Multi-Sector Work Group Strategies and CEEPC Action Plan Comparison

The CEEPC Action Plan, adopted in 2013, includes a list of more than 50 actions, mainly for local government implementation to help move the region toward the regional greenhouse gas (GHG) emission reduction goal of 20% by 2020 (below 2005). The 2015 Multi-Sector Work Group (MSWG) initiative is in the process of developing strategies to analyze what needs to be done to meet both the 2020 goal and the 2050 goal of 80% below business as usual projections. The MSWG is analyzing existing ideas as well as concepts that were beyond the scope of the 2013 CEEPC Action Plan. This document compares MSWG Task 3 strategies as of May 8, 2015 to the 2013 Action Plan strategies.

The MSWG initiative is focused on strategies to reduce GHG emissions; and therefore, does not include some implementation actions in the CEEPC Action Plan that do not directly link to GHG emission reduction. A list of CEEPC Action Plan implementation actions that are not included in the MSWG strategy groups are listed on page 14.

Table 1. Energy and Built Environment GHG Reduction Strategies

MSWG Strategy	MSWG Measure Description (including possible Implementation Actions)	Related CEEPC Action Plan Implementation Actions
I. Existing Buildings		
EBE-1: Achieve annual and cumulative reductions in energy and water consumption in existing buildings Scenario: • 2% annual reduction, 30% cumulative by 2030	Leverage utility ratepayer-funded programs to drive energy performance improvements via incentives and technical assistance • Implement continuous commissioning and monitoring, leveraging utility advanced metering data and related utility service offerings. Adopt Architecture 2030 goal, adapted for existing buildings. Extend enforcement of building energy code provisions to better address existing building stock • Adopt new building code-related requirements for energy improvements during renovations, additions, major alterations. Reduce water usage via planning/zoning policies, water utility partnerships • Reduce site water loss via rainwater harvesting and other re-use technologies, stormwater runoff reduction, low maintenance natural landscaping. • Improve water conservation in buildings via fixture efficiencies. Drive private building energy and water performance via mandatory	<u>Energy Efficiency section</u> • #5: Local government facility energy benchmarking • # 6: Participation in regional EPA Portfolio Manager account sharing • #7: Local government facility energy performance disclosure • #8: Local government facility energy plans • #9: Energy audits • #10: US DOE Better Buildings Challenge participation <u>Energy Financing section</u> • #14: Financing programs for residential and businesses to implement energy efficiency and renewable energy projects <u>High Performance/Green Building section</u> • #16: Green affordable housing • #18: Green leasing <u>Water Resources section</u> • #19: Water utility energy efficiency and renewable energy measures • #20: Water utility water reuse project

	benchmarking, and voluntary challenge initiatives • Adopt benchmarking and disclosure requirements. • Adopt green leasing requirements for public agencies, guidelines for private entities. • Implement occupant sustainability programs, such as upcoming EPA Tenant Star Expand low-income housing energy and water savings by leveraging federal, state, utility resources. • Implement programs to serve low-income residents and support affordability. Expand financing options for energy and water efficiency and renewable energy. • Enable PACE financing via property tax systems. • Develop Green Bank facilities (New York State, Virginia examples). • Provide credit enhancement mechanism such as loan loss reserves. • Support loan aggregation/secondary market development (e.g. WHEEL) • Drive public/institutional energy and water savings via performance contracting, especially for public and institutional buildings.	
EBE-2. Support existing building-level renewable energy development Scenario: • Included in EBE-6 level	Support cooperative/aggregated renewable energy purchasing for public, residential and commercial sectors Provide incentives for building-level renewable technologies (e.g. property tax abatements, density allowances). Adopt solar access ordinances and similar regulations to support renewable development.	<u>Energy Financing section</u> • #14: Financing programs for residential and businesses to implement energy efficiency and renewable energy projects
II. Location Efficiency		
EBE-3: Encourage development in activity centers	Update comprehensive plans to include energy and transportation efficiencies as a factor in public facility	<u>Energy Efficiency section</u> • #12: community energy planning initiatives (deploy combined heat

Scenario: • increase in the proportion of new development built in Activity Centers by 2030. (Cross-referenced with Land Use strategies (L-2); primary assessment to be conducted by Land Use subgroup)	siting decisions. Update zoning policies and permitting guidelines to encourage low-impact site development, e.g. "rain garden" runoff landscaping, xeriscaping. Locate development at sites and in densities that can be served by efficient and renewable district energy systems. Encourage activity-center residential density to reduce average housing unit size and energy demand. Tie development review to GHG performance; e.g. locating new development in activity centers could be linked to a GHG credit or bonus.	and power, district energy, microgrids) <u>Land Use section</u> • #34: Land use plans that allow for and incentivize walkability, higher density, mixed use, mixed income and/or transit oriented development in activity centers • #35: Identify, promote and incentivize greyfield/brownfield redevelopment • #36: Local government facility at former greyfield/brownfield sites <u>Green Infrastructure section</u> • #41: Green infrastructure/natural resource/ green space plans • #42: Tree City USA • #43: Tree canopy/forest cover goal • #44: Local govt green roof • #45: Green street polices
III. New Buildings		
EBE-4: Improve new building energy and water efficiency performance Scenario: • 100% compliance with most stringent ICC (including IGCC) or ASHRAE building code/energy performance standards by 2020 • 100% of new buildings designed to meet ENERGY STAR Target Finder performance levels by 2030 • 100% of new buildings use WaterSense fixtures by 2030 to reduce energy needs of water and wastewater) • 50% of new buildings designed to be net zero	Adopt and enforce updated building codes and energy performance standards Develop building code compliance efforts, including utility programs. Create electric vehicle "charging-ready" infrastructure code provisions. Adopt Architecture 2030 goals in public policies. • Express preference for zero-energy performance levels via planning/zoning/permitting policies and practices (typically non-binding but encourage developers to bring such projects forward). Provide Net Zero building incentives, such as property tax abatements (e.g. Green Building tax credits) or permitting prioritization policies. Integrate green power purchasing into new building policies to offset any remaining site energy use. • Support development of long-term utility "green tariff" policies tied to meter address or other actions.	<u>High Performance/ Green Building section</u> • #15: Green building policies • #16: Green affordable housing • #17: Local government incentives for green/high efficiency buildings <u>Water Resources section</u> • #19: Water utility energy efficiency and renewable energy measures <u>Renewable Energy section</u> • #21: 5,000 installed solar systems • #22: Renewable energy on local govt property • #23: EPA Green Power Partners • #24: EPA Green Power Communities <u>Green Infrastructure section</u> • #41: Green infrastructure/natural resource/ green space plans • #42: Tree City USA • #43: Tree canopy/forest cover goal • #44: Local govt green roof • #45: Green street polices

energy by 2040 • 100% new buildings designed to be net zero energy by 2050. *Targets may need to be adjusted by building type; green power/other offset mechanisms likely to be needed*)	Require new building sites to meet low-impact site development requirements, e.g. "rain garden" runoff landscaping, xeriscaping. Adapt planning/zoning policies and work with water utilities to increase rainwater harvesting and other re-use technologies, manage storm water, and encourage low- maintenance natural landscaping. Update planning/zoning policies and work with water utilities to improve water conservation in buildings to reduce water consumption. Create building code-related policies to mandate WaterSense or comparable performance levels in applicable fixtures.	
IV. Public and Private Infrastructure		
EBE-5: Achieve annual and cumulative reductions in fossil energy use by improving Infrastructure efficiency and increasing renewable energy use Scenario: • 1% annual reduction in fossil energy use, 35% cumulative by 2050	Reduce energy use by water and wastewater systems by reducing leaks, increasing onsite generation, increasing system efficiency, and fostering process improvements, by working through institutional and utility programs. Implement outdoor lighting and other end-use efficiency technologies, working through institutional and utility programs. Install on-site renewable power systems at facility and transit sites by working through institutional and utility programs.	<u>Energy Efficiency section</u> • #11: Efficient outdoor lighting (i.e. streets, parking lots, signage) <u>Renewable Energy section</u> • #21: 5,000 installed solar systems • #22: Renewable energy on local govt property • #23: EPA Green Power Partners • #24: EPA Green Power Communities • #25: Two renewable energy parks
V. Energy Source and Supply		
EBE-6: Achieve targeted reductions in power sector emissions Scenario: • 30% reduction in emissions from energy generation by 2030 (on a total emissions (mass) basis rather than an emission-rate basis)	Support state plans to achieve a 30% mass-based reduction in electrical generation emissions. • Allow District of Columbia GHG successes to be leveraged in Maryland's Clean Power Plan. • Phase out coal use in regional coal plants by 2030. • Explore the possibility of installing additional units at existing regional nuclear plants. • Increase efficiency of thermal power plants. Support increases in state Renewable	<u>Energy Financing section</u> • #14: Financing programs for residential and businesses to implement energy efficiency and renewable energy projects <u>Renewable Energy section</u> • Goal: Increase renewable energy production to 10% of total regional electricity consumption • #21: 5,000 installed solar systems • #22: Renewable energy on local govt property • #23: EPA Green Power Partners • #24: EPA Green Power

	Portfolio Standards (RPS) to 40% by 2030. • Increase Solar PV capacity via RPS carve outs or other policies. Increase electric-grid energy storage capacity by supporting utility investments in grid storage technology. Reduce energy waste from transmission and distribution of energy by supporting utility efforts to upgrade grid efficiencies via efficient transformers, smart grid technologies, etc. Expand natural gas supply infrastructure to existing and new power plant sites. Sustain and expand federal, state and local grid-scale renewable energy incentives, e.g. federal PTC	Communities • #25: Two renewable energy parks
EBE-7: Achieve targeted reductions in reduce natural gas pipeline leaks Scenario: • 20% reduction in methane leaks from natural gas pipelines by 2030)	Support utility investments by encouraging utility commission action on cost recovery.	
VI. Resource Recovery, Conservation and Management		
EBE-8: Achieve targeted reduction in municipal solid waste Scenario: • Net Zero Waste by 2050	Increase the recycling rate of the region to 75%, via waste collection fees and other policies. Increase reuse of construction /demolition waste by 15% by 2020 and 100% by 2050 via tipping fees, builder incentives, and similar measures. Divert 100% of organic waste by 2040 via tipping fees, waste collection fees and other measures. Implement green purchasing and procurement programs via government agency and private sector commitments. Increase use of waste to energy plants, including landfill gas projects.	<u>Waste Reduction and Recycling section</u> • #50: Divert 50% of solid waste in the region from disposal • #51: Recycling support to schools • #52: No curbside collection of grass/leaf waste in plastic bags; loose/paper bags only • #53: Establish sufficient regional capacity for organic composting <u>Water Resources section</u> • #19: Water utility energy efficiency and renewable energy measures • #20: Water utility water reuse project <u>Green and Local Economies section:</u>

		• #46: Green purchasing policies
VII. Non-road Engines		
EBE-9: Reduce emissions from non-road engines Scenario: • 2% annual, 30% cumulative reduction in greenhouse gas emissions from non-road sources by 2030	Increase market penetration of energy efficient alternatives for non-road engines including back-up generators, construction equipment, agriculture, lawn and garden equipment, construction equipment, commercial and industrial equipment, and recreational equipment, as listed in the MWCOG Gold Book.	
VIII. Awareness and Education		
EBE-10: Educate and motivate public through community engagement Move education to action - Create measurable results through community energy engagement.	Educate on benefits and costs of clean energy technologies and behaviors, via school curricula and public information campaigns. Increase motivation through incentives and other measures, linked to utility customer education and information services. • Use utility advanced metering data to monitor and influence behavior. Create a culture of responsibility via school curricula and public information campaigns. Encourage employee behavior change to increase teleworking and commuting by public transportation through actions such as the "Commuter Connections" program.	<u>GHG Inventory section</u> • # 1: GHG inventories for government operations • # 2: Community wide GHG inventories • # 3: GHG emission reduction plans for government operations • # 4: Community wide GHG reduction plans <u>Energy Efficiency section</u> • #13: Household participation in Home Performance with Energy Star <u>Outreach section</u> • #54: Promote energy efficiency and renewable energy incentive programs • #55: Residential energy/ sustainability challenges • #56: Commercial energy/ sustainability challenges • #57: Encourage private sector energy performance benchmarking • #58: Local government employee energy/ sustainability education • #59: Advocacy to reduce energy efficiency and renewable energy barriers and support mitigation and adaptation action

Table 2. Transportation and Land Use GHG Reduction Strategies

Strategy Type/Focus	Measure Description (including possible Implementation Actions)	Related CEEPC Action Plan Implementation Actions
TLU-1: Increase urban tree canopy and land stewardship Scenario: • 2020: Project effects of 2020 development increment on canopy coverage; possibly augment with tree preservation/planting programs in short term • 2040: Link tree and undeveloped land cover to base and stretch scenarios.	Measures to maintain/increase open space, tree canopy, and green infrastructure through sustainable landscaping and land management practices: • Maximize urban canopy • Tree conservation ordinances • Conservation of open space • Regional mitigation bank • Shifting more new development into activity centers with smaller environmental footprint (through measures like L-2 and L-3 below) and thus preserving existing undeveloped lands. • Commercial and residential landscaping should follow Climate, Community, and Biodiversity Standards • Reduce impervious surfaces to minimize water treatment energy needs to remove phosphorus, nitrogen, and sediment • Support soil and forest carbon sequestration	<u>Green Infrastructure section</u> • #41: Green infrastructure/natural resource/green space plans • #42: Tree City USA • #43: Tree canopy/forest cover goal • #44: Local govt green roof • #45: Green street polices <u>Green and Local Economies section</u> • #47: Support for community gardens • #48: Working farmland preservation
TLU-2: Sustainable Development Patterns & Urban Design (including Enhancements for Non-motorized Modes) Scenario: • 2020: Run base CLRP land use and transport networks (don't have 2020 AC growth assumptions – can't tell if meaningful shifts are available) • 2040: Run base CLRP land use and networks • 2040 stretch: Reallocate growth and balance into and among centers, accounting for	Measures to encourage a higher share of new development in regional activity centers (RACs), together with associated sustainable urban design factors, such as: • Build near transit (transit-oriented development) and/or enhance existing transit service levels • Higher densities • Greater mix & balance of uses • Street network/walk friendly • Management of parking supply/cost • Greater mix of housing options RE size and affordability • School locations, design and access Recommend testing as a package of the above, in three different levels: • Constrained Long-Rangy Plan (CLRP) activity levels and networks (with assumed growth in RACs)	<u>Transportation section</u> • #27: Local government commute option programs • #28: Regional commuter options program • #29: Bicycle/pedestrian plans • #30: Complete streets policies <u>Land Use section</u> • #34: Land use plans that allow for and incentivize walkability, higher density, mixed use, mixed income and/or transit oriented development in activity centers • #35: Identify, promote and incentivize greyfield/brownfield redevelopment • #36: Local government facility at former greyfield/brownfield

proximity to rail transit, jobs/housing ratios, holding capacity and other factors	• Maximum shift to RACs: assume entire 2014-2040 growth increment into RACs • Augmented: increase above current planned levels, rule-based targeting to centers by place type (transit service, location in major corridors) Efforts to foster greater jobs/housing balance, particularly by targeting more residential opportunities to areas with high jobs/housing ratios. Key actions embodied in this strategy include: • Housing affordability (especially in center city and inner suburban jurisdictions and areas near transit) • Live Near Your Work incentives • Balancing job opportunities between west and east region • More job opportunities in bedroom communities and exurban satellite cities • Incentivize jobs in eastern region Ensure adequate pedestrian and bicycle infrastructure and connectivity in activity centers to support walking and biking as modes, as well as access to transit. Key actions embodied in this strategy include: • Local street networks meeting block size or intersection density criteria • Complete streets concepts • Traffic calming measures. • On & off-road bicycle networks and storage facilities Actions embodied in this strategy include: • Higher retail/service to households or employment ratios • Location incentives for retail • Easing/changing zoning to allow broader array of retail/service options, locations • Retail must be located strategically within centers This measure seeks to locate as	

	much of new or relocated government employment near premium transit (Metro, commuter rail, LRT/BRT), including: • Federal agencies • State agencies • Regional, county and municipal agencies Measures designed to increase the share of bike/walk trips, such as: • Complete streets policies • Increased bike-sharing • Completion of bicycle/pedestrian enhancements • Increased connectivity of pedestrian network (especially in cul-de-sac developments), require sidewalks on all streets except freeways which should have parallel trails, connect communities to parks, and identify and complete trails with maximum potential	
TLU-3: Improve Fuel Economy of Light-duty Vehicle Fleet Scenario: • 2020: Increase % of light-duty zero emission vehicles (ZEVs) to 2% of total vehicle population in study region • 2040: Increase % of light-duty ZEVs to 15% • 2040 stretch: Increase % of light-duty ZEVs to 25%	Measures to incentivize more fuel efficient passenger vehicles: • Implement a "Cash for Clunkers" program to encourage replacement of older, less fuel efficient vehicles • Offer incentives for consumer/private sector purchase of electric vehicles and charging equipment • Offer incentives for purchases of fuel-efficient vehicles (fee-bates) • Provide disincentives for purchases of fuel-inefficient vehicles (gas guzzler tax/registration fees) • Adoption of CA Low-Emission Vehicle (LEV) Phase II program	<u>Transportation section</u> • #31: Green fleet policies • #32: Local government alternative fuel vehicle infrastructure projects

TLU-4: Increase Alternative Fuels in Public Sector Fleets Scenario: • 2020: Add X(TBD) CNG buses to public transit fleet • 2040: Increase % of ZEVs in municipal light-duty fleets to 15% of total fleet population; require B5 in all municipal fleets and school buses; require X%(TBD) of public transit fleet to be converted to CNG • 2040 stretch: Increase % of ZEVs in municipal light-duty fleets to 25% of total fleet population; require B20 in all municipal fleets and school buses; require X% (TBD) of public transit fleet to be converted to CNG	Measures to incentivize more fuel efficient passenger vehicles: • Implement a "Cash for Clunkers" program to encourage replacement of older, less fuel efficient vehicles • Offer incentives for consumer/private sector purchase of electric vehicles and charging equipment • Offer incentives for purchases of fuel-efficient vehicles (fee-bates) • Provide disincentives for purchases of fuel-inefficient vehicles (gas guzzler tax/registration fees) • Adoption of CA Low-Emission Vehicle (LEV) Phase II program	<u>Transportation section</u> • #31: Green fleet policies • #32: Local government alternative fuel vehicle infrastructure projects
TLU-5: Clean Freight Technologies Scenario: • 2020: Add one truck stop electrification (TSE) location with 30 bays in study region • 2040: Add five additional TSE locations with 30 bays/location • 2040 stretch: Add eight additional TSE locations with 30 bays/location	Measures to reduce emissions associated with freight: • Engine and powertrain technologies to improve fuel efficiency (e.g., hybrids, plug-in electric, and alternative fuel vehicles) • Vehicle technologies to improve fuel efficiency (e.g., aerodynamic devices, low rolling resistance tires, tire pressure systems, idle reduction technologies) • Operational strategies (e.g., routing software, engine governors, truck-stop electrification, efficient truck refrigeration units, off-peak delivery incentives) • Clean truck corridor infrastructure (e.g., overhead catenary systems, linear synchronous motors, in-road battery charging capabilities)	<u>Transportation section</u> • #26: Idling regulations and enforcement

TLU-6: Low Carbon Fuel Standard Scenario: • 2020: N/A • 2040: Reduce fuel emissions in region by 10% • 2040 stretch: Reduce fuel emissions in region by 15%	Implement market-based program to reduce carbon intensity of on-road fuels through use of lower-carbon alternatives (e.g., natural gas, electricity, biofuels, hydrogen)	
Enhancing system operations (T-7, T-8, and T-11) Scenario: • 2020: 20% of drivers adopt eco-driving practices; corridor operational improvements reduce travel time by 10% • 2040: 80% of drivers adopt eco-driving practices; corridor operational improvements reduce travel time by 20% • 2040 stretch: 100% of drivers utilize eco-driving practices; corridor operational improvements reduce travel time by 25%	Apply cost effective operational improvements to freeways and arterials/collectors, such as: • Integrated corridor management (ICM) on freeway and major arterial corridors • Implement ramp metering • Freeway operations patrols / faster incident management • Signal retiming • Roundabouts • Intersection efficiency improvements Promote driving patterns to reduce rapid acceleration/deceleration and extended idling System efficiency improvements through connected vehicles, such as vehicle-to-vehicle, vehicle-to-infrastructure, and autonomous vehicles	

TLU-8: Reduce Speeding on Freeways Scenario: • 2020: Average speeds on freeways (outside of congested periods) reduced to 57 mph. • 2040: Average speeds on freeways (outside of congested periods) reduced to 57 mph. • 2040 stretch: Average speeds on freeways (outside of congested periods) reduced to 55 mph. Incorporate into Operational Improvements Strategy Scenario.	Enforce speed limits on freeways and included GHG surcharge as part of enforcement	
TLU-9: Travel Demand Management Scenario: • 2020: Expand employer-based incentives (subsidies of $50 per month for 40% of employers); 50% of parking in activity centers is priced at average of at least $8 per day ($1 per hour) • 2040: Expand employer-based incentives (subsidies of $50 per month for 80% of employers); 90% of parking in activity centers is priced at average of at least $8 per day ($1 per hour) • 2040 stretch: Expand employer-based incentives	Measures to reduce the availability of free parking in activity centers, such as: • Parking impact fees • Parking caps • Parking pricing for on and off-street parking Measures designed to incentives carpooling/ridesharing, non-motorized modes, and telecommuting, such as: • Expanding telecommuting • Carpool incentive programs • Vanpool incentive programs • Increased employer outreach • Ordinances to require employers to offer parking cash out / transit benefits	<u>Transportation section</u> • #27: Local government commute option programs • #28: Regional commuter options program • #33: Car sharing programs

(subsidies of $80 per month for 100% of employers); 100% of parking in activity centers is priced at average of at least $8 per day ($1 per hour)		
TLU-10: Transit Enhancements Scenario: • 2020: Reduce transit travel times by 5% and reduce headways (wait time) by 5% on 10 major commute corridors • 2040: Reduce transit travel times by 20% and reduce headways (wait time) by 20% on 24 major commute corridors • 2040 stretch: Reduce transit travel times by 30% and reduce headways (wait time) by 30% on 24 major commute corridors; reduce wait time by 10% on all other corridors (assumed due to improved traveler information)	Measures designed to increase the share of transit trips through increased/improved services, such as: • More neighborhood circulator buses • Enhanced commuter bus services • Real-time bus scheduling information • Transit signal priority improvements / bus rapid transit • Expand Metrorail / Commuter rail • Bus stop improvements (benches, shelters) • Increase schedule coordination between transit agencies • Bus on Shoulder • Transit access improvements to eliminate drive access to bus • System of dedicated bus lanes • Bus infrastructure commitments	
TLU-11: Transit Incentives / Fare Reductions Scenario: • 2020: Reduce transit fares during off-peak periods by 5% by offering monthly passes or providing free trips for students or free transfers • 2040: Reduce	Measures designed to incentivize transit use through lower fares, such as: • Reduced price monthly transit passes • Free bus-rail transfers • Free off-peak bus service	

transit fares regionally by 20% • 2040 stretch: Reduce transit fares regionally by 40% partially funded through pricing strategies		
TLU-12: Road Pricing Scenario: • 2020: None – Long-term scenario only; but potentially assume 20 percent of drivers switch to Pay-As-You-Drive insurance • 2040: Full VMT-based pricing at $0.25 per mile [May consider option for pricing only all freeways, but challenging without more detailed modeling • 2040 stretch: Full VMT-based pricing on road network at $0.25 per mile peak. Cordon pricing into downtown DC at $5 [Need to determine if can forecast, and overlaps with transit service enhancements and fare reductions]	Pricing freeway travel, such as: • Electronic tolling of major bridges and connectors • Conversion to full electronic tolling VMT-based vehicle fees Adding roadway pricing for entering major activity centers across the region (e.g., downtown Washington, Tysons Corner)	

Implementation actions from the CEEPC Action Plan that are not included in the MSWG strategies and actions include:

- #37: Assess community vulnerabilities
- #38: Adopt community resiliency strategies
- #39: Assess vulnerability of critical assets for transportation and utility infrastructure
- #40: Energy assurance planning