RECOMMENDATIONS

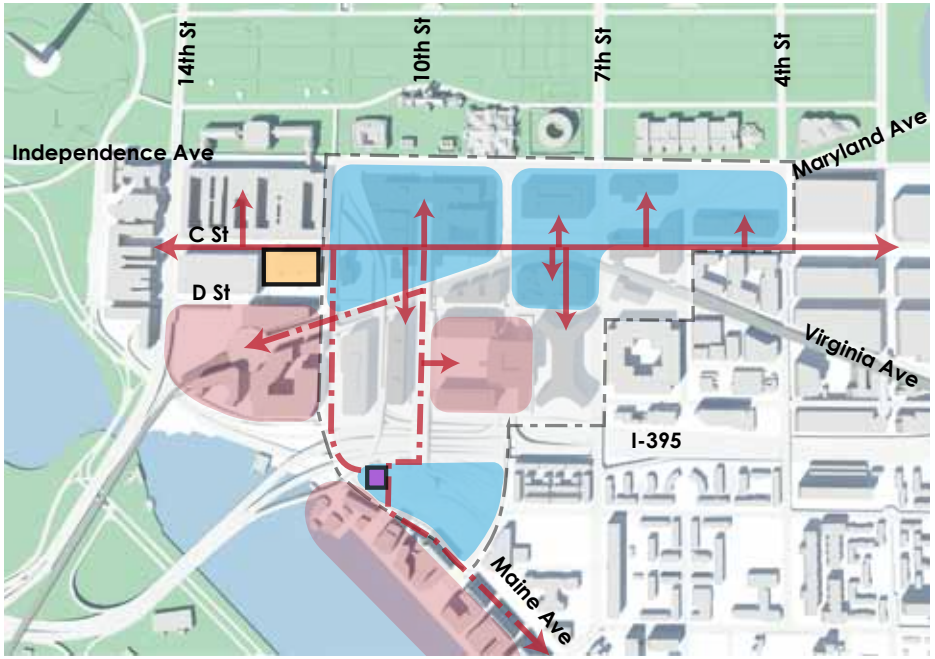
DISTRICT-SCALE:

There are three important district-scale strategies that significantly help the Ecodistrict use less energy overall, and generate and share renewable energy.

CENTRAL UTILITY PLANT In 1933 the federal government built a central utility plant at 12th and C Streets SW to provide heat to federal buildings in downtown Washington D.C. Today the plant predominantly provides heating through steam and also a small amount of cooling to a majority of the federal office buildings within the Ecodistrict and other parts of downtown, in addition to several buildings of the Smithsonian Institution. GSA owns and operates the facility. By law, they can only provide service to federal users. Nearing 80 years old, the plant is in need of modernization and as a result is not very efficient compared to today's standards. Central utility plants, sometimes called combined heat and power or cogeneration, are integrated systems that provide both electricity and heat. These plants have an advantage over conventional single-source electricity plants because they capture waste heat as electricity is produced (from natural gas in this case) and recycle it to provide heat to buildings. Conventional systems simply exhaust heat into the environment, requiring additional fuel to heat the buildings.

- Invest in the existing central utility plant for heating and cooling. Modernize the plant's equipment.
- Increase efficiency by adding new residential and commercial uses throughout the study area and upgrading equipment to support new users. Adding residential uses to the central utility plant would balance loads between day and evening use.
- Change the central utility plant to a less carbonized energy source when the technology is available. While natural gas is significantly better than coal as an energy source, it still produces carbon emissions. Electrofuels such as anhydrous ammonia are an emerging technology under study by the US Department of Energy, which could provide a renewable, carbon-free energy source for the plant in the future.

MICRO-GRIDS Micro-grids are power grids that allow electricity to be produced and used locally. The advantages are numerous: Micro-grids optimize heat energy. Between 60 and 80 percent of a typical power plant's energy consumption never becomes usable electricity, but is instead lost through production and transmission. Energy produced and distributed locally through a micro-grid could be used for electricity and to heat water. Renewable energy produced within the Study Area could be distributed through a micro-grid to other nearby buildings. This creates opportunities for property owners to sell excess power to the regional grid. Adding additional energy sources increases electrical reliability within the area and reducing dependence on the regional power grid. As new areas are redeveloped in locations remote from the central utility plant, they may develop a micro-grid district to balance loads among day and evening use.



DISTRICT-SCALE ENERGY SYSTEMS

Potential Federal/Mixed Use Microgrid
Potential Private Sector Microgrid
CUP
Existing CUP System
Potential Expansion
Sewer Mining Heat

- Establish micro-grids, grouped by development areas of both private and federal buildings, within the Ecodistrict. These micro-grids can be connected together with other buildings that might share power and energy between them.

SEWER-MINING Sewer-mining uses the constant temperature of sewage from buildings to create even warmer heat for nearby buildings. It requires no combustion and works well in densely built areas with high heat consumption, such as residential buildings.

- Build a sewer-mining facility in the southern area of the Ecodistrict to provide heating to new residential and cultural buildings immediately north and south of Banneker Park.