 7 years.



## WALKING THE TALK

### TAKING ACTION IN LOCAL GOVERNMENT OPERATIONS

Similar to benchmarking, when most cities pass legislation requiring the private sector to improve their buildings, they also require municipal buildings to meet the same or similar requirements. If a local government doesn't already have an energy committee or green team, one should be formed, especially if there isn't an energy department or a full-time energy manager. Benchmarking data can be used to inform and prioritize the highest impact efficiency projects.

## WHERE IS THIS HAPPENING?

The City of St. Louis passed a Building Energy Performance Standard in April 2020, which makes it the fourth jurisdiction to have such a policy in place. In addition to St. Louis, Washington DC, New York City and the State of Washington have established Building Energy Performance Standards. Many other cities have building improvement policies in place, including Atlanta, GA; Austin, TX; Berkeley, CA; Boston, MA; Boulder, CO; Los Angeles, CA; Orlando, FL; Reno, NV; San Francisco, CA and San Jose, CA. Visit [BuildingRating.org](http://BuildingRating.org) for their [Commercial Building Policy Comparison](#).



## RELEVANT RESOURCES

Institute for Market Transformation Collection of Resources  
[Exploring Building Energy Performance Standards](#)

### [City Energy Project Resource Library](#)

- [Decision Framework for Creating High Impact Performance Policy](#)

Utility Energy Efficiency Incentives:

- [Ameren Missouri](#)
- [Ameren Illinois](#)
- [Spire](#)

Property Assessed Clean Energy (PACE) – financing for energy efficiency and renewable energy projects that allows owner to pay back the upfront investment annually on property taxes

- [Set the PACE St. Louis](#) (City of St. Louis)
- [Missouri Energy Savings Program](#) (St. Louis County)
- [Show Me PACE](#)
- [Missouri Clean Energy District](#)
- [Illinois Finance Authority](#) (Commercial PACE)

State Resources & Support

- [Missouri Division Energy Loan Program](#) – provides low interest loans for energy efficiency projects to local governments, K-12, higher education, hospitals, local governments
- Illinois Clean Energy Foundation [Net Zero Energy Building Program](#) provides grants to local governments, non-profits, and higher education to pursue net zero buildings.

[Federal Energy Efficiency Tax Deductions](#) (available through December 2020)

[National Association of Energy Service Companies](#) is a membership organization for Energy Service Companies that provide cost-effective energy efficiency retrofits using a performance-based contract business model.

Training Opportunities for Building Managers and Operators

- [Building Operator Certification](#), hosted locally by Midwest Energy Efficiency Alliance
- [Green Professional Building Skills \(GPRO\) Operations & Maintenance](#), hosted locally by USGBC-Missouri Gateway Chapter
- Additional opportunities available through local chapters of professional organizations, such as ASHRAE, AIA, BOMA, IFMA, USGBC and others.



## RENEWABLE ENERGY STRATEGIES

When most people think of addressing climate change, they think of renewable energy – and for good reasons. Renewable energy does not require combustion to produce the power we need, it does not generate harmful air pollution or carbon emissions, and it is often the least expensive new resource. Renewable energy production is growing faster than ever. According to the International Renewable Energy Association, over one-third of the world’s electricity comes from renewable sources. (Source: **IRENA Renewable capacity highlights**). We are also building less fossil fuel infrastructure than ever before. Consumers – from large corporations to local governments to homeowners and apartment dwellers – are demanding clean energy from their utilities. This is good news, but we need to increase renewable energy production to meet aggressive climate goals and reduce impacts of climate change. While we need utilities and others to invest more in clean energy, we also need to address the barriers to installing clean energy at the individual building level. Since the most accessible clean energy to most of us is solar, that’s what this section will focus on.

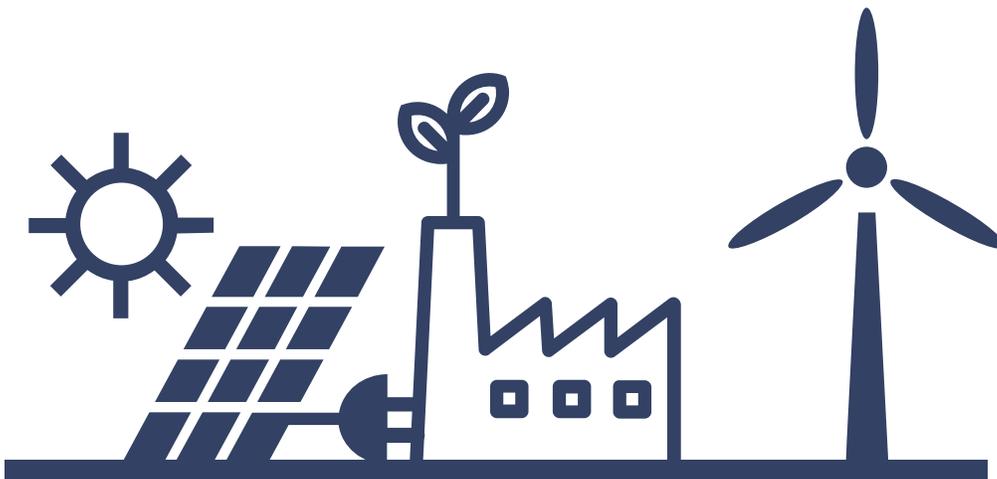
## SOLAR FOR MUNICIPAL OPERATIONS

Local governments and municipalities are already adapting to climate change, due to hotter summers, increased flooding, and more. By setting renewable electricity goals, local governments can also play a role in mitigating climate change. Installing solar on municipal buildings or property can help create local jobs, reduce air pollution, and reduce energy bills. While the cost to install solar photovoltaic (PV) panels has dropped more than 50% since 2014 (Source: [US Department of Energy](#)), financing solar installations can still be a challenge, particularly for municipalities with ever tightening budgets and declining revenues. Group solar purchasing programs, like the recently launched Renew STL Solar program, can reduce the upfront cost of installing solar, help municipalities track their carbon savings, and offer awards and public celebration opportunities. In the St. Louis area, companion residential programs are also in place: Grow Solar STL and Grow Solar Metro East.

Meeting a renewable electricity goal – especially if that goal is 100% – will likely require more than installing solar panels. Options for purchasing solar power include utility green tariff programs, community solar programs, renewable energy credits, and power purchase agreements for offsite renewable energy projects, which can be physical purchase power agreements (PPAs) or virtual purchase power agreements (VPPAs).

## SAMPLE POLICY

- [Atlanta, GA](#) Resolution Adopting a Vision of 100% Clean Energy by 2035 - passed May 2017
- [Kansas City, MO](#) Resolution to procure carbon-free energy – passed December 2018
- [Louisville, KY](#) Resolution committing to 100% clean energy for municipal operations by 2030 and city-wide operations by 2035 – passed February 2020
- [City of St. Louis Resolution 124](#) committing to 100% clean electricity by 2035 – passed September 2017



## WALKING THE TALK

### TAKING ACTION IN LOCAL GOVERNMENT OPERATIONS

Procuring municipal electricity from clean, renewable energy embodies walking the talk. Take it a step further by:

- Increasing green jobs and encouraging workforce development related to solar installation – or partner with a local workforce development organization.
- Promoting community solar and group buy programs in the private sector. Local residential group buy programs, Grow Solar St. Louis and Grow Solar, seek municipal partners to help spread the word.

## WHERE IS THIS HAPPENING?

- Cities all over the country have made commitments to clean energy through the **Sierra Club’s Ready for 100 Campaign**.
- Many cities in the region have promoted and hosted solar hours for Grow Solar Metro East and Grow Solar St. Louis.
- Edwardsville, IL; Maplewood, MO; Clayton, MO; and Creve Coeur, MO are a few cities that have installed solar panels on their buildings.
- Clayton, MO; Edwardsville, IL; St. Louis, MO; St. Peters, MO; and University City, MO have all signed onto **Mayors for Solar Energy**.

## RELEVANT RESOURCES

### City of St. Louis Pathways to 100%

Community Solar

- **Ameren Missouri**
- **Ameren Illinois**

Local Solar “Group Buy” Programs that reduce cost of installation

- **Grow Solar Metro East** - residential
- **Grow Solar St. Louis** - residential
- **Renew STL Solar** – commercial & institutional

### US EPA Goal-Setting Guidance for Renewable Electricity Goal

#### Solar Foundation

Solar Power Purchase Agreements:

- **What Is A Solar Power Purchase Agreement?** (Solar Energy Industries Association)
- **Introduction to the Virtual Power Purchase Agreement** (Rocky Mountain Institute)
- **Solar Power Purchase Agreement Toolkit for Local Governments** (Interstate Renewable Energy Council)

Financing Solar Installations:

- **Guide to Federal Investment Tax Credit for Commercial Solar PV** (US DOE)
- Property Assessed Clean Energy (PACE) – financing for energy efficiency and renewable energy projects that allows owner to pay back the upfront investment annually on property taxes
  - **Set the PACE St. Louis** (City of St. Louis)
  - **Missouri Energy Savings Program** (St. Louis County)
  - **Show Me PACE**
  - **Missouri Clean Energy District**



## SOLAR-READY REQUIREMENTS

As with energy efficiency measures, the most cost-effective time to install solar is at the time of new construction. A building should be designed with solar in mind. Is the building oriented properly and the roof angled in the correct way to take advantage of sunlight? Can the building and roof accommodate the weight of a solar installation? Do HVAC equipment or other structures block sun from reaching solar panels that could be avoided with a different design? Is there conduit and wiring from the electric panel (usually on the ground level of a building) to the roof?

The National Renewable Energy Lab (NREL) defines a Solar-Ready Building as being designed and built “with continuous roof space uninterrupted by roof equipment, minimal roof shading throughout the year, and a roof oriented on an east-west horizontal axis.”

If a building is solar-ready, a single-family home could save up to \$4,000 on solar installation costs (Source: [NREL](#)) and a commercial building could save up to \$25,000 (Source: [Solar Cities Minneapolis & St. Paul](#)). That's not small change. While the SolSmart designation (see box on the following page) removes permitting, zoning and other barriers to installing solar, a solar-ready requirement makes it easier for buildings to accommodate solar installation in the future if it's not installed at the time of new construction.

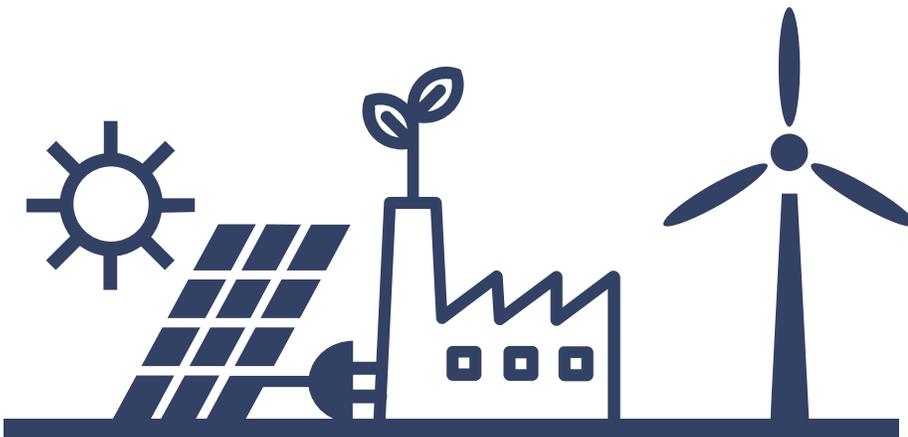
## SAMPLE POLICY

Policies can apply to both commercial and residential new construction and will differ depending on a local government's priorities and building stock but should include provisions for:

- Minimal rooftop shading or otherwise unobstructed roof area.
- Continuous roof space for future PV panels.
- Electrical conduit and conductor routing to rooftop from electric panel.
- Sizing of the electrical panel to accommodate a solar system in the future.
- Roof is adequate to support future PV panel load.

### Where to find policy examples:

- [City of St. Louis Solar-Ready Legislation](#) – passed December 2019
- [2018 International Energy Conservation Code Solar-Ready Appendix](#)



## WALKING THE TALK

### TAKING ACTION IN LOCAL GOVERNMENT OPERATIONS

- If you build any new municipal buildings or make significant renovations to a structure, make them solar-ready – and consider installing solar.

## WHERE IS THIS HAPPENING?

- City of St. Louis [Solar-Ready Infographic](#)
- [Gladstone, MO](#) – a northern suburb of Kansas City passed solar-ready requirements using 2015 International Energy Conservation Code in September 2015. They also have Gold SolSmart designation.
- [Habitat for Humanity St. Louis](#) has been participating in the US Department of Energy [Zero Energy Ready Home National Program](#) since 2017. Zero Ready Homes must follow this [PV-Ready Checklist](#).

## RELEVANT RESOURCES

[Solar Ready Building Design Guidelines](#) from the Minneapolis St. Paul Solar Cities Program

Local Solar “Group Buy” Programs that reduce cost of installation

- [Grow Solar Metro East](#) - residential
- [Grow Solar St. Louis](#) - residential
- [Renew STL Solar](#) – commercial & institutional

Financing Solar Installations:

- [Homeowner’s Guide to Federal Tax Credit for Solar PV](#) (US DOE)
- [Guide to Federal Investment Tax Credit for Commercial Solar PV](#) (US DOE)
- Property Assessed Clean Energy (PACE) – financing for energy efficiency and renewable energy projects that allows owner to pay back the upfront investment annually on property taxes
  - [Set the PACE St. Louis](#) (City of St. Louis)
  - [Missouri Energy Savings Program](#) (St. Louis County)
  - [Show Me PACE](#)
  - [Missouri Clean Energy District](#)
  - [Illinois Finance Authority](#) (Commercial PACE)

## SOLSMART DESIGNATION

SolSmart is a national program that recognizes local governments and regional organizations for removing barriers and making it easier to go solar. Entities seeking SolSmart can achieve Gold, Silver or Bronze designation according to the strategies they pursue and achieve. Over 350 local governments have the SolSmart designation, which is led by the International City/County Management Association and the Solar Foundation and funded by the US Department of Energy Solar Energy Technologies Office. SolSmart helps local governments streamline processes related to solar installation by addressing unnecessary paperwork and red tape that may discourage solar installation – and discourage solar companies from moving to or doing business in an area. Technical assistance is provided by SolSmart partners at no-cost.

Similar to other certification and designation programs, SolSmart requires a variety of actions that local communities can choose from to achieve a designation. Actions include developing a Solar Statement outlining solar goals and tracking metrics, reviewing zoning that may restrict solar development, streamlining permitting and inspection processes and providing training for staff. To learn more, visit [www.solsmart.org](http://www.solsmart.org). Resources on the SolSmart website include: [SolSmart Toolkit for Local Governments](#), [Simplified Solar Permitting Guide](#), and the [SolSmart Program Guide](#).

Many municipalities in Missouri have achieved SolSmart designation including Columbia, Gladstone, Kansas City, Lee’s Summit, North Kansas City, and Independence. St. Louis, MO is currently pursuing a designation with the help of Washington University students. Check out the full listing of designees [here](#).





## ELECTRIC VEHICLE INFRASTRUCTURE

The way we get around has a big impact - transportation accounts for nearly 30% of our greenhouse gas emissions (Source: **US EPA**). Moreover, two-thirds of the petroleum used in the United States is used by transportation. (Source: **US DOE**). Electric Vehicles help to diversify fuel use in transportation, which in turn, reduces our reliance on petroleum, reduces emissions, and saves money. Electric Vehicles eliminate the direct tailpipe emissions that are associated with gas-powered vehicles, which are the emissions that contribute to both climate change and the formation of ground-level ozone. In the St. Louis region, we consistently struggle with high ozone levels – especially in the summer – which are harmful to human health and especially harmful for those with asthma and other lung conditions. While most of the electricity used to power Electric Vehicles is produced at power plants, as we transition those power plants from fossil fuels to clean renewable energy, there is the opportunity for even greater emissions reductions. And the best case scenario? Electric Vehicle charging stations powered by wind or solar.

Making the case for Electric Vehicles (EVs) is one thing, but providing the infrastructure for charging is also critically important. Consumer demand for EVs is growing, but greater investment in EV charging infrastructure is required to meet this demand. Most major US cities have only about one-quarter of the workplace and public EV chargers in place that will be needed by 2025. More specifically, St. Louis had less than 50% of the needed charging infrastructure installed by the end of 2017 (Source: **International Council on Clean Transportation**).

## ELECTRIC VEHICLE-READY REQUIREMENTS

Local governments can accelerate the use of electric vehicles by putting EV charging infrastructure requirements in place. As with solar installation, including EV charging infrastructure at the time of new construction or major renovation is the most cost-effective way to accelerate this climate protection strategy. According to a [case study](#) prepared for the City and County of San Francisco, the cost savings of adding EV charging at the time of construction are significant. Adding 2 charging stations to a parking lot with 10 spaces at the time of construction would cost \$920 per charger. If added as a retrofit, it would cost \$3,710 per charger. EV-Ready Requirements can vary from making the site EV ready with conduit and designated space for future infrastructure to installing the full charging infrastructure at the time of construction.

## SAMPLE POLICY

### There are several levels of EV-Ready requirements:

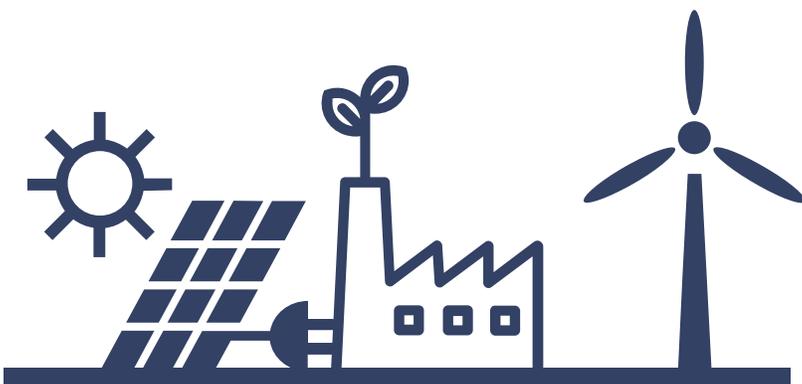
- EV-Capable: install electrical panel capacity with dedicated branch circuit and continuous raceway from the panel to the future EV parking spot.
- EVSE (Electric Vehicle Supply Equipment)-Ready Outlet: Install electrical panel capacity and raceway with conduit to end in a junction box or 240-volt charging outlet.
- EVSE-Installed: Install a minimum number of Level 2 EV charging stations (240-volt).
  - Source: [Southwest Energy Efficiency Project](#)

### In addition to determining the level of EV-readiness to require, a policy should also designate:

- what triggers implementation (new construction and/or major renovation),
- what types of construction projects must comply (commercial & institutional, multi-family, single-family, parking lots, parking garages, etc.), and
- what percentage of parking spaces should be served by charging stations?

### Where to find policy examples:

- [Atlanta, GA](#) – EV-Capable for new 1- or 2-family and multi-family dwellings (new construction).
- [Boulder, CO](#) – EV-Ready for 10% of spaces & EV-installed for 2 spaces in multi-family and commercial new construction.
- [Chicago, IL](#) – EV-Ready for new construction of residential (5 or more units) and commercial (with 30 or more parking spaces).
- [Salt Lake City, UT](#) – EV-Installed for 1/25 spaces at multi-family new construction.
- [International Code Council](#) approved the addition of EV-Capable Requirements for new home construction in the 2021 code, which will be available in October 2020.
- [LEED Green Building Rating System Credit for Electric Vehicles](#)



## WALKING THE TALK

### TAKING ACTION IN LOCAL GOVERNMENT OPERATIONS

- Add EV charging in municipally owned parking lots.
- Consider procuring electric vehicles when it's time to replace fleet vehicles.

## WHERE IS THIS HAPPENING?

In addition to the cities listed above, many local buildings and campuses have EV charging, including many local hotels, Alton City Hall, Commerce Bank, Metro Lighting (Brentwood), Missouri Botanical Garden, St. Louis Lambert International Airport, Southern Illinois University-Edwardsville, St. Louis Community College-Wildwood, and Washington University in St. Louis. Recently, the local transit authority, Bi-State, won \$2.3 million dollars in funding from the Federal Transit Authority for Battery Electric Vehicle buses and charging stations.

The City of St. Louis and St. Louis County are also exploring EV-Ready requirements to make electric vehicles more practical and accessible to their residents. The City is working with the North Newstead Association and other partners on a pilot project to provide equitable access to Electric Vehicles and charging to at-risk residents, like seniors, in areas outside of the central corridor.

## RELEVANT RESOURCES

**Ameren Missouri** recently began offering incentives for businesses to install EV charging stations at workplaces, multi-family apartment buildings and other publicly accessible locations.

US Department of Energy [Electric Vehicle Resources](#)

**Forth** – a national non-profit advancing electric, smart and shared transportation



## ENCOURAGING VOLUNTARY ACTION IN THE PRIVATE SECTOR



In addition to advancing code and policy to accelerate energy efficiency and renewable energy investments, local governments can encourage voluntary actions in the private sector. Some of the most impactful action is voluntary – hundreds of building owners in the St. Louis area have chosen to pursue **LEED Green Building Certification** on a voluntary basis. Others are participating in the voluntary benchmarking campaign, **Better Buildings Through Benchmarking**. And many more are implementing green practices through participation in **OneSTL** and the **St. Louis Green Business & Green Cities Challenge**. Creve Coeur recently launched their own **Green Business Program** to educate, train and encourage businesses in recycling and waste reduction practices. Local governments are also participating in **Grow Solar St. Louis** and **Grow Solar Metro East**, encouraging homeowners to participate in the group buy program that lowers the cost of installing solar. All our actions make a difference and add up to make an impact on our community and our environment.

### GENERAL RESOURCES

- [\*\*American Cities Climate Challenge Climate Action Playbook Brief\*\*](#)
- [\*\*Better Buildings Through Benchmarking\*\*](#)
- [\*\*City Energy Project Resource Library\*\*](#)
- [\*\*City of St. Louis Sustainability Page\*\*](#)
- [\*\*Midwest Energy Efficiency Alliance\*\*](#)
- [\*\*OneSTL\*\*](#)
- [\*\*Renew Missouri\*\*](#)
- [\*\*St. Louis Regional Green Business / Green Cities Challenge\*\*](#)
- [\*\*Urban Sustainability Directors Network\*\*](#)
- [\*\*US Green Building Council – Missouri Gateway Chapter\*\*](#)
- [\*\*Washington University in St. Louis Sustainability\*\*](#)

### THANK YOU

Thank you to Washington University in St. Louis and Bloomberg Philanthropies for supporting the creation of this toolkit. Special thanks to Phil Valko and Claire Santoro from Washington University for their detailed review of the document. And thank you to fellow members of the OneSTL Energy & Emissions working group for your feedback: Catherine Werner, Rajiv Ravulapati and Maurice Muia with the City of St. Louis; Aaron Young with East-West Gateway Council of Governments; Richard Reilly with the Missouri Botanical Garden's EarthWays Center, and Andrew Linhares with Renew Missouri.

Gratitude to the City of St. Louis – elected officials and staff – for their leadership in our region on climate awareness and climate protection and their dedication to making a difference.