

## Energy and the Built Environment

### Draft List of GHG Emission Mitigation Strategies - Version 3.5

**Format:**

Category - Description
1. Strategy <ul style="list-style-type: none"> <li>• Implementation Action               <ul style="list-style-type: none"> <li>- Tools</li> </ul> </li> </ul>

**Top Priority: Existing Buildings Renovations, Operations, Maintenance, Policies and Occupant Behaviors** - Improve energy performance of existing residential, commercial, industrial, and government buildings through renovations, building operations & maintenance, and occupant policies and behaviors.

1. 2 percent reduction per year (30%) by 2030 in energy & water consumption per year through physical upgrades, operations improvements and occupant actions
  - Implement continuous commissioning and monitoring
  - Increase rainwater harvesting and other re-use technologies
  - Implement low-maintenance, natural landscaping that reduces irrigation needs and cools the air, reducing summer cooling demand
  - Adopt Architecture 2030 goal
  - Increase adoption of Energy Performance Contracts
  - Adopt requirements for energy improvements during building renovations.
  - Implement programs to serve low-income residents and support affordability
  - Adopt benchmarking requirements
  - Adopt energy disclosure requirements
  - Adopt green leasing requirements
  - Water conservation in buildings and sites – manage stormwater; reduce water consumption; natural landscaping
  - Occupant sustainability programs; green concierge
    - PACE
    - Green Bank and Green Financing partnerships
    - Energy Savings Performance Contracting
    - Convert HVAC Systems
    - Fuel Switching
    - On-bill financing
    - Develop incentives, such as utility funded energy efficiency programs
    - EPA Portfolio Manager
    - Energy Dashboards
    - Energy efficient appliances, lighting, HVAC systems
    - Training and education

**Location Efficiency** - Site new facilities to maximize energy and transportation efficiencies and renewable energy opportunities.

2. 10% increase the proportion of new development built in Activity Centers by 2030
  - Update comprehensive plans to include energy and transportation efficiencies as a factor in public facility siting decisions.
  - Utilize economic development policies to foster green economies and green jobs
    - Regional Activity Centers
    - Eco-districts
    - Location efficient mortgages

**New Buildings Design and Construction** - Improve new building standards and incentives.

3. 100% new buildings (Commercial, residential, institutional) are designed to be net zero energy on annual basis by 2050  
 100% of new buildings are designed to Energy Star standards by 2030  
 50 percent of new buildings reach net zero energy by 2040
  - On-site energy systems provide more co-benefits
4. 100% of new buildings use WaterSense fixtures by 2030 to reduce energy needs of water and wastewater
  - Water conservation in buildings and sites – manage stormwater; reduce water consumption; natural landscaping
  - Increase rainwater harvesting and other re-use technologies
  - Reduce irrigation needs with low-maintenance, natural landscaping and weather responsive irrigation systems
5. 100% compliance with most recently adopted IGCC or equivalent building code/energy performance standards by 2020
  - Adopt Architecture 2030 goal
  - Participate in the Living Building Challenge
  - Provide Net Zero or “off grid” Building Incentives
    - Passive House Standard
    - Energy Star
    - Green building bonus density programs
    - Incentivize specific LEED credits
    - ZEPI score
    - Passive and/or active solar design
    - Shade trees to reduce facility energy load

**Public and Private Infrastructure** - Improve the energy performance of public and private built infrastructure.

6. 1% per year (35%) reduction in energy consumption by improving efficiency of public and private infrastructure by 2050
  - Reduce energy waste from transmission and distribution of energy
  - Reduce energy use by water and wastewater systems by reducing leaks, onsite generation, and process improvements 30% by 2030.
  - Implement outdoor lighting replacement programs
  - Implement grid modernization programs
  - Install on-site renewable power systems at industrial and transit sites
    - Convert street lights and other outdoor lights to LED

- Energy Grid 2.0 – explore possibilities for improved grid management to increase efficiency, customer participation and demand flexibility with state regulators, PJM, utilities
- Solar + storage for critical facilities / low emissions public purpose microgrids
- Urban heat island reduction – tree planting, cool roofs, cool pavements, green streets
- Replace all outdoor, tunnel, and station lighting with high efficiency products
- Increase alternative energy generation in all industrial enterprises, including drinking water & waste water utilities
- Install renewable energy generation (hydro turbines) inside water pipes
- Water utilities deploy waste heat recovery in sewer system
- Decrease the leakage rate of the water distribution system

**Energy Source and Supply** - Improve the energy performance of energy generation, including purchase of electricity and natural gas, fuels, and renewables.

7. 30% reduction in emissions from energy generation by 2030
  - Increase Renewable Portfolio Standards (RPSs) to 40% by 2030
  - Increase non-utility Solar PV capacity to 500 MW by 2030
  - Increase energy storage capacity by X percent by 20XX
  - Allow District of Columbia ghg successes to be leveraged in Maryland's Clean Power Plan
  - Phase out coal use at the local coal plants by 2030
  - Expand natural gas supply infrastructure to existing plants
  - Explore the possibility of installing additional units at existing nuclear plants near the region
  - Increase on-site renewable generation
  - Increase renewable/green power purchases
  - Increase efficiency of power plants
  - Publicly-provided Renewable Energy Incentives
  - Provide PACE financing or other financing option
  - Support cooperative purchasing for residential and commercial solar purchasing
  - Support aggregate green power purchasing
    - Solar
    - Biogas CHP
    - Fuel cells
    - Invest in microgrids and district energy
    - EV charging infrastructure connected to solar, and V2G
    - Incentives for residential solar + batteries/EVs
    - Encourage Thermal RECS (TREC)s
    - Explore viability of carbon sequestration at coal plants in the region
8. 20% reduction in methane leaks from natural gas pipelines by 2030

**Resource Recovery, Conservation and Management** - Reduce the carbon footprint of the region's supply chain and resource consumption.

9. Net Zero Waste by 2050
  - Increase the recycling rate of the region to 75%
  - Increase reuse of construction /demolition waste by 20% by 2030.
  - Divert 100% of organic waste by 2040
  - Implement Green Purchasing and Procurement Programs
  - Waste to energy

**Non-road engines** (off-road vehicles and equipment with small combustion engines and motors such as tractors, loaders, golf carts, lawnmowers, generators, etc.)

10. 2% per year (30%) reduction in greenhouse gas emissions from non-road sources by 2030

- Increase market penetration of energy efficient alternatives for small engines including back-up generators, construction equipment, agriculture, lawn and garden equipment, construction equipment, commercial and industrial equipment, and recreational equipment
  - Buyback programs such as electric lawnmower exchanges
  - Upgrading to more efficient or natural gas engines
  - Renewable energy - powered battery backups
  - Fuel switching to electric

**Awareness and Education** - Increase the ability of residents in the region to conserve energy and reduce emissions.

11. Move education to action - Create measurable results through community energy engagement

- Educate on costs and benefits
- Increase motivation through incentives
- Create a culture of responsibility
  - Energy education initiatives/programs to address behavior and promote conservation
  - Community energy challenges with businesses, HOA's, neighborhoods
  - Encourage/incentivize new energy efficiency program ideas, such as in-home displays linked with smart meters, dynamic/TOU pricing, disaggregation by appliance
  - Promote green power purchase