ENERGY

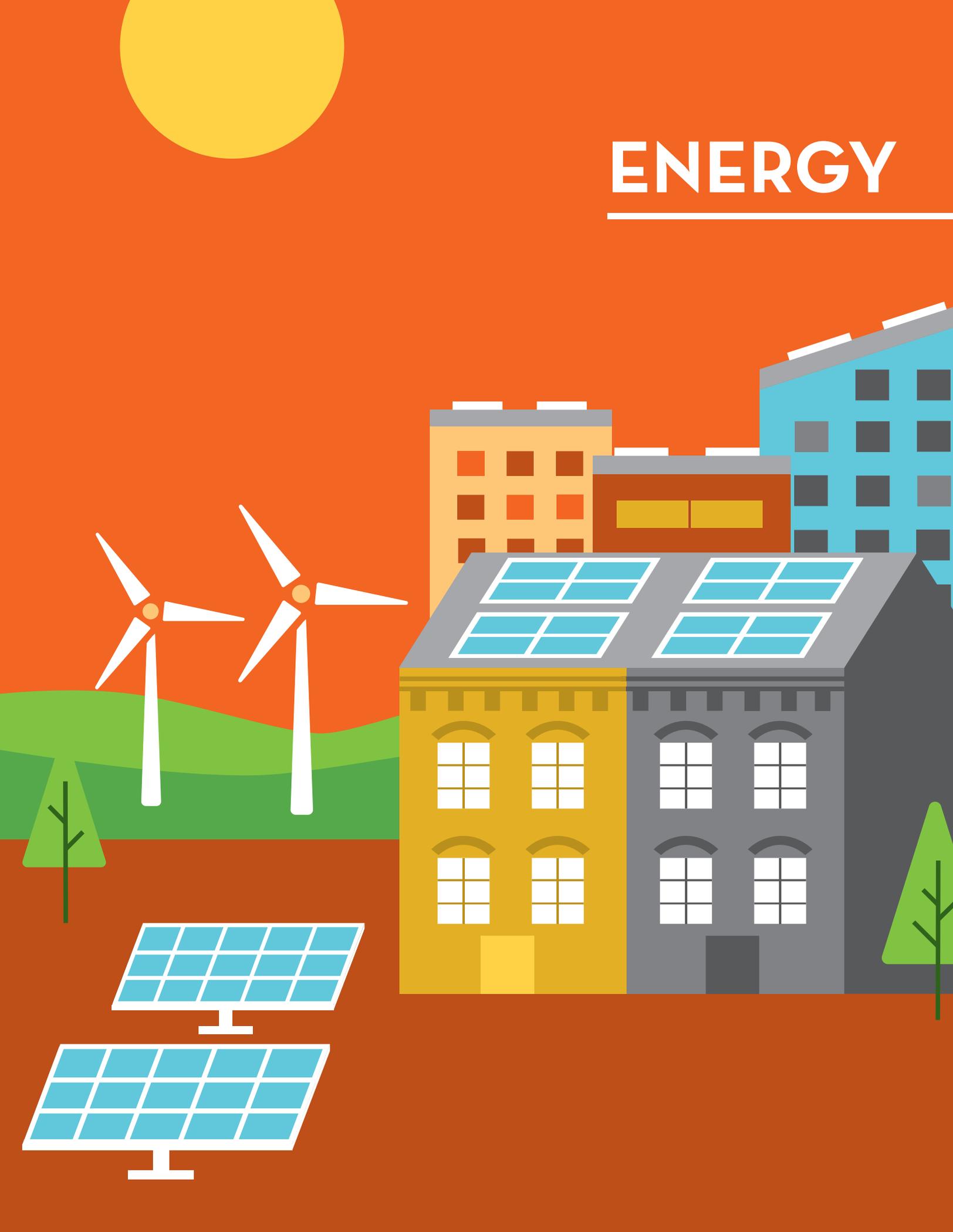# ⚡ ENERGY

Energy literally powers our city—it lights our buildings, heats and cools our homes, and fuels our motorized vehicles. However, generating energy from fossil fuels releases greenhouse gases (GHGs) that cause climate change. In fact, 96 percent of the emissions in the District come from using energy, and 75 percent of those emissions come just from the energy used to heat, cool, and power buildings.[30] Energy generation from fossil fuels also has an impact on regional air quality. Some of the biggest challenges for the District are determining how to reduce costs, reduce energy use overall, and shift the power supply to renewable sources such as solar and wind—all while the District's population and economy continue to grow.

The District Government's approach to address this challenge is detailed in the District's energy and climate action plan, Clean Energy DC, with which the energy section of Sustainable DC is closely aligned. Clean Energy DC is the roadmap for meeting Washington, DC's climate change goals by increasing clean energy and reducing dirty energy—meaning the District Government will help businesses, residents, and city operations improve energy efficiency and increase their access to renewable energy. Clean energy is energy generated with no pollution or carbon emissions in contrast to dirty fuels (like coal and most oil). Washington, DC already has some significant tools: the DC Sustainable Energy Utility was created to help residents and businesses use less energy and save money, while Property Assessed Clean Energy (PACE) financing and the newly established Green Bank provide innovative financing for energy efficiency and clean energy upgrades.

Sustainable DC 2.0's actions for energy have real benefits for Washington, DC at all levels:

INDIVIDUAL

Actions in Sustainable DC 2.0's Energy section apply to residents where they live and work. These actions will make it easier for people to access energy efficiency upgrades and renewable energy financing for home systems. Sustainable DC 2.0 also aims to end power outages by building resilience into our energy system.

NEIGHBORHOOD

Energy systems that work at the neighborhood level take advantage of a larger scale—entire neighborhoods can band together to install and use solar power, for example. Sustainable DC 2.0 outlines actions to incentivize energy actions at this level.

DISTRICT

Actions in Sustainable DC 2.0 will have an impact on buildings, lighting, and access to renewable power District-wide, and also incentivize improvements to the District's electrical grid. The Mayor's office, as well as numerous government agencies including the Department of Transportation and the Department of General Services, will look to this plan when they set their energy priorities each fiscal year.
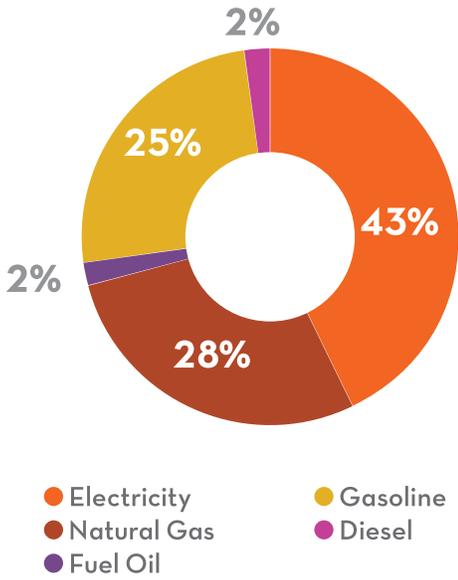
EXISTING BUILDING PERFORMANCE

Benchmarking is defined as tracking a building's energy and water use and using a standard metric to compare the building's performance against past performance and to its peers nationwide.

0   1   2   4 Miles

N

1
2
3
4
5
6
7
8

• Energy-Benchmarked Buildings
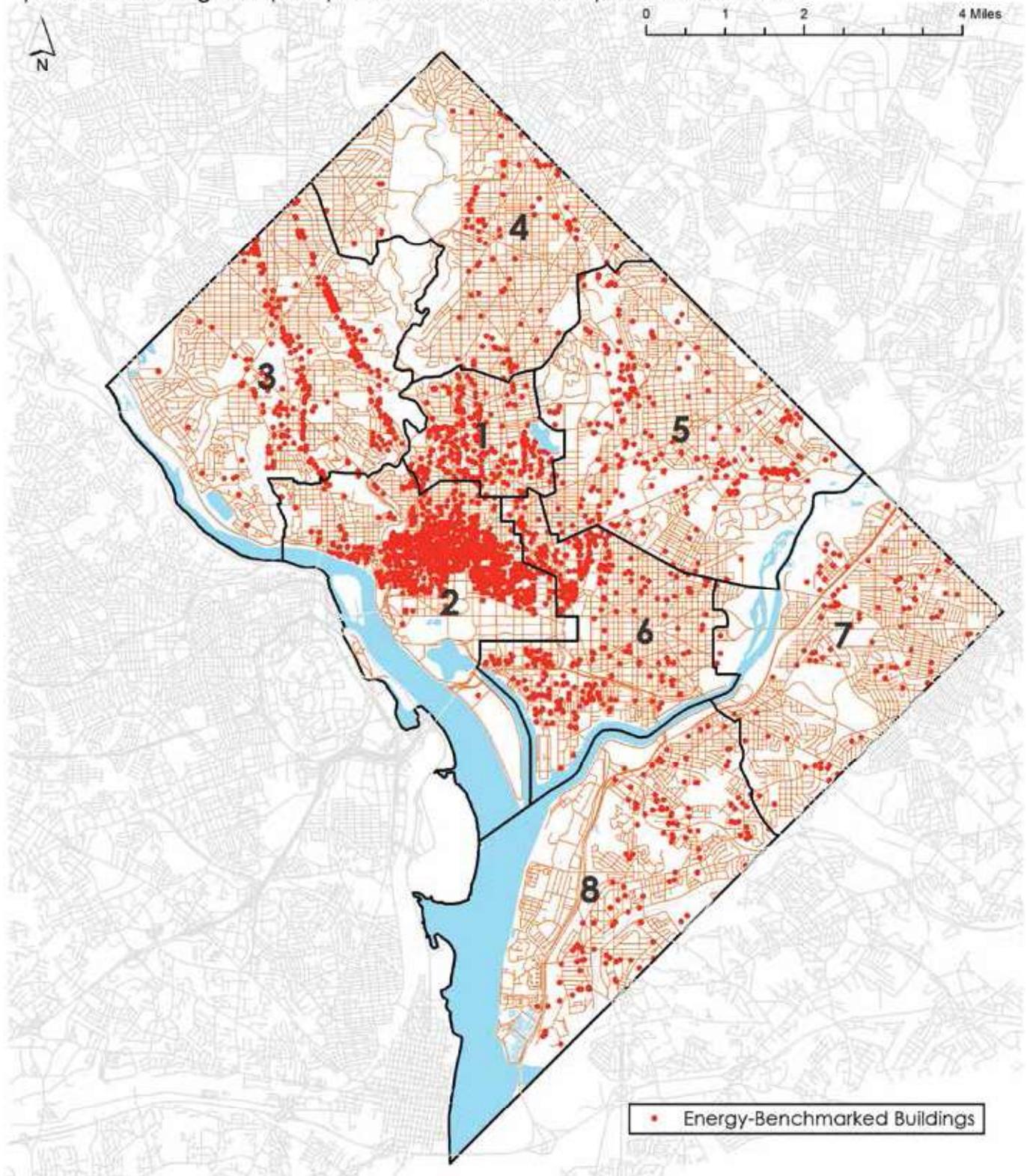
Data Source: DOEE & DC GIS

Source of Energy by Fuel Type (2012)[xxxiv]

- 2%
- 25%
- 2%
- 43%
- 28%

- ● Electricity
- ● Natural Gas
- ● Fuel Oil
- ● Gasoline
- ● Diesel

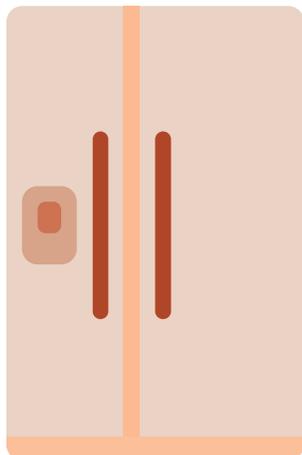## An LED light uses 75% less energy than a regular light bulb.[xxxv]

Number of DC households served through Low Income Home Energy Assistance (LIHEAP) Program[xxxvi]
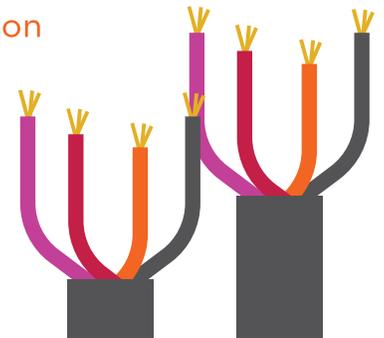
2016—**22,322**
2017—**20,696**
2018—**20,270**

1 kWh is enough energy to power an efficient refrigerator for one day.[xxxvii]

About **2** to **6%** of electricity is lost through transmission from its original source.[xxxviii]

GOAL 1

Improve the efficiency of District-wide energy use to reduce overall consumption.

TARGET 1

By 2032, cut per capita energy use District-wide by 50%.

TARGET 1 BASELINE

29.96 %

EN1.1

Expand regular tracking and disclosure of energy performance.

Buildings consume more than half of all energy in the District through heating, cooling and electricity use.[31] The first step to managing energy use is to measure it. Energy benchmarking refers to programs that require building owners to track and disclose their energy use. The District Government was one of the first cities in the nation to require the annual tracking and disclosure of energy use for large buildings through its energy benchmarking program. Other cities now require smaller buildings to disclose their energy use at key points such as time of sale. The District will expand its existing program to include additional buildings through a variety of mechanisms and to continue sharing this data through tools such as **www.buildsmartdc.com**.

TIMEFRAME	LEAD	PARTNER
Short term	DOEE	DGS

EN1.2

Establish a Building Energy Performance Standard for existing large buildings.

A Building Energy Performance Standard (BEPS) would establish regular energy check-ups of buildings and require the owners of poorly performing buildings to improve the energy efficiency of their buildings. The District Government will develop and implement a BEPS, as described in the Clean Energy DC, for existing large buildings. BEPS will substantially reduce GHG emissions since energy consumed by buildings is the leading source of greenhouse gases in the District.

TIMEFRAME	LEAD	PARTNER
Short term	DOEE	DCRA

EN1.3

Replace all street and public lighting with high efficiency fixtures that protect public health, reduce light pollution, and do not harm wildlife.

Adequate public lighting (such as street and traffic lights) is critical to public safety, and the District Government is already replacing streetlights with more efficient light-emitting diode (LED) versions. While LED lights generally use 75 percent less energy and can last more than 25 times longer than incandescent bulbs,[32] some forms of LED lighting emits a blue-white light that can disrupt animal and human circadian rhythms.[33] When replacing street and public lighting in the future, the District Government will follow the American Medical Association's recommendations to use lights with a color temperature no greater than 3,000 Kelvin, as well as ensure that light fixtures direct light downwards where it is needed, rather than into trees and windows where it may disrupt feathered and human residents.

TIMEFRAME	LEAD	PARTNERS
Short term	DDOT	DCPS, DPR, DGS

EN1.4

Fully fund, implement, and regularly update the Clean Energy DC plan, the plan to achieve the District's greenhouse gas reduction goals.

Clean Energy DC is the District's plan to reduce GHGs 50 percent below 2006 levels by 2032, by reducing energy consumption and increasing renewable energy within the District. The plan describes in detail 57 actions that will allow the city to meet its overall climate and energy goals. In order to fulfill the goals of Clean Energy DC, the District Government will fully fund, implement, and periodically revisit Clean Energy DC to ensure that periodic targets are being met and the latest data and technology are considered. To accomplish the public building improvement aspects of the plan, District Government will provide adequate funding to the Department of General Services.

TIMEFRAME	LEAD	PARTNERS
Medium term	DOEE	DGS, EOM

EN1.5

By 2020, launch a citywide educational and behavioral campaign to lower citywide energy use and expand awareness of the District's resources for efficiency and renewable energy.

One of the quickest and most cost-effective ways to lower citywide energy use is for individuals and businesses to lower their energy consumption. However, many residents aren't aware that there are opportunities and financial incentives offered by the District Government to help them save on their energy costs. The District Government will launch a campaign to help residents and businesses take advantage of these resources, from reminders about ways individuals and businesses can save energy, to home audits and weatherization.

TIMEFRAME	LEAD	PARTNERS
Short term	DOEE	DCHA, EOM

EN1.6

Launch a program to accelerate deep energy retrofits in at least 20 percent of all buildings.

A deep energy retrofit analyzes an entire building in order to identify and upgrade areas where investments in energy efficiency can have the biggest impact. The process can help building owners save on energy costs over time, but upfront costs make it more difficult for building owners to invest in energy efficiency. The District Government will develop and launch a program providing financial incentives to help all building owners, including residential and commercial, embark on deep energy retrofits that will make buildings less expensive to operate and cut GHGs. The 20 percent of all buildings will be determined by floor area.

TIMEFRAME	LEAD	PARTNERS
Short term	DOEE	DCHA, DGS

GOAL 2

Increase the proportion of energy sourced from both clean and renewable supplies.

TARGET 2

By 2032, increase renewable energy to make up 50% of the District's energy supply.

TARGET 2 BASELINE

1.6% (2015)

EN2.1

Reduce the use of fossil fuels for electricity generation and heating, and eliminate the dirtiest fuels by 2023.

Burning coal, gas, and oil for electricity and heating can negatively impact air quality, and emits the greenhouse gases that cause climate change. Through the Renewable Portfolio Standard (RPS) and other policy tools and incentives, the District Government will collaborate with residents and the private sector to decarbonize their energy supply, including heating systems, and will work to completely eliminate the most polluting fuels—coal and the dirtiest fuel oils—by 2023. Ways to accomplish this action include, but are not limited to, using power purchase agreements (PPAs) to buy electricity with bundled Renewable Energy Credits (RECs) from renewable sources, electrifying heating systems in buildings by using efficient heat pump technologies, using battery storage or low carbon Combined Heat and Power, and using carbon-neutral biomass or biogas.

TIMEFRAME	LEAD	PARTNER
Medium term	DOEE	OPC

EN2.2

Build and support commercial and residential renewable energy projects sufficient to get at least five percent of citywide electricity from local generation.

Locally generated electricity from renewable sources has many benefits for the District: it helps reduce greenhouse gas emissions, reduces regional air pollution, diversifies the local energy supply, lowers energy bills, and can even help create jobs in renewable energy installation. The District Government will oversee and support both commercial and residential renewable energy projects, including the option to share a solar project among several neighbors ("community solar"). The District Government will also use financial incentives, research and education, and maximize existing programs to help install solar panels and solar thermal systems throughout the District. For example, the program Solar for All provides solar energy to households of low income, helping to reduce their energy bills by 50 percent. Additionally, the District's Renewable Portfolio Standard requires that 5 percent of all the renewable energy supplied to the District by 2032 come from locally generated solar.

TIMEFRAME	LEAD	PARTNER
Long term	DOEE	DC Water

Provide residents with renewable energy by default, sourced from regional wind and solar farms by 2023.

Right now in the District, all residents have the option to purchase electricity generated from renewable energy, as opposed to electricity generated by fossil fuels. The increase in demand for renewable electricity has helped propel growth in the supply of renewable electricity, and the region overall is moving away from energy generated from dirty fossil fuels, and towards energy that doesn't create harmful greenhouse gases or air pollution. Although residents should have the option to choose how their energy is generated, switching the default to clean energy makes it much easier for residents to get their energy from renewable sources.

TIMEFRAME	LEAD
Medium term	DOEE

Expand the use of renewable sources of heating and cooling.

When we typically think about the renewable energy we use in our daily lives, we're thinking about electricity that was generated by wind or solar and distributed to our homes. But renewable thermal energy such as ground-source and air-source heat pumps, heat from wastewater, and biogas (gas created by the decomposition of organic material), can also be used to heat and cool spaces directly, replacing fossil fuels such as natural gas. The District Government will support and incentivize the use of renewable energy in heating and cooling technologies to make use of these underused renewable resources right here in the District.

TIMEFRAME	LEAD	PARTNERS
Ongoing	DOEE	DC Water, DGS, OP

GOAL 3

Modernize energy infrastructure for improved efficiency and resilience.

TARGET 3

By 2032, 100% of residents live within walking facility offering clean back up power to serve critical needs during power outages.

TARGET 3 BASELINE

0%

EN3.1

Use smart meters and smart grid infrastructure to collect data on electricity use.

Smart meters and smart grid infrastructure help individuals and organizations like the DC Sustainable Energy Utility (DCSEU) understand where improvements to buildings could be most effective, because these "smart" systems are able to provide information about when and how a building uses energy. The District Government will collect and use the most accurate and detailed energy data, and make it possible for residents and businesses to access and control their own data. This way residents and government can take advantage of smart meters and other smart infrastructure that already exist throughout the District and make the most effective improvements possible to our buildings, reducing costs by better managing our energy use.

TIMEFRAME	LEAD	PARTNERS
Ongoing	DOEE	DDOT, DGS, OCTO, OP, OPC

EN3.2

Improve the reliability and resilience of the transmission and distribution of electricity, using smart grid technologies and distributed energy resources.

The District imports nearly all of its electricity, meaning that heat waves, severe weather, or other malfunctions in the region can cause power outages. To limit the impact of area-wide power outages, the District Government will improve the reliability and resilience of electricity delivery (including transmission and distribution) by developing and supporting distributed generation, smart grid technologies, and energy storage. Distributed generation technologies like solar power generate electricity close to where it will be used. Smart grid technologies help reduce the number of residents impacted by outages as well as helping restore power quickly after outages. Energy storage, like batteries, provides back-up sources of power, which help ensure that District residents and businesses can bounce back quickly after power outages.

TIMEFRAME	LEAD	PARTNERS
Medium term	DOEE	DDOT, OCTO, OP, OPC

EN3.3

Remove all barriers to modernizing electricity infrastructure to enable the deployment of neighborhood-scale energy systems and distributed energy resources.

Creating a modern energy system that allows for neighborhood-scale systems and recovers quickly after disruptions will require addressing regulatory, political, and physical barriers. Neighborhood-scale systems combine renewable energy sources, energy storage, and the management of electricity demand, all at a local scale that considers the specific needs and energy consumption patterns of the community. The District Government will remove barriers to electricity infrastructure modernization, allowing neighborhoods to cut costs, help the environment, and recover quickly or prevent power outages completely.

TIMEFRAME	LEAD	PARTNERS
Medium term	DOEE	DC Water, DDOT, OCTO, OP, OPC

EN3.4

By 2020, complete and begin implementing a neighborhood-scale energy system development plan to target high load growth areas and at risk communities.

High electricity demand increases the likelihood of a power outage as residents and businesses draw large amounts of power at the same time (like during heat waves when everyone runs their air conditioning). To avoid this scenario, the District Government will launch a project to identify and improve the energy resilience of high load growth areas, paying particular attention to areas where residents may be more sensitive to outages. To improve energy resilience, the District Government will explore the development of neighborhood-scale energy systems (using technologies like microgrids) tailored for the specific needs of the community.

TIMEFRAME	LEAD	PARTNERS
Short term	DOEE	DC Water, OP, OPC