

Policy Considerations for the Maryland Commission on Climate Change

Mitigation



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Mitigation Policy Considerations for the Maryland Commission on Climate Change

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This memorandum identifies policy issues that may be of interest to the Maryland Climate Change Commission (MCCC) as it finalizes its November 2016 report on the status of Maryland's climate change efforts and recommendations for legislative action,² and develops its 2017 workplans. The memorandum focuses on two broad areas. First, it provides updates on significant state actions from the past year relating to the setting of state GHG goals and tracking progress toward those goals, including actions in California and Pennsylvania related to the accounting of methane emissions from the natural gas sector and new regulatory initiatives in Massachusetts to reduce GHGs from the transportation and natural gas sectors. Second, it highlights emerging issues in four strategy areas that states have indicated are of particular interest in the near term. These include state actions to reduce methane emissions from the natural gas supply chain; approaches to incorporating climate goals into state grid-of-the-future proceedings; addressing environmental justice and equity concerns in state climate actions; and pursuing regional actions to reduce emissions from the transportation sector through EV infrastructure development.

The Georgetown Climate Center (GCC) is a non-partisan law and policy research center based at Georgetown University Law Center that serves as a resource to states to advance climate policy.³

GCC has provided support to Maryland state agencies in a number of capacities, including submitting a memorandum to the Maryland Commission on Climate Change in 2015 and serving as a facilitator of inter-state collaborations that Maryland participates in, including the Transportation and Climate Initiative (TCI).

The Climate Center is also funded by the Town Creek Foundation to serve as a resource to the MCCC.⁴

This memorandum is based on conversations with state officials and independent research that the Georgetown Climate Center has conducted to help inform Maryland and other states that are setting mid-term goals, implementing policies to meet those goals, and tracking their progress.

¹ The authors thank Georgetown Climate Center Executive Director Vicki Arroyo and Deputy Director Kate Zyla for their insights and review of this memorandum.

² Md. HB 514 §2-1304.

³ Georgetown Climate Center, www.georgetownclimate.org.

⁴ See Briefing letter from Stuart Clarke to Members of the Steering Committee of the Maryland Climate Change Commission, April 22, 2015, http://www.mde.state.md.us/programs/Marylander/Documents/Attachment_2_Outside_Resource_Memo_for_4.23_MCCC_Steering_Committee_Meeting.pdf.

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I. Recent Developments Related to State GHG Goal Setting and Assessment of Emission Reductions

This section describes recent developments from a variety of states related to setting and tracking progress toward goals, building on the Georgetown Climate Center's 2015 analysis of interim state GHG goals.⁵

As one of the potential priorities for the mitigation working group in 2017 is supporting the Maryland Department of the Environment's (MDE) efforts to enhance the GHG emissions inventory to include methane,⁶ processes in California and Pennsylvania may be of particular interest to the MCCC. The California summary describes ways the state is responding to new legislation that will require a detailed assessment of lifecycle emissions from the natural gas supply chain, including natural gas that is imported into the state. Pennsylvania, which is a major producer of both natural gas and electricity in the PJM region, recently issued an updated Climate Action Plan that quantifies methane emissions from its natural gas facilities, but also acknowledges that emissions may be higher than estimated and lays out potential future actions to better quantify and reduce methane emissions.

In Massachusetts, the commonwealth is responding to a ruling of its state supreme court that will require additional regulatory action to establish declining mass-based GHG limits on multiple sectors in the state. In response to this decision, Governor Charlie Baker issued an executive order that, among other things, directs state agencies to work toward a regional solution to reduce emissions from transportation, the state's largest source of GHG emissions. This may be of interest to the MCCC given that both Maryland and Massachusetts participate in the Transportation and Climate Initiative (TCI), and that several TCI jurisdictions have announced publicly that they are working through TCI to explore regional market-based programs that can reduce GHG emissions.

Finally, this section includes an executive order from Virginia Governor Terry McAuliffe directing the state to develop recommendations to reduce carbon pollution from the power sector, and a note that the state of Delaware adopted its proposed 2030 climate goal.

A. California 2030 Target, Analysis of Out-of-State Methane Emissions

1. California Establishes 2030 Target

On September 8, 2016, California Governor Jerry Brown signed new legislation that requires the state to reduce GHG emissions 40 percent below 1990 levels by 2030. The legislation—Senate Bill 32—puts into law the 2030 target that had first been established by Governor Brown through an executive order in April 2015.⁷ SB 32 extends the California Global Warming Solutions Act of 2006 (AB 32), which required the state to return to 1990 emission levels by 2020, and provides the California Air Resources Board (CARB) with broad authority to adopt rules and regulations to achieve the GHG emissions reduction target. SB 32 requires the

⁵ Georgetown Climate Center Memorandum to Maryland Commission on Climate Change (2015).

⁶ MARYLAND DEPARTMENT OF THE ENVIRONMENT, POTENTIAL PRIORITIES FOR 2017 WORK PLAN (2016) [hereinafter 2017 POTENTIAL PRIORITIES].

⁷ Office of Governor Edmund G. Brown, Jr. Governor Brown Establishes Most Ambitious Greenhouse Gas Reduction Target in North America (April 29, 2015) <https://www.gov.ca.gov/news.php?id=18938>

California Air Resources Board to meet the new, stringent emissions reduction requirement in a way that is beneficial to the state's most disadvantaged communities.⁸

⁸ California Senate Bill No. 32 (September 08, 2016), https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32

2. California 2016 Emission Inventory

As required by AB 32, CARB adopted regulations that require the reporting and verification of statewide greenhouse gas emissions.⁹ CARB's Mandatory Reporting of Greenhouse Gas Emissions rule requires that industrial sources, suppliers of fuels provided for consumption within California, carbon dioxide suppliers, electric power entities, and operators of petroleum and natural gas systems must submit an annual greenhouse gas emissions data report.¹⁰ The reported data must be compiled using the methods specified for that source category in the Environmental Protection Agency's (EPA) mandatory greenhouse gas reporting program.¹¹ The data gathered from this process is then combined with emission estimates from state, regional, and federal data sources to produce California's greenhouse gas emission inventory.¹² An updated greenhouse gas emission inventory is published annually.¹³ The inventory is a critical piece in demonstrating the state's progress in achieving its statewide greenhouse gas target.¹⁴

As part of California's reporting regulation, importers of electricity are also required to report *direct* GHG emissions associated with electricity generated at out-of-state facilities (these importers also have a compliance obligation under California's cap-and-trade program).¹⁵ Importers may either report emissions from a specific facility, if the delivered electricity can be traced to a specific resources, or they report electricity based on a regional emissions factor established by the California Air Resources Board.¹⁶ The current reporting regulations do not require reporting of methane leakage from the natural gas supply system, but as described below, new California statutes will require a detailed study of methane emissions arising from natural gas imports to California.

The 2016 California inventory report tracked greenhouse gas emissions for the years 2000 to 2014.¹⁷ It showed that total greenhouse gas emissions were 441.5 million metric tons of carbon dioxide equivalent (MMTCO₂e),¹⁸ 10 MMTCO₂e over the 2020 limit of 431 MMTCO₂e.¹⁹ The next report will be released sometime in 2017.

3. Requirements to Track Methane Emissions from Natural Gas Imports

⁹ CAL. HEALTH & SAFETY CODE § 38530(a) (2016).

¹⁰ CAL. CODE. REGS. 17 § 95101(a)(1) (2016); CAL. AIR RES. BD., *2014 GHG Emissions Data*, <https://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm> (last updated Dec. 4, 2015).

¹¹ CAL. CODE. REGS. 17 § 95101(a)(2).

¹² CAL. AIR RES. BD., *California Greenhouse Gas Emission Inventory – 2016 Edition*, <https://www.arb.ca.gov/cc/inventory/data/data.htm> (last reviewed June 17, 2016).

¹³ *Id.*

¹⁴ CAL. AIR RES. BD., CALIFORNIA GREENHOUSE GAS EMISSIONS FOR 2000 TO 2014 – TRENDS OF EMISSIONS AND OTHER INDICATORS, 1 (2016), https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf.

¹⁵ CAL. CODE. REGS. 17 § 95111.

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ CAL. AIR RES. BD., *California 1990 Greenhouse Gas Emissions Level and 2020 Limit*, <https://www.arb.ca.gov/cc/inventory/1990level/1990level.htm> (last reviewed May 6, 2015).

In 2015 and 2016 California adopted new requirements that the state analyze lifecycle emissions of natural gas imported into the state, including methane leakage from the natural gas supply chain.

Imported natural gas accounts for approximately 50 percent of electricity consumed in California.²⁰ Assembly Member Tony Thurmond, the sponsor of one of the bills, indicated that he was motivated by concerns about methane hot spots and his desire that California fully account for the regional and global impacts of the state's consumption of natural gas as an international partner in reducing GHG emissions.²¹

In 2015, the California legislature passed Assembly Bill 1496, which requires the California Air Resources Board (to carry out a life-cycle GHG analysis of natural gas produced and imported into the state, including methane emissions.²² The analysis is to be produced by using the best available and cost-effective scientific and technical methods.²³ The bill requires CARB to consult with federal and state agencies, independent scientific experts, and "any other appropriate entities" to gather or acquire the necessary information to conduct this analysis.²⁴ The legislation does not require that the life-cycle analysis be included in the state's GHG inventory.²⁵ In addition, the legislation requires CARB to monitor and measure high-emission methane hot spots in the state, in collaboration with air districts that monitor methane.²⁶

On September 13, 2016, California Governor Jerry Brown signed the budget bill for natural resources agencies, Senate Bill 839, which included a provision that requires the California Energy Commission (CEC) to report to the budget committees in both houses of the California legislature on the resources needed to provide data from "natural gas participants" to CARB to support implementation of AB 1496.²⁷

In response to these bills, CARB is planning to undertake a sophisticated analysis of the GHG life-cycle emissions from natural gas that is imported and consumed in California. The approach that CARB is exploring would aim to evaluate actual lifecycle-emissions from the individual natural gas fields and transmission facilities that supply natural gas to California.²⁸ This detailed approach is required by SB 839, which tasks CARB with quantifying emissions from "specific natural gas infrastructure."²⁹ The language of the statute also directs CARB to analyze "natural gas produced and imported into the state"; it does not explicitly charge CARB with analyzing lifecycle emissions associated with natural gas that is combusted outside of the state for the purpose of supplying electricity into the state, and it is not clear whether

²⁰ See U.S. ENERGY INFO. ADMIN, CALIFORNIA: PROFILE ANALYSIS, <https://www.eia.gov/state/analysis.cfm?sid=CA> (last updated Sept. 17, 2015).

²¹ Press Release, Assembly Member Tony Thurmond, Thurmond Moves California a Step Toward its Environmental Goals (Oct. 8, 2015), <http://asmcd.org/members/a15/news-room/press-releases/thurmond-moves-california-a-step-toward-its-environmental-goals>.

²² CAL. HEALTH & SAFETY CODE § 39731(b) (2016).

²³ *Id.*

²⁴ *Id.*

²⁵ See generally *id.*

²⁶ *Id.* § 39731(a).

²⁷ Cal. Senate Bill 839, chap. 6.5 (2016).

²⁸ Telephone interview of CARB staff (Oct. 3, 2016) [hereinafter CARB telephone interview].

²⁹ Cal. Senate Bill 839, chap. 6.5(2)(c) (2016).

this would be included in the analysis.³⁰ As a first step, CARB is attempting to determine the source of natural gas consumed in the state at the regional level - the southwest, Rocky Mountain region, or western Canada - and will then, if feasible, seek to determine the specific fields that provide the natural gas and identify leakage rates for each field. This will be a potentially lengthy and expensive process for CARB as natural gas is not currently tracked in great detail.³¹ The CEC report in Senate Bill 839 will help CARB determine at what level it can accurately track the source of imported natural gas.³² According to CARB, it could take up to two years for CARB to complete the life-cycle GHG emission analysis.³³ It is important to note that there could be less detailed methodologies for estimating potential leakage from natural gas supply chains at a more aggregate level.

There are important differences between California's statutory obligations and the methane emissions assessment that has been discussed by the MCCC's mitigation working group and is a potential priority for the working group in 2017. In the mitigation working group, discussion has focused on whether and how the state should, in the near term, account for lifecycle methane emissions associated with electricity that is being consumed in Maryland, including lifecycle methane emissions related to electricity generated out-of-state but imported into Maryland. Methodology options that have been discussed include using an aggregate, national or regional methane emissions leakage factor from existing studies. In contrast, California's new statutes direct the state to measure lifecycle emissions produced in the state or imported into the state, but not necessarily emissions associated from out-of-state electricity generation. California's statutes also require a resource- and time-intensive approach to quantifying these lifecycle emissions at the level of the individual facility. Because of these differences in analysis scope and timeframe, California's approach may not be a good fit in the near term for Maryland. Nevertheless, the Commission may want to consider following or even collaborating on California's development of a more detailed assessment methodology in the medium-term, which could eventually lead to a more precise accounting of methane emissions.

B. Pennsylvania Climate Change Action Plan Update, Methane Accounting and Control Strategies

In August 2016, the Pennsylvania Department of Environmental Protection released its Climate Change Action Plan Update.³⁴ The revised plan is pursuant to the Pennsylvania Climate Change Act of 2008, which requires that the state update a plan every three years that measures GHG emissions against a baseline, identifies recommended climate strategies, and evaluates the costs and benefits of such strategies.³⁵ The plan is developed with advice of a Climate Change Advisory Committee that is composed of members appointed by the Governor and both houses of the legislature. The 2016 update finds that GHG emissions declined by 11 percent in

³⁰ CAL. HEALTH & SAFETY CODE § 39731(b).

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ 2015 Climate Change Action Plan Update, 3 (August 2016), <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-114163/FINAL%202015%20Climate%20Change%20Action%20Plan%20Update.pdf>. The plan was titled "2015" update even though it was issued in 2016.

³⁵ Pennsylvania Climate Change Act, Act 70 of 2008. The first Climate Change Action Plan was issued in 2009, and the second plan was issued in 2013. The next plan is due in 2018.

Pennsylvania between 2000 and 2012.³⁶ The update also includes emissions projections from 2015 to 2030, calculated using the EPA's Projection Tool, and projects a three percent increase in emissions from 2012 to 2030.³⁷

³⁶ 2000 is the base year used by Pennsylvania. Pennsylvania Department of Environmental Protection, 2015 Climate Change Action Plan Update, 3 (August 2016) <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-114163/FINAL%202015%20Climate%20Change%20Action%20Plan%20Update.pdf>.

³⁷ *Id.* at 31.

The plan includes 12 recommendations for the Pennsylvania legislature, including increasing the state's Alternative Energy Portfolio Standard, increasing investment in distributed solar generation, improving the state's energy efficiency programs under the current Act 129, and providing funding incentives for the construction of manure digesters.³⁸ The Action Plan also includes an evaluation of 13 work plans proposed by the Climate Change Advisory Committee based on the cost effectiveness of GHG emissions reductions.³⁹

Pennsylvania is an electricity exporting state, and therefore does not need to account for out-of-state emissions generated from combustion of electricity imported into the state as Maryland and other electricity importing states do. Pennsylvania is a major producer of natural gas used in the region for electricity production, and the Action Plan includes an assessment of methane emissions from gas and oil production and transmission facilities in the state. Pennsylvania used EPA's State Inventory Tool (SIT) for estimating emissions, relying on the default SIT emission factors.⁴⁰ The SIT methodology requires users to quantify production, processing, transmission (including storage), and distribution facilities in the state, and applies methane emissions factors for each facility type based on a 1996 study by the Gas Research Institute and the U.S. Environmental Protection Agency.⁴¹ Pennsylvania's update report finds that the state's GHG emissions from the oil and gas sector rose from 7 million metric tons of carbon dioxide equivalent (MMTCO₂e) in 2000 to 11 MMTCO₂e in 2012. Emissions from the sector are projected to be 15 MMTCO₂e in 2030.⁴² The update report also notes that the Pennsylvania emission inventory maybe missing emissions—particularly fugitive methane emissions from abandoned wells—citing a recent National Academy of Sciences report.⁴³

The 2016 update report notes the significant methane emissions from these industries and says that the state is “committed to curbing methane emissions from these sectors.”⁴⁴ The report includes a significant discussion of existing and future actions to regulate methane emissions from the oil and gas sector, building on a framework plan for addressing methane leakage released by Governor Tom Wolf in January 2016.⁴⁵ Pennsylvania has already implemented several important methane control requirements, including general operating permit requirements for wells and mid-stream compression stations that incorporate leak detection and repair (LDAR), and is planning to update these permitting requirements. The state is also currently in the process of establishing best practices for methane monitoring and LDAR for pipelines through its Pipeline Infrastructure Task Force.⁴⁶

The report notes several additional steps the Commonwealth could take to address emissions from the natural gas sector, including verifying producer emission data and using remote

³⁸ Pennsylvania 2015 Climate Change Action Plan Update at 144.

³⁹ The work plans are largely aligned with the legislative recommendations. Pennsylvania 2015 Climate Change Action Plan Update, 146.

⁴⁰ *Id.* at 22-23.

⁴¹ U.S. Environmental Protection Agency, User's Guide for Estimating Carbon Dioxide and Methane Emissions from Natural Gas and Oil Systems Using the State Inventory Tool 1.6 to 1.8 (2016), <https://www.epa.gov/statelocalclimate/download-state-inventory-and-projection-tool>.

⁴² Pennsylvania 2015 Climate Change Action Plan Update at 32.

⁴³ *Id.* at 47.

⁴⁴ *Id.* at 4.

⁴⁵ PA. DEP'T OF ENVTL. PROT., A PENNSYLVANIA FRAMEWORK OF ACTIONS FOR METHANE REDUCTIONS FROM THE OIL AND GAS SECTOR (2016), <http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Methane/DEP%20Methane%20Strategy%201-19-2016%20PDF.pdf>

⁴⁶ *Id.* at 43-47.

sensing technology to develop a comprehensive leakage emission inventory and updating regulatory programs based on this new data.⁴⁷ (See also section II.A. below on state strategies to reduce methane emissions).

The Maryland Commission on Climate Change may want to consider following or collaborating with Pennsylvania on its efforts to develop an improved assessment methodology for methane leakage from its natural gas supply and transmission system as part of its potential 2017 priority to support MDE efforts in enhancing GHG emissions inventory to include methane. In the medium term, such collaboration may be particularly valuable given that Pennsylvania is a major supplier of both natural gas and electricity from natural-gas fired generation for Maryland and the larger PJM region. Collaboration by Maryland and Pennsylvania on assessment methodologies could lay the foundation for a broader regional assessment of methane emissions and effective methane emission reduction strategies.

C. Massachusetts: *Kain v. DEP* and Response

1. *Massachusetts Global Warming Solutions Act and GHG Emissions Reporting*

Massachusetts' 2008 Global Warming Solutions Act (GWSA) requires the state to set binding GHG emission reduction targets for the state and establishes a framework for reporting on the state's compliance progress. The Act also required the state to establish GHG emissions reporting regulations and to develop a baseline emissions inventory.⁴⁸ In 2010, the state established a binding goal of achieving 25 percent reductions by 2020 from 1990 levels.⁴⁹

The Massachusetts Department of Environment Protection (MassDEP) issued regulations in December 2008 to set emissions reporting requirements and calculation methodology.⁵⁰ MassDEP publishes an annual GHG Reporting Program Summary Report; the 2015 Summary Report includes 296 facilities in the state that represent approximately 25 percent of the state's GHG emissions.⁵¹ As in Maryland and California, the state is required to report direct GHG emissions resulting from out-of-state generation of electricity imported into Massachusetts, and the state does this using a regional emission factor.⁵²

2. *Kain v. Department of Environmental Protection*

In May 2016, the Massachusetts Supreme Judicial Court in *Kain et al. v. Massachusetts Department of Environmental Protection (DEP)* found that the Global Warming Solutions Act requires the state to establish decreasing volumetric limits on GHG emissions and held that the state's existing policies and regulations do not meet this statutory requirement.⁵³ The

⁴⁷ *Id.* at 47.

⁴⁸ An Act Establishing the Global Warming Solutions Act, SB S2540 (2008); see Mass. Gen. Laws ch. 21N § 3(d).

⁴⁹ Massachusetts Executive Office of Energy and Environmental Affairs, 2015 Update, Massachusetts Clean Energy and Climate Plan for 2020 (2015), <http://www.mass.gov/eea/docs/eea/energy/cecp-for-2020.pdf>.

⁵⁰ State emissions are calculated using methodologies from The Climate Registry General Reporting Protocol. See 310 CMR 7.71.

⁵¹ MassDEP GHG Reporting Program Summary Report and Facility List Emissions Year 2015 at 2.

⁵² MassDEP, Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business As Usual Projection Update 12 (2016), <http://www.mass.gov/eea/docs/dep/air/climate/gwsa-update-16.pdf>.

⁵³ *Kain et al. v. Massachusetts Department of Environmental Protection (DEP)*, slip opinion at 2.

court ruled that the GWSA requires MassDEP to promulgate regulations addressing multiple sources of emissions and set annual declining, mass-based limits for those sources.⁵⁴

The state's existing regulatory programs, including its low emission vehicle (LEV) program, participation in the Regional Greenhouse Gas Initiative (RGGI), and sulfur hexafluoride regulations, were found to be insufficient to comply with the legislative mandate. The court found that the regulations promulgated for the state's compliance with the RGGI program—a carbon dioxide budget trading program and a declining emissions budget for the state—are not sufficient to comply with the GWSA because the regulations were issued pursuant to a separate statutory requirement and because the interstate trading of allowances would not ensure emissions reductions in Massachusetts.⁵⁵ The Massachusetts LEV program, which sets fleet-wide average emission requirements for automakers, does not meet the statutory requirement because it only requires a reduction in the rate of emissions from vehicles and does not ensure a decrease in aggregate emissions.⁵⁶ Similarly, the Massachusetts court determined that the state's rate-based sulfur hexafluoride regulations may not achieve the volumetric emissions reductions required by the statute.⁵⁷ Finally, the court found it compelling that the state enacted its LEV program and joined RGGI prior to the passage of the Global Warming Solutions Act, but the legislature “nonetheless directed the department to promulgate regulations in accord with new Statewide emissions limits.”⁵⁸

3. Integrated Climate Change Strategy for Massachusetts

In September 2016, Massachusetts Governor Charlie Baker issued Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth. The executive order directly responded to the *Kain* decision by requiring MassDEP to issue regulations by August 2017 that ensure the state meets the 2020 emissions limit and to consider emissions limits on sources such as natural gas distribution systems, new or renewed emission permits, and the transportation sector.⁵⁹ The executive order requires that proposed regulations be issued by December 16, 2016.

The Massachusetts Department of Environmental Protection (DEP) has announced that it will be holding a series of workshops in November to inform the development of these regulations.⁶⁰

In slides developed for these workshops, DEP indicates that it intends to propose an emissions cap for the transportation sector for 2020 that reflects estimated reductions from existing federal GHG regulations, the state's Zero Emission Vehicle program, and other state transportation requirements. These programs are estimated to achieve emission reductions of 3.2-4.1% between 2013-2020. DEP also indicates that the proposed regulation would require

⁵⁴ *Kain et al. v. Massachusetts Department of Environmental Protection (DEP)*, slip opinion at 6.

⁵⁵ *Kain et al. v. Massachusetts Department of Environmental Protection (DEP)*, slip opinion at 7-8.

⁵⁶ For example, aggregate emissions could increase despite a lower rate of emissions if the state saw a sufficient increase in vehicle-miles traveled. *Kain et al. v. Massachusetts Department of Environmental Protection (DEP)*, slip opinion at 8.

⁵⁷ *Kain et al. v. Massachusetts Department of Environmental Protection (DEP)*, slip opinion at 6-7.

⁵⁸ *Kain et al. v. Massachusetts Department of Environmental Protection (DEP)*, slip opinion at 8.

⁵⁹ Massachusetts Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth, 1-2 (September 16, 2016), <http://www.mass.gov/governor/legislationexecorder/execorders/executive-order-no-569.html>.

⁶⁰ Reducing GHG Emissions under Section 3(d) of the Global Warming Solutions Act (GWSA), Massachusetts Department of Environmental Protection, <http://www.mass.gov/eea/agencies/massdep/air/climate/section3d-comments.html>.

Massachusetts DOT to “calculate, report, and demonstrate reductions in aggregate CO₂ emissions from the transportation network each year from 2018 through 2020.”⁶¹ This would complement existing Massachusetts’ regulations that require the DOT to evaluate and track CO₂ emissions in regional transportation plans, transportation improvement programs, and state transportation improvement programs, which are federally required planning documents used to select transportation capital improvement projects.⁶²

DOT strategies identified for achieving these proposed targets include: ensuring GHG impacts are considered in expansion project selection to favor projects that reduce GHG emissions, investing heavily to restore and modernize Massachusetts’ transit system to support more low carbon trips, funding programs that specifically target low emissions transportation, and undertaking additional efforts with GHG benefits including EV fast charging infrastructure and removal of cash tolls.⁶³

As part of its efforts to meet the transportation-sector cap, DEP also intends to propose a new regulation that would set annual mass-based maximum CO₂ emission limits for state agency passenger vehicle fleets (not including transit vehicles). Non-passenger vehicles would not be subject to a cap, but would be required to report emissions. Regulated agencies would include the departments of transportation, public safety, environment, and health and human services, among others.⁶⁴

DEP also indicates that it intends to issue new regulations that would set a declining cap on methane emissions from the state’s natural gas distribution system, building on the state’s current requirement that natural gas distribution companies submit an annual plan to repair or replace aging or leaking natural gas infrastructure. According to slides developed for the public workshop, DEP intends to propose regulations that would set maximum annual methane emissions for each natural gas distributor and an aggregate cap that equals the individual caps. The emission caps would decline annually through 2034 or 2038.⁶⁵

Executive Order 569 also requires the Secretary of Energy and Environmental Affairs to expand existing programs and take a number of new actions related to climate, including:

- Establishing interim GHG emissions reduction targets for 2030 and 2040;
- Expanding on efforts to “lead by example” and reduce emissions from government operations;
- Work with “New England and Northeastern state transportation, environment and energy agencies to develop regional policies to reduce greenhouse gas emissions from the transportation sector,” the only sector where emissions in the state are increasing;
- Preparing a comprehensive energy plan;

⁶¹ Massachusetts Department of Environmental Protection, Slides for November 2, 2016 GWSA Regulations Stakeholder Meeting, Requirements for Transportation 6-10 (2016), <http://www.mass.gov/eea/docs/dep/air/climate/3-gwsa-transportation.pdf>.

⁶² 310 CMR 60.05.

⁶³ Massachusetts Department of Environmental Protection, Slides for November 2, 2016 GWSA Regulations Stakeholder Meeting, State Vehicle Fleet (2016), <http://www.mass.gov/eea/docs/dep/air/climate/3-gwsa-transportation.pdf>.

⁶⁴ Massachusetts Department of Environmental Protection, Slides for November 2, 2016 GWSA Regulations Stakeholder Meeting, Methane leaks from the natural gas distribution system 8 (2016), State vehicle fleet <http://www.mass.gov/eea/docs/dep/air/climate/4-gwsa-state-vehicles.pdf>

⁶⁵ Massachusetts Department of Environmental Protection, Slides for November 2, 2016 GWSA Regulations Stakeholder Meeting, Methane leaks from the natural gas distribution system 8 (2016), <http://www.mass.gov/eea/docs/dep/air/climate/5-gwsa-methane-leaks.pdf>.

- Coordinating efforts across Massachusetts to strengthen community resilience and prepare for the impacts of climate change.⁶⁶

Executive Order 569 also sets out a number of policy directives to increase the state's resilience to climate impacts, including publishing a climate adaptation plan and providing a framework and technical assistance to allow each town to assess its vulnerability to climate change.⁶⁷

⁶⁶ Massachusetts Executive Order 569 at 2-3.

⁶⁷ Massachusetts Executive Order 569 at 3-4.

The Maryland Commission on Climate Change may want to take note of how the state of Massachusetts is responding to the *Kain v. DEP* decision. In particular, the Commission may want to consider the ways in which Massachusetts is acting to set sector-specific declining annual GHG targets on the transportation and methane distribution sectors. The Commission may also want to consider the value of working regionally to develop policies to reduce greenhouse gas emissions from the transportation sector (see section II.D. below).

D. Virginia Executive Order on Power Sector Carbon Reduction Strategies

Virginia Governor Terry McAuliffe issued an Executive Order on June 28, 2016, directing the state's Secretary of Natural Resources to convene a workgroup to "study and recommend methods to reduce carbon emissions from electric power generation facilities." In the Executive Order, the Governor noted that while Virginia had already reduced carbon pollution from power plants by 21 percent between 2005 and 2014, emissions from the power sector still represent 30 percent of the commonwealth's carbon dioxide emissions and that the power sector was undergoing dramatic changes, reflecting both economic factors and federal regulations that will take effect in the future. Under the executive order, the workgroup is to consider the development of potential regulations under Virginia's existing laws, the requirements of the federal Clean Power Plan, and the interaction with regional electricity markets, including the PJM interconnection. The workgroup is directed to complete the development of recommendations on "viable carbon reductions methods" by April 30, 2017 and to present a report to the Governor by May 31, 2017.⁶⁸

E. Delaware Adopts Climate Framework

In early 2016 Delaware adopted its Climate Framework, which had been proposed in 2015 and included a goal of reducing GHG emissions 30 percent below 2008 levels by 2030.⁶⁹ The Climate Framework also provides recommendations for adapting to climate impacts in the state.

II. Strategies to Achieve Goals

Through discussions with officials in 10 states that are working to set or meet interim GHG emission goals, the Georgetown Climate Center identified four strategies that were of near-term interest to states seeking to further their policy responses to climate change. They were:

- Efforts to reduce methane emissions from the natural gas supply chain;
- Efforts to address equity and environmental justice issues as part of their climate and clean energy efforts;
- Efforts to align environmental climate strategies with "grid of the future" developments in the energy sector; and
- Regional opportunities to reduce transportation-sector emissions

⁶⁸ Virginia Executive Order 57, Development of Carbon Reduction Strategies for Electric Power Generation Facilities, (June 28, 2016), <https://governor.virginia.gov/media/6396/eo-57-development-of-carbon-reduction-strategies-for-electric-power-generation-facilities.pdf>.

⁶⁹ Statement of Delaware Staff, Georgetown Climate Center State Goal-Setting Workshop, May 4, 2016. Delaware Department of Natural Resources and Environmental Control, The Climate Framework for Delaware (2015), <http://www.dnrec.delaware.gov/energy/Pages/Climate-Framework.aspx>.

The following provides highlights of opportunities in each of these areas that the Maryland Commission on Climate Change or Maryland agencies may want to consider.

A. Strategies to Address Emissions from Methane

Methane is a short-lived, potent greenhouse gas, twenty-five times more powerful than carbon dioxide in causing climate change.⁷⁰ The largest source of methane emissions in the United States is the natural gas and oil sector, accounting for one-third of U.S. methane emissions.⁷¹ Recently, states, including Maryland,⁷² and the federal government have taken action to reduce methane emissions from the natural gas sector.

1. Federal Actions

At the federal level, the Environmental Protection Agency (EPA) has finalized new-source regulations and is beginning the process of developing existing-source regulations. In June 2016, EPA finalized regulations to reduce methane emissions from new and modified production and transmission sources in the oil and gas industry.⁷³ The new-source regulation controls methane emissions by requiring that certain pieces of equipment reduce methane emissions to a specified percentage (emission limitations),⁷⁴ mandating that certain pieces of equipment be replaced on an established schedule,⁷⁵ requiring the use of certain procedures to reduce emissions from the well site,⁷⁶ and requiring the use of a leak detection and repair (LDAR) program.⁷⁷ EPA has also announced its intention to develop regulations for methane emissions from existing sources in the natural gas sector.⁷⁸ As part of that process, EPA issued information collection request letters to oil and gas producers in November 2016 to help the

⁷⁰ *Overview of Greenhouse Gases*, ENVTL. PROT. AGENCY, <https://www3.epa.gov/climatechange/ghgemissions/gases/ch4.html> (last updated June 10, 2016) [hereinafter *Overview*].

⁷¹ *Id.*

⁷² MD. DEP'T OF THE ENV'T, OIL AND GAS EXPLORATION AND PRODUCTION, § 26.19.01, http://www.mde.state.md.us/programs/Land/mining/marcellus/Documents/261901_NPA_Complete_92316_4.pdf (2016) [hereinafter MD. OIL AND GAS PRODUCTION REGULATION].

⁷³ Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35,824, 35,825 (June 3, 2016) (to be codified at 40 C.F.R. pt. 60) [hereinafter EPA Methane Regulations]; Brendan K. Collins et al., *EPA Doubles Down on Methane Regulation for Oil and Gas Industry*, BALLARD SPAHR LLP (May 13, 2016), <http://www.ballardspahr.com/alertspublications/legalalerts/2016-05-13-epa-doubles-down-on-methane-regulation-for-oil-and-gas-industry.aspx>.

⁷⁴ EPA Methane Regulations, *supra* note 73, at 35,826.

⁷⁵ *Id.* at 35,844.

⁷⁶ *Id.* at 35,826, 35,845.

⁷⁷ *Id.* at 36,846.

⁷⁸ Gina McCarthy, *EPA Taking Steps to Cut Methane Emissions from Existing Oil and Gas Sources*, U.S. ENVTL. PROT. AGENCY (Mar. 10, 2016), <https://blog.epa.gov/blog/2016/03/epa-taking-steps-to-cut-methane-emissions-from-existing-oil-and-gas-sources/>.

agency collect the information it needs to develop existing-source regulations for the natural gas sector.⁷⁹

2. State Actions

States have also acted to regulate methane emission from new sources in the natural gas sector. Colorado,⁸⁰ Ohio,⁸¹ and Wyoming⁸² have finalized regulations for new sources of methane emissions within their states, while California,⁸³ Maryland,⁸⁴ and Pennsylvania⁸⁵ are in various stages of considering regulations. Maryland's regulation is similar to that of many of the states that are leading efforts to reduce methane emissions from new sources⁸⁶ in that Maryland's proposed regulation would require green completion⁸⁷ at new well sources and the use of "top-down best available technology" to control emissions.⁸⁸ Additionally, Maryland, as

⁷⁹ ENVTL. PROT. AGENCY, *Oil and Gas Industry Information Requests* <https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry/oil-and-gas-industry-information-requests> (last updated Nov. 28, 2016).

⁸⁰ Fact Sheet, Colo. Dep't of Pub. Health and Env't, Revisions to Colorado Air Quality Control Commission's Regulations Numbers 3, 6, and 7 (2014), https://www.colorado.gov/pacific/sites/default/files/AP_Regulation-3-6-7-FactSheet.pdf [hereinafter *Colorado Fact Sheet*].

⁸¹ Andrew Williams, *Ohio Gov. Kasich Moves to Reduce Environmental Impact of Natural Gas Industry*, ENVTL. DEF. FUND (Apr. 7, 2016), <http://blogs.edf.org/energyexchange/2016/04/07/ohio-gov-kasich-moves-to-reduce-environmental-impact-of-natural-gas-industry/>.

⁸² See generally Wyo. Air Quality Div, *Oil and Gas Production Facilities Chapter 6, Section 2 Permitting Guidance* (2013) [hereinafter *Wyo. Permitting Guidance*].

⁸³ See generally *Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities*, CAL. CODE. REGS. 17, § 95665-95676 (proposed May 31, 2016) [hereinafter *California Methane Regulations*].

⁸⁴ Md. Oil and Gas Production Regulation, *supra* note 72.

⁸⁵ Pa. Dep't of Env'tl. Prot., *A Pennsylvania Framework of Actions for Methane Reductions from the Oil and Gas Sector* (2016), <http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Methane/DEP%20Methane%20Strategy%201-19-2016%20PDF.pdf> [hereinafter *Pennsylvania Framework*].

⁸⁶ See 5 Colo. Code Regs. § 1001-9 XVII.B.2.d.(i), XVII.B.3.a, XVII.B.3.c; Wyo. Permitting Guidance, *supra* note 82, at 16, 22, 27; Pa. Dep't of Env'tl. Prot., App'x A: Comparison of Existing and Recommended Pennsylvania Permit Requirements to Standards of the Center for Sustainable Shale Development, Colorado and EPA's Proposed Standards to Reduce Methane and VOC Emissions for the Oil and Natural Gas Sector 4 (2015) <http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Methane/Appendix%20A%20-%20Comparison%20of%20PA-%20EPA%20NSPS%20Proposal-%20CSSD%20-%20CO%20Requirements%20for%20the%20Oil%20and%20Gas%20Sector%20%2012-15-2015.pdf> [hereinafter *PENN. COMPARISONS*].

⁸⁷ Green completion refers to processes for capturing methane and other vapors during cleanout and flowback operations in a newly-drilled well prior to the well being placed on production.

⁸⁸ Md. Oil and Gas Production Regulation, *supra* note 72, § 26.19.36.

is the case with all of these states, requires the use of a LDAR program to reduce methane emissions.⁸⁹

Maryland's regulation differs in several ways from some of these other regulatory approaches. First, the Maryland regulation is the only one that requires that flares burning gas at production facilities destroy 98 percent of the methane emitted.⁹⁰ Second, it is the only state that requires that natural gas producers purchase allowances to offset their methane emissions and provide documentation to its Department of the Environment of the purchase.⁹¹ All else being equal, these requirements could lead to overall reductions in GHG emissions.⁹²

Unlike Colorado, California, Wyoming, and Pennsylvania, the Maryland regulation does not use emissions limitations to reduce methane emissions by a specified percentage from certain pieces of equipment.⁹³ Maryland's LDAR program is also unusual in that it does not appear to include a schedule for inspecting for leaks and repairing discovered leaks and does not identify approved methods for leak inspection methods.

Maryland has only a few existing natural gas production facilities.⁹⁴ Two states with significant existing production facilities, Colorado and California, have both developed regulatory regimes to reduce methane emissions from existing in-state sources in the natural gas sector. Both regulations in Colorado and California include emissions limitations to reduce methane emissions from specific pieces of equipment⁹⁵ and require the use of certain emission control devices⁹⁶ and a LDAR program.⁹⁷ The most significant difference between the Colorado and

⁸⁹ California Methane Regulations, *supra* note 83, § 95669(g)-(i); 5 Colo. Code Regs. § 1001-9 XVII.F.3.c, tbl. 3, XVII.F.6.a-d, and XVII.F.7.a; MD. OIL AND GAS PRODUCTION REGULATION, *supra* note 72, § 26.19.39; OHIO ENVTL. PROT. AGENCY, HIGH VOLUME HORIZONTAL HYDRAULIC FRACTURING: OIL AND GAS WELL SITE PRODUCTION OPERATIONS GENERAL PERMIT 12.1 TEMPLATE § 5(c)(2)(c), 5(c)(2)(e)-(f) (2016) [hereinafter OHIO GENERAL PERMIT]; PENN. COMPARISONS, *supra* note 86, at 2, 6; WYO. PERMITTING GUIDANCE, *supra* note 82, at 22, 27. There are some differences in LDAR requirements. For example, the other state programs specify approved detection methods, set an inspection schedule, and set a schedule for repairing leaks, something that Maryland's proposed regulations do not do.

⁹⁰ Md. Oil and Gas Production Regulation, *supra* note 72, § 26.19.47.

⁹¹ Md. Oil and Gas Production Regulation, *supra* note 72, § 26.19.36.

⁹² As with any use of offset crediting programs, the success of the program in achieving emission reductions is heavily dependent on ensuring that the program implementation only permits crediting for offset projects that create real, verifiable, persistent, additional emission reductions.

⁹³ 5 Colo. Code Regs. § 1001-9 XVII.B.3.b, XVII.C.1.b, XVIII.C.2.a, XVII.D.3-4; California Methane Regulations, *supra* note 83, § 95668(b)-(c); Wyo. Permitting Guidance, *supra* note 82, at 7-10; Penn. Comparisons, *supra* note 86, at 3-4, 8.

⁹⁴ See Maryland, U.S. Energy Info. Admin., <https://www.eia.gov/state/analysis.cfm?sid=MD> (last updated July 21, 2016).

⁹⁵ 5 COLO. CODE REGS. § 1001-9 XVII.B.3.b, XVII.C.1.b; California Methane Regulations, *supra* note 83, § 95668(b)-(c).

⁹⁶ 5 COLO. CODE REGS. § XVII.B.2.d.(ii); California Methane Regulations, *supra* note 83, § 95668(e)(7).

⁹⁷ 5 Colo. Code Regs. § 1001-9 XVII.F.3.c, tbl. 3; XVII.F.4.c, tbl. 4; XVII.F.6.a-d, and XVII.F.7.a; California Methane Regulations, *supra* note 83, § 95669(g)-(i).

California existing source regulations is that Colorado phased in its requirements for emission control devices and LDAR program.⁹⁸

States have also sought to reduce methane emissions from their natural gas distribution networks which transport natural gas from the interstate transmission pipelines to the final residential, commercial, or industrial consumers of the natural gas intrastate.⁹⁹ Maryland has a statutory provision that encourages natural gas distribution companies to undertake repairs to its distribution infrastructure in order to reduce greenhouse gas emissions by allowing the companies to recover up to \$2 per month from each residential customer and a similar amount from non-residential customers in order to pay for these improvements.¹⁰⁰ In contrast, other states require action to repair leaks or reduce the methane leakage rate. A Massachusetts statute requires the Department of Public Utilities to repair non-hazardous natural gas leaks, which traditionally have not been prioritized for speedy repair, if the leak has a “significant environmental impact.”¹⁰¹ In Pennsylvania, a 2014 Public Utility Commission regulation requires each natural gas distributor to reduce to 5 percent the level of unaccounted-for natural gas the first year after submitting a request for a rate payment, and in each subsequent year reduce the level of unaccounted-for natural gas 0.5 percent until it reaches 3 percent.¹⁰²

In general, Maryland has proposed new-source methane regulations that would be consistent with those of other states that have been leaders on this issue. There are a few areas in which the Maryland Commission on Climate Change may want to consider recommendations to enhance proposed new-source regulations:

- Regulations could include emissions limitations for specific pieces of equipment; and
- Maryland could provide more explicit guidance for the LDAR requirements, including what mechanisms would be approved for detecting leaks and establishing schedules that would be required for inspecting and repairing leaks.

Finally, the MCCC may also want to consider recommendations to enhance Maryland’s program for reducing emissions from natural gas distribution systems. For example, the Maryland Public Service Commission could require distribution companies to take action to repair leaks or reduce the methane emission leakage rate from the state’s natural gas distribution infrastructure.

B. Strategies to Integrate Equity into State Climate Actions

Several states, including Maryland, have indicated interest in understanding how states can engage with stakeholders around environmental justice issues and address environmental justice impacts as part of their climate policies. As part of its potential priorities for 2017, the mitigation working group indicated an interest in a continued partnership with the Commission on Environmental Justice and Sustainable Communities to identify and conduct outreach meetings and listening sessions with environmental justice and underserved

⁹⁸ 5 Colo. Code Regs. § 1001-9 XVII.B.2.d.(ii); 5 Colo. Code Regs. § 1001-9 XVII.F.3, tbl. 3, XVII.F.4, tbl. 4.

⁹⁹ Steven Levine et al., *Understanding Natural Gas Markets* 4 (2014).

¹⁰⁰ Md. Code, Pub. Util. § 4-210(a) (2016).

¹⁰¹ 2016 Mass Acts. Ch. 188, § 13.

¹⁰² Pa. Code § 59.111(a), (c)(1) (2016).

communities.¹⁰³ The mitigation working group is also considering identifying existing and prospective GHG reduction programs and policies that may or have negative impacts on fossil-fuel dependent workers and communities in Maryland as part of its 2017 work plan.¹⁰⁴

In the context of climate policy, environmental justice considerations may include: whether vulnerable and disadvantaged communities have access to the policymaking process; whether policies are benefitting communities equitably; and whether policies may lead to environmental outcomes that disparately harm certain communities.

The 2015 Report of the Maryland Commission on Climate Change included recommendations that Maryland's 2030 climate objective incorporate equity goals, including:

- The degree to which climate action strategies, policies and programs produce economic benefits that are equitably distributed across Maryland's population;
- The degree to which climate action strategies, policies and programs produce economic benefits that are sustainable;
- The degree to which climate change strategies, policies and programs effectively address the economic dislocations that they may cause;
- The degree to which climate action strategies, policies and programs produce public health benefits;
- The degree to which climate action strategies, policies and programs reduce energy burdens in low-income households; and
- The degree to which climate action strategies, policies and programs improve resilience in vulnerable communities.¹⁰⁵

Addressing these types of environmental justice issues in the context of climate change mitigation is a relatively new area, but there are several examples of state and federal action that can inform state responses on this issue.

1. Background: Federal Action

In 1994, President Clinton issued Executive Order (EO) 12898, "Federal Actions to Ensure Environmental Justice in Minority Populations and Low-Income Populations." This was the first major federal action on environmental justice in the United States. EO 12898 mandates that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations."¹⁰⁶

In 2010 the Obama Administration launched a major new environmental justice initiative with the Interagency Working Group (IWG).¹⁰⁷ In 2011, IWG agencies adopted a charter and signed a Memorandum of Understanding on Environmental Justice and Executive Order 12898

¹⁰³ 2017 POTENTIAL PRIORITIES, *supra* note 6.

¹⁰⁴ *Id.*

¹⁰⁵ Maryland Commission on Climate Change Report, 2015 Report to Governor Larry Hogan 28 (2015), <http://www.mde.state.md.us/programs/Marylander/Documents/MCCC/Publications/Reports/MCCC2015FinalReport.pdf>.

¹⁰⁶ Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, <http://www.archives.gov/federal-register/executive-orders/pdf/12898.pdf>

¹⁰⁷ EPA, Federal Interagency Working Group on Environmental Justice (EJ IWG), <https://www.epa.gov/environmentaljustice/federal-interagency-working-group-environmental-justice-ej-iwg>.

(MOU).¹⁰⁸ The MOU served as a formal agreement among Federal agencies to recommit to addressing EJ through a more collaborative, comprehensive and efficient process. The Charter outlines the governance structure and focus areas for the EJ IWG and was revised in late 2014. During this revision, “Impacts from Climate Change” became a focus area.¹⁰⁹

The EPA has also been developing EJ “action agendas” that lay out strategic plans for implementing the agencies’ EJ goals for upcoming years. In October 2016, the EPA released the EJ 2020 action agenda, the U.S. Environmental Protection Agency’s strategic plan for environmental justice for 2016-2020. The goals for EJ 2020 include:

- Deepening environmental justice practice within EPA programs to improve the health and environment of overburdened communities, focusing on rulemaking, permitting, compliance and enforcement, and science; and
- Working with partners to expand positive impact within overburdened communities, with a focus that includes states and local Governments and community-based work.

2. Examples of State Strategies to Address Equity Issues

State Executive Orders, Goals, Plans, and Advisory Groups. Similar to the federal executive order, now all 50 states have some kind of formal commitment to address environmental justice. Recently, several states have developed environmental justice implementation plans, often developed with input from EJ advisory groups. For example, Minnesota recently completed a 2015-2018 Environmental Justice Framework.¹¹⁰ Other prominent plans include New York’s and California’s policies on environmental justice.¹¹¹

Approaches to identifying/defining EJ communities. One frequent challenge posed in environmental justice analysis is how to identify EJ communities. Most states have definitions of EJ communities, which typically identify demographic factors that should be taken into account when identifying communities disparately affected by pollution or benefits of environmental programs. The federal government and a number of states are experimenting with quantitative tools to identify EJ communities and disparate impacts. For example, California has developed CalEnviroScreen 2.0, an online mapping tool that uses 19 indicators to quantify pollution and population vulnerability for each of the 8,000 census tracts. The indicators fall into 2 groups: population characteristics and pollution burden.¹¹² In October 2014, CalEPA designated the census tracts with the top 25 percent CalEnviroScreen scores as disadvantaged communities.¹¹³ The federal EPA has similarly developed an online tool, EJ

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ Environmental Justice Framework 2015-2018, available at: <https://www.pca.state.mn.us/sites/default/files/p-gen5-05.pdf>

¹¹¹ <http://www.dec.ny.gov/public/333.html>

¹¹² Population characteristics including sensitivity to pollution and socioeconomic factors; pollution burden includes exposure to pollutants and environmental effects indicators.

¹¹³ CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, DESIGNATION OF DISADVANTAGED COMMUNITIES PURSUANT TO SENATE BILL 535 (De León) 14 (2014), <http://www.calepa.ca.gov/EnvJustice/GHGInvest/Documents/SB535DesCom.pdf> (last visited May 2, 2016).

Screen, that can be used to map pollution impacts and demographic characteristics of different communities.¹¹⁴

Designing inclusive public processes. A key element of addressing environmental justice issues in state climate action is to design inclusive public processes. Important public engagement practices identified by states in this area through Georgetown’s workshop and research include holding public meetings on nights and weekends; providing interpreters; investing in a sustained, broad-based engagement process with transparency, milestones, and reporting on progress; developing meeting agendas that provide time for community members to identify issues of importance to them and issue spot; and developing accessible background materials and presentations. One public process that has been noted as a good model of a sustained public engagement process is South Carolina’s engagement with EJ communities on energy issues.¹¹⁵

Programs designed to promote equitable benefits of clean energy and climate actions. California has designed climate and clean energy programs that specifically aim to provide benefits to disadvantaged communities. Senate Bill 535 (SB 535), passed in 2012, calls for CalEPA to identify “disadvantaged communities,” and requires at least 25 percent of the proceeds from its cap-and-trade auctions to be expended in a manner benefiting disadvantaged communities.¹¹⁶ Among the programs that California uses to direct funds into disadvantaged communities is the low-income weatherization program (LIWP). The program not only requires that 100 percent of received funds benefit disadvantaged communities,¹¹⁷ but also enables cost-effective energy efficiency (weatherization) measures and solar photovoltaics to help qualifying low-income households reduce energy use and GHG emissions. California also has a suite of transportation investments designed to benefit low-income residents and disadvantaged communities, including a Clean Vehicle Rebate Project with a level of benefit based on residents’ income;¹¹⁸ a “cash-for-clunkers” program that provides incentives to low-income residents for the replacement of old, inefficient vehicles;¹¹⁹ a public fleets program that provides incentives to local governments in disadvantaged communities to purchase new, clean fleet vehicles;¹²⁰ and car sharing and shared mobility pilot project programs.¹²¹

Programs designed to mitigate potential disparate impacts of climate actions. EJ stakeholders have voiced concerns that greenhouse gas reduction programs that include emission trading may lead to increases of conventional local pollutants—like ozone, nitrogen

¹¹⁴ EPA, *What is EJSCREEN?*, June 9, 2015, <https://www.epa.gov/ejscreen/what-ejscreen>.

¹¹⁵ <http://www.scdhec.gov/environment/environmentaljustice/>

¹¹⁶ CAL. HEALTH & SAFETY CODE § 39711 (West 2014) and CAL. Health & SAFETY CODE § 38565 (West 2013). (It also requires that 10% of the funds be expended to projects within disadvantaged communities.)

¹¹⁷ CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL JUSTICE ACTION PLAN (2004), <http://www.calepa.ca.gov/EnvJustice/Resources> (last visited Mar. 21, 2016);

¹¹⁸ See California Air Resources Board, *Clean Vehicle Rebate Project*, ARB.CA.GOV, <http://www.arb.ca.gov/msprog/aqip/cvrp.htm> (last visited Mar.22, 2016).

¹¹⁹ See CALIFORNIA AIR RESOURCES BOARD, MAKING THE CLEANEST CARS AFFORDABLE (2015), http://www.arb.ca.gov/msprog/aqip/ldv_pilots/efmp_plus_up_faq.pdf (last visited Mar. 22, 2016).

¹²⁰ California Air Resources Board, *Public Fleet Pilot Project*, <https://cleanvehiclerebate.org/eng/pfp> (last visited Mar. 22, 2016).

¹²¹ California Air Resources Board, *Low Carbon Transportation Light-Duty Project Projects that Benefit Disadvantaged Communities*, ARB.CA.GOV, http://www.arb.ca.gov/msprog/aqip/ldv_pilots.htm (last visited Mar.22, 2016).

dioxide, and mercury—in areas that already have a disproportionate share of air pollution. California has sought to address this concern by developing an “adaptive management plan.”¹²² Under the plan, California uses its existing criteria-pollutant monitoring network to assess whether criteria pollution from units covered by the cap-and-trade program increases in any locations. If increases occur, the Air Resources Board is to analyze whether the increases are due to participation in California’s cap-and-trade program, or for other reasons. Should the increases be determined to be caused by the cap-and-trade program, then the agency would develop responses to mitigate the increase through a public process.

C. Strategies to Align Grid of the Future Planning with State Climate Goals and Actions

Several state public utility commissions have initiated proceedings to consider how to address changes taking place in the electricity system, including the rapid growth of distributed renewable energy and other distributed energy resources, increases in demand-side energy efficiency deployment (including through smart appliances), the emergence of energy storage, increased deployment of electric vehicles, interest in microgrids, and the needs to decarbonize the grid and prepare for the impacts of climate change.

One of the first of these comprehensive “grid of the future” efforts is the New York State Public Service Commission’s (PSC) Reforming the Energy Vision (REV) process, which aims to align electric utility practices and the regulatory regime to achieve improvements in system efficiency, greater customer choice, and greater penetration of clean generation and energy efficiency technologies.¹²³ The Hawaii Public Utilities Commission¹²⁴ and Minnesota Public Utilities Commission¹²⁵ have both instituted similar “grid of the future” proceedings.

In September 2016, the Maryland Public Service Commission (MD PSC) also initiated a targeted review to ensure that electric distribution systems in Maryland are “customer-centered, affordable, reliable and environmentally sustainable.”¹²⁶ The proceeding follows up on a condition of the Exelon-Pepco merger, which required Exelon to file a plan for transforming its distribution system and fund a consultant to the Commission on the matter.¹²⁷ MD PSC has identified the following as topics for the proceeding: rate design; benefits and costs of distributed energy resources (DER); advanced metering infrastructure; energy storage; development of competitive, efficient, and predictable DER markets that maximize customer choice; distributed system planning to ensure increased DER penetration; and evaluating the impact of the evolving electric distribution system on Marylanders with limited means.¹²⁸

¹²² See California Air Resources Board, *Adaptive Management—Localized Air Quality Impacts*, ARB.CA.GOV, <http://www.arb.ca.gov/cc/capandtrade/adaptivemanagement/adaptivemanagement.htm> (last visited May 2, 2016).

¹²³ N.Y. Pub. Serv. Comm., Order Instituting Proceeding on Reforming the Energy Vision, Case 14-M-0101, 2 (Apr. 25, 2014).

¹²⁴ Haw. Pub. Utils. Comm., Instituting a Proceeding to Investigate Distributed Energy Resource Policies, Order. No. 32269, 1 (Aug. 21, 2014).

¹²⁵ MN. PUB. UTILS. COMM., BUILDING A MINNESOTA CONVERSATION ON GRID MODERNIZATION WITH A FOCUS ON DISTRIBUTION SYSTEMS (2015).

¹²⁶ Md. Pub. Serv. Comm., In the Matter of Transforming Maryland’s Electric Distribution Systems to Ensure that Electric Service is Customer-Centered Affordable, Reliable and Environmentally Sustainable in Maryland, Public Conference 44, 1 (Sept. 26, 2016).

¹²⁷ *Id.* at 1-2.

¹²⁸ *Id.* at 2-3.

State agency staff identified alignment with grid-of-the-future PUC proceedings as one of the strategies of interest for helping states meet interim climate goals. Through workshop discussions, one of the key points that emerged was that state environmental agencies can offer meaningful input to these proceedings.

Utility commissions have historically been narrowly focused on “just and reasonable rates” and “no undue discrimination.” As noted by one of the utility regulation experts participating in the workshop, the consideration of grid-of-the-future issues raises broader questions on which PUCs can benefit from environmental agency input, especially given that these grid of the future proceedings often explicitly incorporate climate mitigation and adaptation or resilience as issues to be addressed.

Some state environmental agencies already provide formal comments to the Utility Commission processes, including Connecticut and New York. One example of comments comes from the New York State Department of Environmental Conservation (NYSDEC), which has been actively involved in the NY REV process. NYSDEC’s comments can illustrate the types of issues that state environmental agencies may want to consider addressing.

NYSDEC’s comments to the New York State Public Service Commission included the following:¹²⁹

- Urging the PSC to adopt GHG reduction as a principle goal of the REV process, and suggestions for how that goal be articulated;
- Urging the PSC to evaluate REV objectives on multiple metrics, and not solely using a benefit cost-analysis given the challenge of applying monetary values to some environmental and public health objectives;
- Recommending how the PSC should value carbon and criteria pollutant reductions if it chooses to use a benefit-cost framework;
- Recommending how to align proposed new programs for distributed renewable generators with existing state climate programs;
- Recommending how REV policies could be aligned with criteria pollution control obligations, for example by developing market structures for distributed energy resources that can help the state meet National Ambient Air Quality Standards for particulate matter or by developing policies to reduce electricity demand on peak usage days that can reduce ozone pollution;
- Recommending consideration of climate change impacts in projecting future electricity demand (for example taking into account projected increases in air conditioning use due to higher temperatures);
- Encouraging the PSC to apply NYSDEC’s environmental justice policy in the REV process;
- Urging the Commission to require utilities to submit energy efficiency transition implementation plans to ensure that utilities are properly planning and budgeting for efficiency investments; and

¹²⁹ See Letter from New York State Department of Environmental Conservation to the Honorable Kathleen H. Burgess, Secretary to the Commission, New York State Public Service Commission (July 18, 2014); Letter from New York State Department of Environmental Conservation to the Honorable Kathleen H. Burgess, Secretary to the Commission, New York State Public Service Commission (Sept. 22, 2014); Letter from New York State Department of Environmental Conservation to the Honorable Kathleen H. Burgess, Secretary to the Commission, New York State Public Service Commission (May 1, 2015); Letter from New York State Department of Environmental Conservation to the Honorable Kathleen H. Burgess, Secretary to the Commission, New York State Public Service Commission (Aug. 21, 2015).

- Commenting on how to integrate microgrids into the REV process in a way that ensures that they are not an unregulated loophole for small but carbon-intensive generating facilities that would be otherwise unregulated, while also recognizing that microgrids are “essential to climate change resiliency and they have a significant importance for minority and low income communities, especially to ensure reliable service to hospitals and other critical facilities”

D. Regional Opportunities Related to Transportation

States in the northeast and mid-Atlantic—including Maryland—are working together through the Transportation and Climate Initiative to reduce emissions from the transportation sector, which is facilitated by the Georgetown Climate Center. This is particularly important given that transportation is the largest source of GHG emissions in the region. Several opportunities for acting regionally to reduce transportation-sector emissions may be of interest to the Commission. These efforts include collaborating on regional electric vehicle infrastructure and the regional exploration of clean transportation funding and financing options.

Recognizing that a broad network of EV charging infrastructure is needed to support national EV adoption and solve the “chicken-and-egg” problem of vehicle adoption and charging infrastructure investment,¹³⁰ the U.S. Department of Transportation announced in July 2016 a process to designate alternative fuel corridors as required by the Fixing America’s Surface Transportation (FAST) Act¹³¹ transportation reauthorization.¹³² All twelve TCI jurisdictions, including Maryland, submitted nominations for corridors in the region either individually or through multi-state nominations, and agencies from all twelve jurisdictions endorsed a joint letter of support for the corridor nominations. On November 3, FHWA announced the designation of eight major EV corridors in the TCI region, including I-95, I-70, I-270, and U.S. 50 in Maryland.¹³³ The U.S. Department of Transportation and other federal agencies will provide technical assistance and analytical support to promote charging infrastructure, which may provide opportunities for additional collaboration in the TCI region through multi-state network and corridor planning.

States are also engaging in regional discussions of opportunities to provide additional funding for clean transportation infrastructure. One significant source of funding will come from the recently finalized Volkswagen (VW) settlement related to VW’s installation of “defeat devices” in turbocharged direct-injection (TDI) diesel engine vehicles. On October 25, 2016, Volkswagen obtained final court approval for the 2.0L TDI settlement.¹³⁴ In addition to

¹³⁰ There is not a viable business case for widespread investment in vehicle charging infrastructure until there is significant vehicle adoption. However, widespread consumer adoption may not occur until sufficient charging infrastructure is available.

¹³¹ Section 1413 of the Fixing America’s Surface Transportation (FAST) Act requires the U.S. Department of Transportation to designate alternative fuel charging corridors for electric vehicles, Hydrogen, propane, and natural gas by December 2016. Fixing America’s Surface Transportation, Pub. L. 114-94.

¹³² Fixing America’s Surface Transportation Act-Designation of Alternative Fuel Corridors, 81 FR 47850 (July 22, 2016); see FACT SHEET: Obama Administration Announces Federal and Private Sector Actions to Accelerate Electric Vehicle Adoption in the United States (July 21, 2016) <https://www.whitehouse.gov/the-press-office/2016/07/21/fact-sheet-obama-administration-announces-federal-and-private-sector>

¹³³ Georgetown Climate Center, Transportation and Climate Initiative States Receive Electric Vehicle Corridor Designation, <http://www.georgetownclimate.org/articles/transportation-and-climate-initiative-states-receive-electric-vehicle-corridor-designation.html>.

¹³⁴ In re: Volkswagen “Clean Diesel” Marketing, Sales Practices, and Products Liability Litigation, MDL No. 2672 CRB (N.D. Cal. 2016).

consumer buybacks (or potential retrofits), the settlement includes two significant sources of funding to reduce transportation-sector emissions: a ZEV Investment Commitment and a Mitigation Trust Fund. The ZEV Investment Commitment requires VW to spend \$2 billion over 10 years to develop, build, and maintain zero-emission vehicle (ZEV) charging infrastructure throughout the country¹³⁵ The investments will be made pursuant to a National ZEV Investment Plan approved by the U.S. EPA and California Air Resources Board—with input from states— and will include the installation of EV charging equipment and brand-neutral public awareness campaigns to promote electric vehicles. The Mitigation Trust Fund includes \$2.7 billion in payments to state and tribal government to fund projects that reduce nitrogen oxide (NOx) emissions.¹³⁶ Eligible projects include vehicle repowering, including for freight trucks, school buses, ferries, and port vehicles, and Diesel Emission Reduction Act matching funds. Additionally, each state or tribal beneficiary may use up to 15 percent of the allocated funding for investments in EV charging equipment.¹³⁷ The VW settlement funding may provide an opportunity to use these funds to further develop regional electric vehicle transportation infrastructure, especially to fill gaps on federally designated corridors or otherwise support strategic infrastructure investments to support high-EV deployment throughout the region.

Funding and financing of clean transportation is also a primary focus of state discussions through the Transportation and Climate Initiative. Many states in the region are reviewing the role of electric utilities in transportation electrification. Georgetown Climate Center has supported TCI states through the development of legal and policy resources to inform state regulation of electric vehicle charging, including case studies of utility EV infrastructure investment pilot programs¹³⁸ and an issue brief analyzing utility rate structures that reduce the disincentive of demand charges for DC Fast Charger host sites.¹³⁹

¹³⁵ In re: Volkswagen “Clean Diesel”, Appendix C: The ZEV Investment Commitment

¹³⁶ In re: Volkswagen “Clean Diesel”, Appendix D: Form of Environmental Mitigation Trust Agreement

¹³⁷ In re: Volkswagen “Clean Diesel”, Appendix D: Form of Environmental Mitigation Trust Agreement

¹³⁸ Georgetown Climate Center, Electric Vehicle Workplace Charging: Case Studies of Utility Investment Pilot Programs (forthcoming, 2016).

¹³⁹ Georgetown Climate Center, Utility Rate Design and Technology Solutions to Reduce Demand Charges from DC Fast Charging, (forthcoming, 2016).

III. Conclusion

This memorandum summarized recent developments related to state GHG goal setting and highlighted potential examples in four climate strategies for which the Commission or Maryland state agencies may want to consider additional action.

California and Pennsylvania are considering how to better account for lifecycle emissions from the natural gas supply chain, actions that can potentially inform Maryland's own discussions about how to account for methane emissions from the natural gas supply chain. Massachusetts is taking action to establish GHG reduction requirements for the transportation sector and natural gas distribution sector, and will also be collaborating regionally on transportation-sector emission reductions, strategies that Maryland may also want to consider.

The Commission may also want to consider: recommending setting methane emission limits for specific pieces of equipment in the natural gas supply chain and establishing leak detection and repair schedules as part of Maryland's regulations for new natural gas facilities; examples of how other states have incorporated equity issues into climate actions; examples of how other state environmental agencies have incorporated climate issues into public utility commission grid-of-the-future proceedings; and opportunities to work through TCI to expand regional electric vehicle infrastructure.

IV. Appendix: Additional Information about the Georgetown Climate Center and Work to Inform the MCCC Process

GCC has provided support to Maryland state agencies in a number of capacities, including:

- Participating in Maryland Commission on Climate Change mitigation work group meetings, and submitting a memorandum to the Commission in 2015 that focused on issues relating to the evaluation of Maryland's progress towards its 2020 goal with regard to fuel switching in the power sector, projected changes in vehicle miles traveled, and future growth of electric vehicles. The memorandum also provided an overview of other states that have set emission reduction goals for years between 2025 and 2035, and identified potential additional emission reduction policies that could achieve reductions in future years.¹⁴⁰
- Serving as the facilitator of the Transportation and Climate Initiative, a collaboration of the transportation, energy, and environment agencies of 11 northeast states and the District of Columbia—including Maryland—that seeks to develop the clean energy economy and reduce greenhouse gas emissions (GHG) in the transportation sector.¹⁴¹
- Facilitating ongoing dialogues of states—including Maryland—and other stakeholders to further understanding and analysis of state compliance options under the federal Clean Power Plan, which sets carbon pollution emission guidelines for existing power plants.¹⁴²
- Working with Maryland state agencies and jurisdictions to inform development of policies that strengthen resilience and help prepare communities for the impacts of climate change.¹⁴³

The Climate Center is also funded by the Town Creek Foundation to serve as a resource to the MCCC.¹⁴⁴

This memorandum is based on facilitation and research that the Georgetown Climate Center has conducted to help inform Maryland and other states that are setting mid-term goals, implementing policies to meet those goals, and tracking their progress. This work has included the following:

- One-on-one discussions with state staff in 12 states that have set or are in the process of setting mid-term goals, or are working on related GHG reduction strategies.
- Hosting a workshop on May 4, 2016, for representatives of nine states that have established or are in the process of establishing mid-term goals at the University of Maryland College Park. A public session of the workshop was held as part of the 2016 Climate Action Forum.

¹⁴⁰ Georgetown Climate Center Memorandum to Maryland Commission on Climate Change (2015).

¹⁴¹ Transportation and Climate Initiative, <http://www.transportationandclimate.org/>.

¹⁴² See Georgetown Climate Center, Working with Stakeholders to Inform Federal Standards to Reduce Carbon Pollution, <http://www.georgetownclimate.org/node/5683>.

¹⁴³ GCC submitted a separate memorandum on adaptation strategies.

¹⁴⁴ See Briefing letter from Stuart Clarke to Members of the Steering Committee of the Maryland Climate Change Commission, April 22, 2015, http://www.mde.state.md.us/programs/Marylander/Documents/Attachment_2_Outside_Resource_Memo_for_4.23_MCCC_Steering_Committee_Meeting.pdf.

- Participation in meetings of the Maryland Commission on Climate Change mitigation work group.
- Research into specific areas of focus, including conversations with multiple experts and stakeholders in the areas of methane emission reduction, addressing equity, and grid of the future. The research was also supported by student research as a part of a Climate Change practicum class at Georgetown Law.