

**PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**RECOMMENDATION**

**TO THE PENNSYLVANIA ENVIRONMENTAL QUALITY BOARD**

**ON THE ASHLEY FUNK PETITION FOR RULEMAKING**

**TO REDUCE CARBON DIOXIDE EMISSIONS**

**JULY 31, 2014**

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## **A. DESCRIPTION OF THE PETITION FOR RULEMAKING PROCEDURE**

Under 25 Pa. Code Chapter 23, the Environmental Quality Board (“EQB”) developed a policy for processing petitions for rulemaking (relating to Policy for Processing Petitions – Statement of Policy). *See also* 71 P.S. § 510-20(h) (Any person may petition the EQB to initiate a rulemaking proceeding for the issuance, amendment, or repeal of a regulation administered and enforced by the department). Among other things, a petition for rulemaking must contain the following information: (1) the petitioner’s name, address, and telephone number; (2) a description of the action requested including suggested regulatory language if the petition requests the EQB to adopt or amend regulations; (3) the reason the petitioner is requesting the action from the EQB; and (4) the types of persons, businesses and organizations likely to be impacted by the proposal. 25 Pa. Code § 23.1 (relating to Petitions).

When a petition for rulemaking is submitted, the Pennsylvania Department of Environmental Protection (“Department” or “DEP”) examines the petition before it is submitted to the EQB to determine if it meets the following conditions: (1) the petition is complete as required by § 23.1; (2) the petition requests an action that can be taken by the EQB; and (3) the requested action does not conflict with federal law. 25 Pa. Code § 23.2 (relating to Departmental review).

The Department then notifies the EQB and the petitioner of its determination. If the Department determines that the petition is not appropriate, the notification will state why and give the petitioner 30 days to modify the request. 25 Pa. Code § 23.3 (relating to Notifications).

Where the Department determines that a petition is appropriate, the petitioner may make a five-minute presentation to the EQB. The Department may also make a recommendation as to whether to accept the petition. 25 Pa. Code § 23.4 (relating to Oral presentations).

The EQB may refuse to accept a petition if: (1) the EQB has within the past two years considered the issue addressed in the petition; (2) the action requested by the petitioner is currently under litigation; (3) the requested action is inappropriate for policy or regulatory considerations; or (4) the petition involves an issue previously considered by the EQB, and it does not contain information that is new or sufficiently different to warrant reconsideration of that issue. 25 Pa. Code § 23.5 (relating to Board determinations).

If the EQB accepts the petition, a notice of acceptance will be published in the *Pennsylvania Bulletin* and a report will be prepared. 25 Pa. Code § 23.6 (relating to Notice of acceptance and Department report).

Once the report is completed, the Department will send a copy of it to the petitioner who may then submit to the Department a written response to the report within 30 days of the mailing of the report. 25 Pa. Code § 23.7 (relating to Response to report).

The Department will prepare a recommendation to the EQB based on the report and comments received from the petitioner. If regulatory amendments are recommended, the Department will develop a proposed rulemaking for EQB consideration within 6 months after the Department mailed its report to the petitioner. If regulatory amendments are not recommended, the Department will present its recommendation and basis to the EQB at the first meeting occurring at least 45 days after the Department mailed its report to the petitioner. 25 Pa. Code § 23.8 (relating to Board consideration).

## **B. SUMMARY DESCRIPTION OF THE ASHLEY FUNK PETITION FOR RULEMAKING**

### **1. Procedural Description**

On September 6, 2013, the Department received a petition to promulgate a rule “to regulate fossil fuel carbon dioxide (“CO<sub>2</sub>”) emissions and to establish an effective emissions reduction strategy that will achieve safe atmospheric concentrations of CO<sub>2</sub> by 2100.” (“Petition for Rulemaking” or “Petition”) (*See Exhibit 1*).

The Petition was submitted by Kenneth T. Kristil, Esq., Widener Environmental and Natural Resources Law Clinic, 4601 Concord Pike, Wilmington, DE, 19803, on behalf of Ashley Funk, (“Petitioner”) 330 Black Street, Mount Pleasant, PA, 15666.

On October 10, 2013, the Department sent a letter to Ms. Funk that notified her that the Petition for Rulemaking met the established criteria in Section 23.2 of the EQB’s petition policy. The letter also set November 19, 2013, as the date the EQB would consider the Petition.

At the November 19, 2013, EQB meeting, Attorney Kristil, representing Ms. Funk, made a brief presentation as to why the EQB should accept the Petition for Rulemaking for further study. The Department recommended that the EQB accept the Petition for further study. The EQB voted unanimously to accept the Petition for further study.

On December 7, 2013, the Department published a notice of acceptance of the Petition for Rulemaking in the *Pennsylvania Bulletin*. 43 Pa. Bull. 7095.

On April 15, 2014, the Department sent the evaluation report of the Petition to the Petitioner, which recommended that the Petition be denied.

On May 30, 2014, the Petitioner submitted its reply to the Department report, (“Petitioner’s Reply” or “Reply”) which recommended that the EQB reject the Department’s

recommendation and order the Department to develop and promulgate regulations consistent with the Petition.

## **2. Petition Description**

The Petition for Rulemaking asserts that the EQB should promulgate a rule “to regulate fossil fuel carbon dioxide emissions, and to establish an effective emissions reduction strategy that will achieve safe atmospheric concentrations of carbon dioxide by 2100.” The Petition further asserts that Article I, Section 27 of the Pennsylvania Constitution imposes a duty on the Commonwealth of Pennsylvania to protect the state’s atmosphere.

In support of this Petition, Ms. Funk cites a number of scientific studies to support her conclusions that the science unequivocally shows that anthropogenic climate change is occurring, and it’s threatening the stability of the global climate, and climate change is already occurring in Pennsylvania, and is projected to significantly impact the state in the future.

To remedy the threat identified in the Petition, Ms. Funk suggests that a rule should be designed to achieve the general goal of reducing CO<sub>2</sub> emissions through the following means:

1. Regulatory Goal. Starting in 2013, annual fossil fuel CO<sub>2</sub> emissions in Pennsylvania will be reduced by at least 6 percent per year as determined by the previous year’s annual CO<sub>2</sub> emission rate through 2050.

2. Baseline Emission Rate. The Department shall determine the amount of CO<sub>2</sub> emitted in 2012 from all fossil fuel-burning sources in the Commonwealth, which will be the Baseline CO<sub>2</sub> Emission Rate for purposes of this regulation.

3. Determination of Annual CO<sub>2</sub> Emission Rate. The Department shall undertake such actions as are necessary to determine the amount of CO<sub>2</sub> emitted each year from all fossil fuel-burning sources in Pennsylvania.

4. Reductions in Annual CO2 Emission Rate. The Department shall undertake such actions as are necessary to achieve at least a 6 percent reduction in the annual CO2 emission rate from the baseline CO2 emission rate by the end of 2013, and then at least a 6 percent reduction in the annual CO2 emission rate each year compared to the annual CO2 emission rate of the previous year, through the year 2050.

### C. SUMMARY OF THE DEPARTMENT'S REPORT ON THE PETITION

On April 15, 2014, the Department sent its *Evaluation Report on the Ashley Funk Petition for Rulemaking to Reduce Carbon Dioxide Emissions* (“April 15 Report”) to the Petitioner. (See Exhibit 2). That April 15 Report identified a number of actions that Pennsylvania is taking to reduce greenhouse gas (“GHG”) emissions from sources in Pennsylvania. For instance, under the Pennsylvania Climate Change Act, 71 P.S. §§ 1361.1 – 1361.8, the Department, in consultation with the Climate Change Advisory Committee, which includes of state agencies, private industry, and environmental groups, reviewed all of the issues associated with climate change, including, but not limited to, the science, technology, and economic and social impacts. Based on this review the Department has published two reports on climate change in 2009 and 2013, respectively – the Climate Change Action Plan,<sup>1</sup> (“2009 Plan”) and Climate Change Action Plan Update<sup>2</sup> (“2013 Update”). Much of the work associated with the April 15 Report on the Petition for Rulemaking relies on the findings and recommendations in the 2009 Plan and 2013 Update.

The April 15 Report identified a number of substantive actions that the Department and other trustees are taking to reduce GHG emissions from sources in Pennsylvania. Overall, Pennsylvania’s gross GHG emissions are expected to be lower in 2020 than in 2000, with reductions in the residential, commercial, transportation, agriculture and waste sectors. The total

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<sup>1</sup> The Climate Change Action Plan, December 18, 2009, is available at [http://www.portal.state.pa.us/portal/server.pt/community/climate\\_change\\_advisory\\_committee/10412](http://www.portal.state.pa.us/portal/server.pt/community/climate_change_advisory_committee/10412).

<sup>2</sup> The “Climate Change Action Plan Update”, December 2013, is available at [http://www.portal.state.pa.us/portal/server.pt/community/climate\\_change\\_advisory\\_committee/10412](http://www.portal.state.pa.us/portal/server.pt/community/climate_change_advisory_committee/10412)

statewide emissions sinks are also expected to increase, creating additional net GHG benefits through 2020.

The Department also reviewed the suggested regulatory language in the Petition for Rulemaking that calls for a 6 percent CO<sub>2</sub> reduction from all fossil fuel-fired sources in Pennsylvania and concluded that the approach would not achieve the purpose of the Petition for Rulemaking, which is to achieve a safe atmospheric concentration of CO<sub>2</sub> or 350 ppm by 2100. As a result, it was recommended that the Petition for Rulemaking be denied.

**D. PETITIONER'S REPLY TO THE DEPARTMENT'S APRIL 15, 2014,  
EVALUATION REPORT**

The Petitioner's Reply provides a summary of the constitutional mandate she believes that the Commonwealth (and the EQB and the Department as arms of the Commonwealth) have to meet in this matter. (*See Exhibit 3*). Petitioner asserts that in the context of the requested Petition for Rulemaking, the constitutional imperative of Article I, Section 27 requires consideration and development of policies that protect present and future generations of Pennsylvanians from the disruptions of climate change. Petitioner asserts that the Pennsylvania Constitution requires the Commonwealth to conserve and maintain the atmosphere in order to protect Ms. Funk and future Pennsylvanians. Petitioner concludes that the Department's April 15 Report's recommendation is to do nothing, which is fundamentally inconsistent with that constitutional obligation. Petitioner therefore requests that the EQB order the Department to begin the requested rulemaking process.

The Petitioner's Reply also identifies specific faults she finds in the Department's April 15 Report. Petitioner asserts that the Department's analysis is based on science that is outdated or incomplete, rather than the best and latest science. The Reply also responds to the Department's claims about its efforts to address climate change and asserts that the lifecycle of GHG emissions from fracking are greater than or equal to the lifecycle of GHG emissions from coal.

Finally, the Petitioner's Reply responds to the concerns raised in the April 15 Report that the Petition for Rulemaking does not credit Pennsylvania's actions that reduce GHGs, and the concern that the proposed regulatory approach to reduce GHG emissions would be ineffective in achieving the stated regulatory goal. The Petitioner respectfully suggests that, in light of her

analysis, the EQB should reject the Department's recommendation in its April 15 Report and direct the Department to proceed with the rulemaking sought in the Petition.

What follows is the Department's Response to the Petitioner's Reply.

## **E. DEPARTMENT'S RESPONSE TO THE PETITIONER'S REPLY**

### **PETITIONER COMMENT**

**Article 1, Section 27 requires the Commonwealth as public trustee to protect the atmosphere for present and future generations by regulating CO2 emissions so as to achieve safe atmospheric concentrations.<sup>3</sup>**

### **DEPARTMENT RESPONSE**

The Department acknowledges that it has an important role as trustee in protecting and preserving the rights and values contained in Article I, Section 27 of the Pennsylvania Constitution. However, protection of the atmosphere requires the efforts of multiple trustees, not to mention participation by the public - in this Commonwealth, nationally, and globally. Nonetheless, the Department plays a substantial role, within the scope of its legal authority with a balanced approach to sustainable development, in reducing CO2 emissions. The Department in its April 15 Report on the Petition for Rulemaking identified a number of concrete actions that the Department and other public trustees such as the General Assembly, the Department of Agriculture, and the Public Utility Commission (“PUC”) are taking to reduce CO2 emissions in Pennsylvania.

Those concrete actions, which are identified in both the 2009 Plan and 2013 Update, include, but are not limited to, the following:

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<sup>3</sup> Petitioner's Reply at 1-2.

## **2009 Plan Actions**

### **The Pennsylvania Alternative Energy Portfolio Standards**

The Alternative Energy Portfolio Standards (“AEPS”) Act of 2004, 73 P.S. §§ 1648.1-1648.8, requires electric distribution companies (“EDCs”) and electric generation suppliers (“EGSs”) to supply 18 percent of electricity using alternative energy resources by 2021.<sup>4</sup> The Department estimates that, based on the cumulative results (2009-2020), GHG reductions for this program is 76 Million Metric ton of CO<sub>2</sub> equivalence (“MMtCO<sub>2</sub>e”).<sup>5</sup>

### **Act 129 of 2008, Phases I, II, and III**

Act 129 of 2008 was signed into law on October 15, 2008 and requires electricity reduction measures. The Pennsylvania PUC has primary implementation responsibility and has established an energy efficiency and conservation program implementation order. This order requires all EDCs to develop and implement cost-effective energy efficiency and conservation plans to reduce consumption and peak load within their service territories. The Department estimates that, based on the cumulative results (2009-2020), GHG reductions will be 40 MMtCO<sub>2</sub>e.<sup>6</sup>

### **Residential/Commercial Energy Efficiency Standards**

In *New York v. Bodman*, 05 Civ. 7807 (S.D.N.Y.), the Department and a number of other states secured a federally enforceable settlement agreement with the United States Department of Energy (“DOE”) to establish energy efficiency standards for a range of consumer and

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<sup>4</sup> 2009 Plan at 4-9 and April 15 Report at 18.

<sup>5</sup> CO<sub>2</sub>e is a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential or GWP. Greenhouse gases include, carbon dioxide, methane, nitrous oxide, ozone, chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride. See <http://www.epa.gov/climatechange/glossary.html#GreenhouseGas>

<sup>6</sup> 2009 Plan at 4-9 and April 15 Report at 19.

commercial products that use large amounts of energy including electricity, natural gas, and home heating oil as required under the Energy Policy Conservation Act, 42 U.S.C. §§ 6291 *et seq.*<sup>7</sup> The Department estimates that such standards are projected to reduce GHG emissions in Pennsylvania cumulatively (2009-2020) by 28.7 MMtCO<sub>2</sub>e by 2020.<sup>8</sup>

### **Pennsylvania Clean Vehicles Program**

Under 25 Pa. Code Chapter 126, Subchapter D, the Pennsylvania Clean Vehicles Program was established to achieve emission reductions from new motor vehicles. Starting with model year 2008, any subject motor vehicle must be certified by the California Air Resources Board (“CARB”). Any changes to California’s low-emission vehicle program are automatically incorporated by reference into the Pennsylvania program. The Department estimates that cumulative (2009-2020) GHG reductions from this program alone will result in 1.27 MMtCO<sub>2</sub>e by 2020.<sup>9</sup>

On May 7, 2010, the United States Environmental Protection Agency (“U.S. EPA”) and the National Highway Transportation Safety Administration issued a joint Final Rulemaking establishing GHG emission standards and Corporate Average Fuel Economy or CAFE standards for model years 2012-2016 passenger vehicles. 75 Fed. Reg. 25,324. The combined GHG and fuel economy standards are referred to as the National Program. The Department estimates Pennsylvania’s cumulative emission reductions from 2009 through 2020 to be 57.3 MMtCO<sub>2</sub>e.<sup>10</sup>

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<sup>7</sup> See also “Energy Conservation Standards Activities Report to Congress,” August 2012, available at [http://www1.eere.energy.gov/buildings/appliance\\_standards/schedule\\_setting.html](http://www1.eere.energy.gov/buildings/appliance_standards/schedule_setting.html)

<sup>8</sup> 2009 Plan at 5-5 and April 15 Report at 20.

<sup>9</sup> *Id.*

<sup>10</sup> 2009 Plan at 5-5 and April 15 Report at 21.

## **Biofuel Development**

The Biofuel Development and In-State Production Incentive Act, 73 P. S. §§ 1650.1—1650.7, which is enforced by the Pennsylvania Department of Agriculture, requires minimum volumes of cellulosic ethanol and biodiesel to be blended into gasoline and diesel fuel, commensurate with specified in-state production levels of these biofuels. The Department estimates that cumulative (2009-2020) CO<sub>2</sub>e emission reductions will amount to 14.8 MMtCO<sub>2</sub>e.<sup>11</sup>

## **Diesel Anti-Idling**

The Diesel-Powered Motor Vehicle Idling Act, 35 P.S. § 4601 *et seq.*, restricts diesel idling to 5 minutes in any continuous 60-minute time period for diesel-powered vehicles with a gross weight of 10,001 pounds or more engaged in commerce. This act is primarily an air pollution control measure, and reductions in fuel use and CO<sub>2</sub> emissions are incidental. However, the Department estimates CO<sub>2</sub>e emission reductions of 0.7 MMtCO<sub>2</sub>e.<sup>12</sup>

## **Emission Reduction Trends**

The following figure estimates the GHG emission reductions from the 2009 Plan strategies discussed above that are currently being implemented in Pennsylvania.

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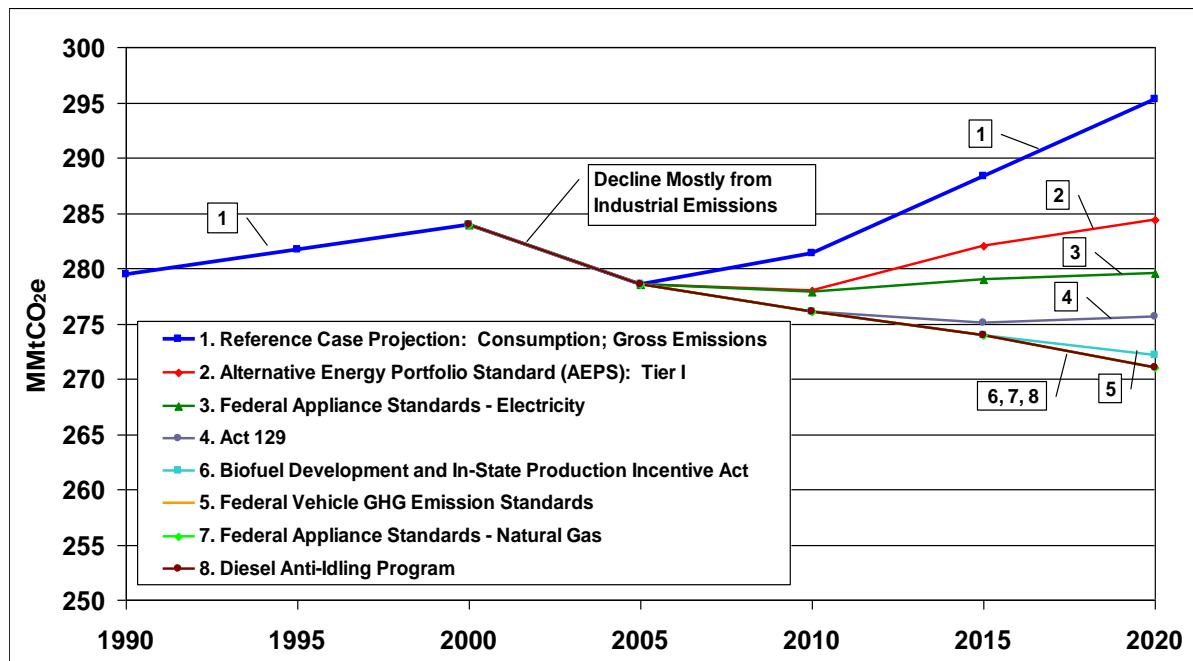
<sup>11</sup>

*Id.*

<sup>12</sup>

2009 Plan at 5-5 and April 15 Report at 22.

**Figure 1. Estimated Emission Reductions Associated with the Effect of State and Federal Actions in Pennsylvania (Consumption-Basis, Gross Emissions)<sup>13</sup>**



## 2013 Update Actions

### Electricity Production

#### Pennsylvania Actions

The Department incorporates by reference U.S. EPA's New Source Performance Standards ("NSPS") and emission guidelines into its regulatory program under 25 Pa. Code Chapter 122 (relating to National Standards of Performance for New Stationary Sources). See 9 Pa. Bull. 1447 (April 28, 1979). As U.S. EPA develops GHG performance standards for new stationary sources, these standards are automatically incorporated into Pennsylvania law. On January 8, 2014, U.S. EPA announced proposed new source performance standards for emissions of CO<sub>2</sub>, a GHG, for fossil fuel-fired electric utility generating units. 79 Fed. Reg. 1430. The

<sup>13</sup> 2009 Plan at 1-10 and April 15 Report at 23.

rule will apply only to new fossil fuel-fired electric utility generating units (“EGUs”). For purposes of this rule, fossil fuel-fired EGUs include utility boilers, integrated gasification combined cycle (“IGCC”) units and certain natural gas-fired stationary combustion turbine EGUs that generate electricity for sale and are larger than 25 megawatts (“MW”).

To date the Department has issued two plan approvals for the construction of combined cycle natural gas turbine projects with best available technology (“BAT”) emission rates under the Pennsylvania Air Pollution Control Act, 35 P.S. § 4001 *et seq.*, (“APCA”) that are consistent with the proposed NSPS for natural gas-fired EGUs.<sup>14</sup> While the Department cannot estimate any overall CO<sub>2</sub>e reductions that will result from the implementation of the NSPS, U.S. EPA estimates that, based on the emission rate requirements under their proposal, CO<sub>2</sub> emissions will be reduced by an average of 40 percent when compared to the expected emissions of a new super-critical pulverized coal boiler.<sup>15</sup>

In June 3, 2010, U.S. EPA promulgated its *Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*, which regulates GHG emissions from new and modified air contamination sources. 75 Fed. Reg. 31514. However on June 23, 2014, the U.S. Supreme Court held that U.S. EPA cannot require a stationary source to obtain a Prevention of Significant Deterioration (“PSD”) or Title V permit on the sole basis of its potential to emit greenhouse gas emissions, which overturned the Tailoring Rule. *Utility Air Regulatory Group v. U.S. EPA*, (U.S., No. 12-1146). At the same time, however, the Court also held that U.S. EPA may require a stationary source to implement best available control technology (“BACT”) for GHGs if it already triggers PSD permitting anyway, based on its potential to emit conventional or criteria

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<sup>14</sup> April 15 Report at 29.

<sup>15</sup> 79 Fed. Reg. at 1471.

pollutants.<sup>16</sup> Pennsylvania implements these BACT GHG requirements through its PSD program under 25 Pa. Code Chapter 127, Subchapter D and Title V Operating Permits program under 25 Pa. Code Chapter 127, Subchapter G. To date, the Department has issued four plan approvals for natural gas-fired EGUs that have GHG BACT emission rates, which will reduce the growth of GHG emissions in Pennsylvania.

On June 2, 2014, U.S. EPA announced the issuance of proposed carbon pollution emission guidelines for existing power plants under Section 111(d) of the federal Clean Air Act, 42 U.S.C. § 7411(d), with final guidelines no later than June 1, 2015. 78 Fed. Reg. 39535 (July 1, 2014). These proposed guidelines were subsequently published on June 18, 2014. 79 Fed. Reg. 34830. Moreover, also on June 18, 2014, U.S. EPA also proposed, in a separate rulemaking, carbon pollution standards for modified and reconstructed EGUs. 79 Fed. Reg. 34960.

Any final guidelines or standards will be incorporated into the Department's air quality regulatory program under 25 Pa. Code Chapter 122 (relating to National Standards of Performance for New Stationary Sources). As proposed, Pennsylvania would have one year from the finalization of those emission guidelines to submit a state plan that is consistent with U.S. EPA's final rule. According to this U.S. EPA proposal, for existing EGUs, it is anticipated

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<sup>16</sup> See also EPA Memorandum entitled “Next Steps and Preliminary Views on the Application of Clean Air Act Permitting Programs to Greenhouse Gases Following the Supreme Court’s Decision in *Utility Air Regulatory Group v. Environmental Protection Agency*, From: Janet McCabe and Cynthia Giles, To: Regional Administrators, Regions 1-10, July 24, 2014 (For new “anyway” sources, EPA intends to continue applying PSD BACT requirements to GHG emissions if the source emits or has the potential to emit at least 75,000 tpy GHGs. For modified “anyway” sources, EPA intends to continue applying PSD BACT to GHGs if (i) the modification is otherwise subject to PSD for a pollutant other than GHG, and (ii) the modification results in a GHG emissions increase and net GHG emissions increase greater than or equal to 75,000 tpy CO<sub>2</sub>e and greater than zero on a mass basis).

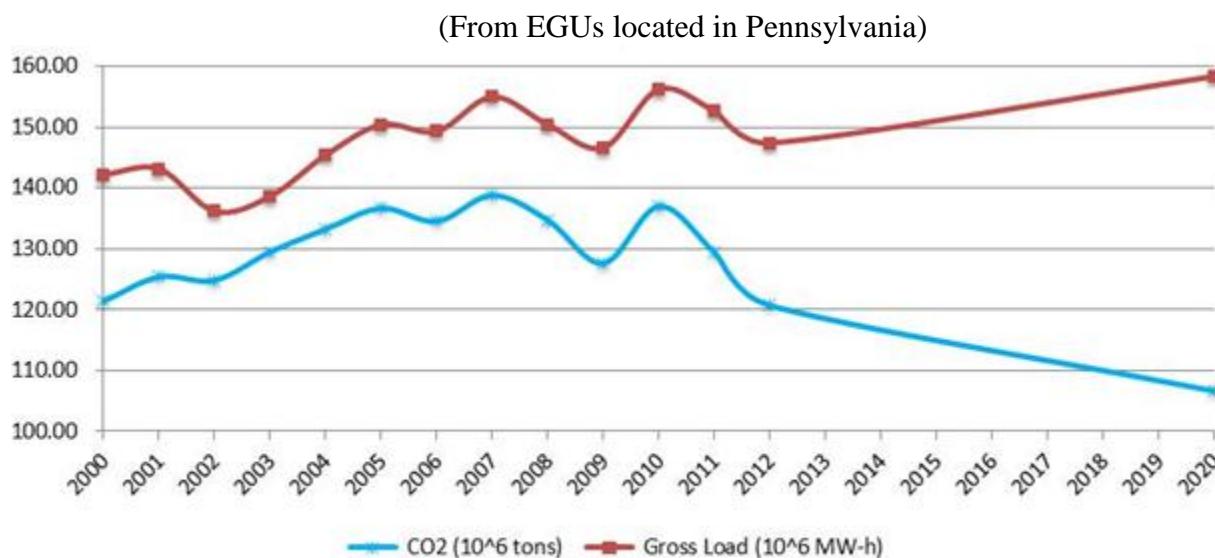
that Pennsylvania will need to make a 42 percent reduction in CO<sub>2</sub> emissions from a 2005 baseline by 2030.<sup>17</sup>

### ***Emission Trends***

Recently, data from U.S. EPA confirmed that the retirement of coal plants in Pennsylvania will result in an emissions savings of about 14 MMtCO<sub>2</sub>e annually.<sup>18</sup> The new generating capacity proposed for Pennsylvania will produce about 6.45 MMtCO<sub>2</sub>e in 2020, resulting in a total of 5.5 MMtCO<sub>2</sub>e savings.<sup>19</sup>

Although CO<sub>2</sub> emissions trends from EGUs show a decline through 2020, EGUs in Pennsylvania continue to increase gross load above 2000 levels. A 7 percent increase in gross load can be seen in Figure 2, which follows.<sup>20</sup>

**Figure 2. Carbon Dioxide Emissions Trends 2000-2020**



<sup>17</sup> Available at <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule>

<sup>18</sup> April 15 Report at 50.

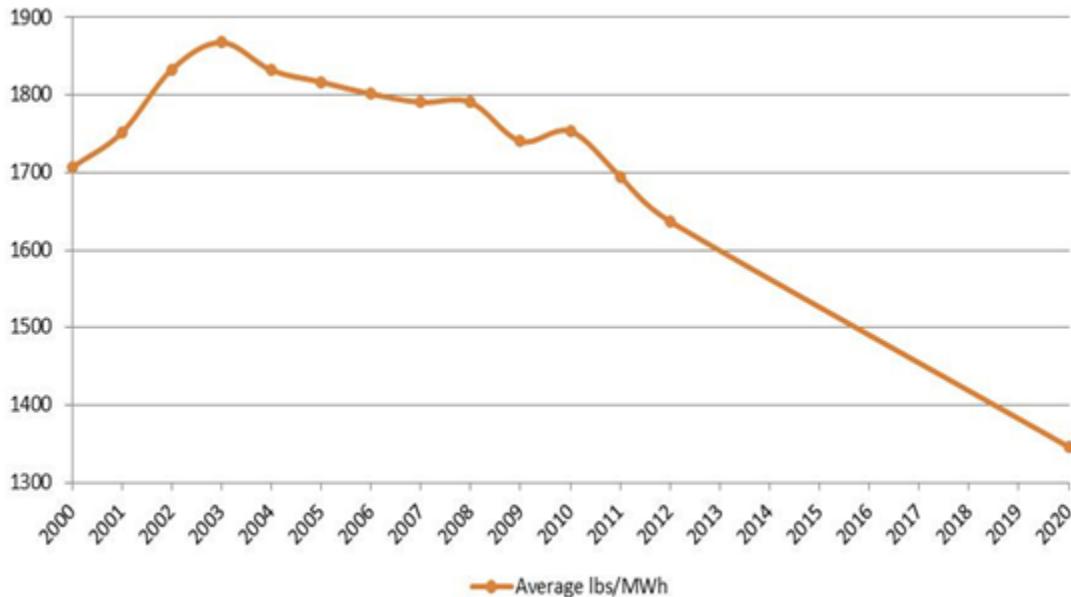
<sup>19</sup> U.S. EPA, Clean Air Market Emissions Report – Pennsylvania (2010) and April 15 Report at 9.

<sup>20</sup> 2013 Update at 30 and April 15 Report at 46.

The next figure shows a decline in the emissions rate of CO<sub>2</sub> projected from 2000 to 2020.<sup>21</sup> As can be seen in Figure 3, the emissions rate declines from about 1,700 pounds per megawatt hour (“lbs/MWh”) in 2000 to about 1,350 lbs/MWh in 2020. This is approximately a 21 percent decrease in the CO<sub>2</sub> emissions rate from Pennsylvania’s EGUs over the projected 20-year period. The emissions rate reduction is also attributed to the planned retirement of coal-fired EGUs across the state and the planned conversion of other existing coal-fired EGUs to cleaner burning natural gas.

**Figure 3. Output Based on Emission rate of CO<sub>2</sub> lbs/MWh 2000-2020**

(From EGUs located in Pennsylvania)



<sup>21</sup>

*Id.*

## **Natural Gas Compression and Processing Facilities - General Permit 5 (GP-5)<sup>22</sup>**

On February 2, 2013, the Department finalized revisions to a general plan approval and general operating permit for natural gas-fired engines and equipment at gas processing plants and compressor stations that help move gas from well sites into transmission pipelines.

The revised GP-5 establishes requirements for BAT and a comprehensive leak detection and repair (“LDAR”) program to minimize emissions including GHG emissions. The revised general permit also limits the GHG emissions including leaks from all sources and associated air pollution control equipment located at a natural gas compression and/or processing facility.

## **Natural Gas Well Sites (Exemption Category No. 38)<sup>23</sup>**

On August 10, 2013, the Department finalized an amendment to the Air Quality Permit Exemption List for Category No. 38 (pertaining to oil and gas exploration, development, production facilities and associated equipment and operation). The final guidance for Exemption Category No. 38 provides flexibility by allowing each owner or operator to seek an air quality Plan Approval from the Department or demonstrate compliance with the requirements for controls and work practices under Exemption 38, which are more stringent than the federal rules. The Category No. 38 exemption criteria include practices such as Reduced Emission Completion or “green completion” instead of current practice of either venting or flaring. The criteria also include an LDAR program for the entire well pad and facility, rather than just the storage vessels as required by federal rules.

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<sup>22</sup> 2013 Update at 16 and April 15 Report at 31.

<sup>23</sup> *Id.*

This LDAR program will have a significant impact on the reduction of methane emissions at these sources. According to U.S. EPA, natural gas (methane) is approximately 25 times more harmful as a GHG than CO<sub>2</sub>.<sup>24</sup>

### **Alternative Fuel Incentive Grant Program<sup>25</sup>**

There have also been great strides made since 2009 in the alternative fuel vehicle sector. The Alternative Fuel Incentive Grant (“AFIG”) program, which was first implemented in the early 1990s, remains a very effective grant program in Pennsylvania. AFIG continues to provide rebates for lower-emitting alternative fueled vehicles (“AFVs”) and also provided a \$1 million grant for the installation of electric vehicle charging infrastructure at each of the rest stops along the Pennsylvania Turnpike. AFIG and the electric vehicle infrastructure programs assist in reducing GHGs in Pennsylvania.

### **Act 13 of 2012<sup>26</sup>**

In addition to this program, Act 13 of 2012 provided \$20 million, funded by natural gas operator impact fees, over three years for the purchase or retrofit of heavy-duty vehicles to operate on natural gas. In the two of three grant rounds, 713 heavy-duty vehicles were purchased or converted to run on natural gas, which will support 30 new re-fueling stations in Pennsylvania. It is projected that these projects will displace 3.67 million gallons of gasoline each year, which will result in the reduction of 45,703 tons (.04 MMtCO<sub>2</sub>e) of CO<sub>2</sub> emissions per year.

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<sup>24</sup> See “2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantially Revised Data Elements,” 78 Fed. Reg. 71904, 71909. November 29, 2013.

<sup>25</sup> 2013 Update at 17 and April 15 Report at 35.

<sup>26</sup> 2013 Update at 16 and April 15 report at 36.

## **Industrial Boilers and Process Heaters<sup>27</sup>**

The Department incorporates U.S. EPA's Maximum Achievable Control Technology ("MACT") requirements into its regulatory program under 25 Pa. Code Chapter § 127.35 (relating to Maximum Achievable Control Technology Standards for Hazardous Air Pollutants). See 24 Pa. Bull. 5899 (November 26, 1994). On December 20, 2012, EPA finalized MACT emissions standards for industrial boilers and process heaters. 78 Fed. Reg. 7138. In general, this final rule requires facilities classified as major sources of hazardous air pollutants with affected boilers or process heaters to reduce emissions of harmful toxic air emissions from these combustion sources. Existing affected boilers are required to comply with the MACT requirements by January 31, 2016, unless a one-year extension is granted under the CAA.

In order to comply with these MACT standards, several existing industrial and institutional coal-fired boilers are in the process of being converted to burn natural gas, which will result in additional GHG emission reductions.

## **Landfill Gas NSPS Proposal and Advanced Notice for Existing Sources**

While not mentioned in the Department's April 15 Report, it should be noted that U.S. EPA published in the *Federal Register* a proposed rule to revise the NSPS for municipal solid waste (MSW) landfills<sup>28</sup> and an Advanced Notice of Proposed Rulemaking<sup>29</sup> seeking public feedback on options for updating emission standards for existing MSW landfills under Clean Air Act Section 111(d). The new proposal is part of that agency's "Climate Action Plan – Strategy to Reduce Methane Emissions." Landfills subject to the proposed NSPS would be required, among other things, to capture two-thirds of their methane and air toxics emissions by 2023,

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<sup>27</sup> 2013 Update at 16 and April 15 Report at 30.

<sup>28</sup> 79 Fed. Reg. 41796, (July 17, 2014).

<sup>29</sup> 79 Fed. Reg. 41772, (July 17, 2014).

which is 13 percent more than they must capture under current regulations. Any final guidelines or standards will be incorporated into the Department's air quality regulatory program under 25 Pa. Code Chapter 122 (relating to National Standards of Performance for New Stationary Sources).

### **PUC Efforts to Reduce Methane Leakage<sup>30</sup>**

There are two PUC programs that will further contribute to the reduction of natural gas leaks and thus decrease fugitive methane emissions in Pennsylvania. The amount of emission reductions has not been calculated by the PUC; as such, a reduction is viewed as a co-benefit and not the main driver for either program. The two programs are Act 11 of 2012 (or Distribution System Improvement Charge (“DSIC”)) and the PUC’s April 4, 2013, final rulemaking at L-2012-2294746, regarding unaccounted-for-gas (“UFG”).

### **Legislative Recommendations<sup>31</sup>**

The 2013 Update also identifies nine different actions that the Department recommends to the Pennsylvania Legislature to further reduce GHG emissions. These recommendations include addressing the long-term liability of carbon capture and sequestration; providing incentives for coal mine methane usage; evaluating Act 11 of 2012; expanding access to natural gas utilities; providing incentives for AFVs; considering legislation for energy use profiling of commercial buildings; expanding competitive electricity markets to foster and encourage alternative and renewable energy suppliers to enter Pennsylvania’s market; supporting the implementation of the AEPS; and amending AEPS to include additional waste-to-energy facilities.

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<sup>30</sup> 2013 Update at 12 and April 15 Report at 33.

<sup>31</sup> 2013 Update at 2 and April 15 Report at 10.

Moreover, it should be noted that on June 3, 2014, the Pennsylvania Senate passed amendments to the Pennsylvania Construction Code Act (“Building Codes SB 1023”) with a vote of 47-1 and referred the legislation to the Labor & Industry Committee in the House of Representatives. The enactment of the amendments will help Pennsylvania keep up with current energy efficient Building Codes.<sup>32</sup>

**PETITIONER COMMENT**

**The Commonwealth has a duty to act toward the corpus of the trust—the public natural resources—with prudence, loyalty, and impartiality.<sup>33</sup>**

**DEPARTMENT RESPONSE**

This is essentially the same comment as the prior one. As this duty relates to the protection of the ambient air and other public resources, the Department, as a trustee, meets its constitutional obligations in a number of ways. First, the EQB, as is detailed in the Department’s April 15 Report, has promulgated regulations, developed by the Department, that reduce GHG emissions, and the Department implements those regulations in Pennsylvania under the APCA

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<sup>32</sup> Links to the latest versions of Building Codes SB 1023 and HB 1209 are below:  
<http://www.legis.state.pa.us/cfdocs/billInfo/billInfo.cfm?sYear=2013&sInd=0&body=S&type=B&bn=1023>  
<http://www.legis.state.pa.us/cfdocs/billInfo/billInfo.cfm?sYear=2013&sInd=0&body=H&type=B&bn=1209>

Links to the latest versions of High Performance Buildings HB 34 and SB 1061 are below:  
<http://www.legis.state.pa.us/cfdocs/billInfo/billInfo.cfm?sYear=2013&sInd=0&body=h&type=b&bn=34>  
<http://www.legis.state.pa.us/cfdocs/billinfo/billinfo.cfm?syear=2013&sind=0&body=S&type=B&BN=1061>

<sup>33</sup> Petitioner’s Reply at 4-6.

and the federal Clean Air Act. Additionally, the Department has complied with the applicable provisions of the Climate Change Act of 2008, as well.

Next, the record is well documented with efforts that demonstrate the Department is making reasonable efforts and progress in reducing GHG emissions in Pennsylvania. The record consists of the 2009 Plan, the 2013 Update, the April 15 Report, and the regulatory rulemaking packages. Moreover, the record clearly shows that the programs the Department and other Commonwealth trustees implemented have markedly reduced GHG emissions in Pennsylvania.

Lastly, the record discloses that the GHG mitigation techniques Pennsylvania developed and implemented were arrived at through a deliberative process, either through the traditional rulemaking process or Climate Change Act process, that included the public, environmental groups, and other Commonwealth trustees, who examined all technical aspects related to cost, technology availability, and climate science, and designed a Pennsylvania-specific program to reduce GHG emissions. This balanced, reasonable approach is consistent with the Department's role as trustee. The Department fundamentally disagrees with the Petitioner's one-size-fits-all approach that cannot possibly achieve its stated goal – a CO<sub>2</sub> concentration of 350 ppm – through a national patchwork of uncoordinated state and municipal regulatory programs.

Moreover, as alluded to previously, the Department together with other Commonwealth trustees, including the Department of Conservation and Natural Resources, the PUC, and the General Assembly, in consultation with environmental groups and industry representatives, have examined, and continue to examine, issues related to climate change and measures to reduce GHG emissions as part of the work of the Climate Change Advisory Committee.

The Department, as part of its fiduciary duty as a Commonwealth trustee, only approves air quality plan approvals and operating permits for new natural gas-fired EGUs with BAT

emission rates under the APCPA that are consistent with the proposed NSPS for those standards.<sup>34</sup>

All natural gas compressor stations are permitted under GP-5, which establishes requirements for BAT and a comprehensive LDAR program to minimize emissions including GHG emissions. The revised general permit also limits the GHG emissions including leaks from all sources and associated air pollution control equipment located at a natural gas compression and/or processing facility. These and other actions taken by the Department show that it restrains the actions of private parties in limiting the amount of GHGs that may be emitted into the atmosphere.

Concomitantly, these Department actions, which reduce GHG emissions from permitted sources, are premised on a statutory and regulatory structure that was developed to protect the air resources to the degree necessary for, among other things, the protection of public health, safety, and well-being of Pennsylvania's citizens. *See generally*, 35 P.S. § 4002. *See also* 25 Pa. Code § 127.1. Both the APCPA and its implementing regulations define the regulatory powers and duties of the Department, describe the prohibited conduct of private individuals and entities, provide procedural safeguards, and enunciate the technical standards of environmental protection. It is through this approach that Pennsylvania has, to date, taken action that will assist in reducing GHG emissions by 5.36 MMtCO<sub>2</sub>e in 2010, 14.55 MMtCO<sub>2</sub>e by 2015, and 24.64 MMtCO<sub>2</sub>e by 2020.<sup>35</sup>

To be sure, the Petitioner characterized these reductions as "modest," "self-congratulatory," and falling short of the Department's "constitutional obligation." However, what the Petitioner does not, and indeed cannot, dispute, is that the Department and other Commonwealth trustees are taking affirmative statutory and regulatory steps to reduce GHG emissions in Pennsylvania. The steps taken to reduce GHG emissions are done in a deliberative

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<sup>34</sup> April 15 Report at 29.

<sup>35</sup> 2009 Plan at 6-6 and April 15 Report at 24.

manner through a consensus process through the Climate Change Advisory Committee, which is made up of representatives from state agencies, environmental groups, and industry. It is a balanced approach that reduces emissions to enhance environmental protection through cost-effective measures, while allowing for sustainable economic growth. As noted in the Department's April 15 Report, the actions of the Committee are ongoing. Moreover, the Department's actions to reduce GHG emissions are not static, and are ongoing.

Implicit in the Petitioner's response is that the Department should not be permitting or authorizing GHG emissions from any source in Pennsylvania. However, there is nothing under Article 1, Section 27 to suggest such a result. The Commonwealth's duty to conserve and maintain its natural resources is balanced by appropriate economic development that is sustainable in nature.

As previously alluded to, this balancing is most evident in how the Department permits new EGUs with BAT emission rates, which are consistent with the proposed NSPS for those standards and best available technology or BAT under the APCA. Furthermore, all natural gas compressor stations are permitted under GP-5, which establishes requirements for BAT and a comprehensive LDAR program to minimize emissions including GHG emissions. As a result, the citizens benefit from a reliable energy source that is also cleaner burning and reduces GHG emissions.

Similarly, Pennsylvania adopted by reference the CARB emission standards for new light-duty passenger vehicles and trucks. As new CARB standards for the subject vehicles are adopted by California, Pennsylvania receives the emissions reduction benefits from those standards. The latest version of the CARB program, the California Low Emissions Vehicles III ("Cal LEV III"), applies to 2015 model year and later vehicles. The Federal Tier III vehicle

program that was recently finalized by EPA has been harmonized with CARB standards except that the federal standards affects 2017 model year and later vehicles. Therefore, Pennsylvania will benefit from fewer GHG emissions from vehicles two years earlier than those states that did not adopt CARB standards.

**PETITIONER COMMENT**

**The scientific data and analysis underlying DEP's report is not the best science, is outdated, or is incomplete. The April 15 Report fails to adequately address the ample scientific evidence included in the Petition for Rulemaking, which includes scientific studies from the world's leading climate scientists.<sup>36</sup>**

**DEPARTMENT RESPONSE**

The scientific data cited in the Department's April 15 Report came from the 2009 Plan and is cited for the proposition that the Department, in general, agrees with the Petitioner's contention that GHG emissions from anthropogenic sources are causing changes in the Earth's climate. The Department acknowledges that impacts are being felt in Pennsylvania and globally. Moreover, the science that the Department has reviewed is broadly consistent with all of the studies cited by the Petitioner. However, the intent of the Department's report was not to review each study cited in the Petition for Rulemaking to determine if the Department agrees with the assertions laid out in each study. Rather, the intent of the Department's April 15 Report was to evaluate the need and efficacy of the regulatory proposal as identified in the Petition for Rulemaking. The Department, as a scientific regulatory agency, understands that science is an

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<sup>36</sup> Petitioner's Reply at 7-8.

iterative process. As the April 15 Report itself concludes, the need to reduce GHG emissions is clear.<sup>37</sup>

**PETITIONER COMMENT**

**The science cited in the Petition, and not seriously challenged by DEP, leads to the conclusion that safe atmospheric concentrations of CO<sub>2</sub> by the end of this century require 6 percent per year reductions through at least 2050 starting immediately—exactly what the Petition asks DEP to do.<sup>38</sup> As the Petition notes, “the best available science . . . shows that to protect Earth’s natural systems, average global surface heating must not exceed 1° C this century.<sup>39</sup> To prevent global heating greater than 1° C, concentrations of atmospheric CO<sub>2</sub> must decline to less than 350 ppm this century.” Petitioner has provided sound scientific evidence showing that allowing a 2° C rise in temperatures would be catastrophic.<sup>40</sup>**

**DEPARTMENT RESPONSE**

When the Department reviewed the science contained in the Petition, it broadly agreed that anthropogenic emissions are the primary cause of concern and those emissions must be reduced. However, the Department does not necessarily agree that CO<sub>2</sub> levels must be reduced to 350 ppm, because scientific consensus has not been reached on that issue. The Department understands that the Petitioner relies quite heavily on the findings of Hansen *et al.*, to make her point, but the Intergovernmental Panel on Climate Change (“IPCC”) does not necessarily agree that 350 ppm is the level that must be reached.

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<sup>37</sup> 2009 Plan at ExS-2 and April 15 Report at 11.

<sup>38</sup> Petitioner’s Reply at 8.

<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

In its 5<sup>th</sup> Assessment Report, the IPCC notes that the most prominent target currently discussed is the 2°C temperature target, that is, to limit global temperature increase relative to pre-industrial times to below 2°C.<sup>41</sup> The IPCC notes that the 2°C target was first proposed by the European Union as a policy target in 1996, but can be traced further back. (Jaeger and Jaeger, 2010; Randalls, 2010). The assessment report finds that climate impacts are geographically diverse (Joshi et al., 2011) and sector specific, and no objective threshold defines when dangerous interference is reached. Some changes may be delayed or irreversible, and some impacts are likely to be beneficial.<sup>42</sup> The IPCC further remarks that it is not possible to define a single critical threshold without value judgments and without assumptions on how to aggregate current and future costs and benefits.<sup>43</sup>

The assessment report goes on to say that targets other than 2°C have been proposed (e.g., 1.5°C global warming relative to pre-industrial), or targets based on CO<sub>2</sub> concentration levels, for example, 350 ppm (Hansen et al., 2008).<sup>44</sup> The IPCC further notes that the rate of change may also be important (e.g., for adaptation).<sup>45</sup> The IPCC 5<sup>th</sup> Assessment Report does not advocate or defend any threshold.<sup>46</sup> As a result, the best available science does not agree that 350 ppm is the most optimal level necessary to stabilize the climate. As the IPCC itself notes, it is not possible to define a single critical threshold without value judgments and without assumptions on how to aggregate current and future costs and benefits.<sup>47</sup>

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<sup>41</sup> Climate Change 2013, The Physical Science Basis, Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 1107.

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

**PETITIONER COMMENT**

**One of the most troubling and misleading aspects of the DEP's April 15 Report concerns the numerous references to various plans and programs to reduce GHG emissions, especially the recommendations in the 2009 Plan that are not actually happening.<sup>48</sup> These references are misleading because the GHG emission reductions in the 2009 Plan are just recommendations and many of the recommendations have not been implemented, as the DEP admits.**

**DEPARTMENT RESPONSE**

The Department in its April 15 Report made it very clear in several places that not all of the strategies identified in the 2009 Plan have been implemented. The Department stated that the 2009 Plan remains a valuable resource in the Department's ongoing process to develop and implement cost-effective strategies to reduce GHG emissions in Pennsylvania.

The Department wanted to provide the Petitioner with the full breadth of activities that the Department was undertaking to reduce GHG emissions in Pennsylvania. The 2009 Report in its entirety is part of that record. The 52 work plan recommendations were only a part of the 2009 Plan. Other sections included a review of the climate science, GHG inventories, cost-effectiveness analyses, carbon sinks, and technology assessments, to name a few. In all, the 2009 Report resulted in a 615-page analysis that was completed with the help of the Climate Change Advisory Committee, all of whom are volunteers. To suggest that the Department was misleading in discussing the 52 recommendations where the Department itself noted that not all of the plans were being implemented is wholly inaccurate. Moreover, the Petitioner fails to note

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<sup>48</sup> Petitioner's Reply at 13.

that the 2009 Plan identified a number of actions that are being implemented currently in Pennsylvania that will collectively reduce GHG emissions by 24.64 MMtCO<sub>2</sub>e by 2020.

The Petitioner's response also inordinately focuses on the efforts identified in the 2009 Plan without acknowledging the emission reduction effort and inventories in the 2013 Update.

**PETITIONER COMMENT**

**DEP appears to understand the threat to constitutionally protected resources and the rights of its citizenry, present and future, but what is missing is analysis and action to demonstrate that DEP will comply with the constitutional mandate and take the necessary steps to address climate change.<sup>49</sup>**

**DEPARTMENT RESPONSE**

The Department disagrees that it is missing "analysis and action" to comply with any constitutional mandates and take steps to address climate change. As the Department noted in its April 15 Report, it has taken concrete steps to implement programs that are actually reducing GHG emissions in the Commonwealth, which are well informed by a collaborative process with a variety of stakeholders, and its own scientific staff.

Also what the Petitioner fails to acknowledge is that the GHG mitigation strategies implemented by the Department are reducing emissions. The 2013 Update summarizes the activities and actions that have taken place to reduce emissions since the publication of the 2009 Plan. Since the original Plan was prepared in 2009, there have been broad-based changes to Pennsylvania's economy and energy portfolio. Many of the changes have resulted in fewer emissions of GHGs in Pennsylvania.

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<sup>49</sup> Petitioner's Reply at 16.

The 2013 Update summarizes Pennsylvania GHG emissions and sinks for the base year 2000, 2010, and target year 2020.<sup>50</sup> For gross emissions by sector, Pennsylvania's percentage of emissions by sector is lower than the U.S. percentage of emissions for the transportation, waste and agriculture sectors. Pennsylvania's percentage of emissions by sector is higher than the U.S. percentage of emissions by sector for the industrial and residential/commercial sectors, but that percentage does not take into account recent regulatory actions and fuel conversions.<sup>51</sup>

Overall, Pennsylvania's gross GHG emissions are expected to be lower in 2020 than in 2000, with reductions in the residential, commercial, transportation, agriculture and waste sectors.<sup>52</sup> The total statewide emissions sinks are also expected to increase, creating additional net GHG benefits through 2020.

**PETITIONER COMMENT**

**Lifecycle GHG Emissions from Fracking Are Greater Than Or Equal To Lifecycle GHG Emissions From Coal.<sup>53</sup>**

**DEPARTMENT RESPONSE**

The Petitioner is incorrect and inaccurate in her response to the Department's April 15 Report regarding this topic. The 2013 Climate Change Action Plan Update did not state "the life-cycle climate impacts of natural gas power may be on par with coal-fire power generation." What the Department believes the Petitioner is referring to is the 2013 Climate Change Impacts Assessment Update, as prepared by Penn State University. The paraphrasing of the discussion by

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<sup>50</sup> 2013 Update at 23 and April 15 Report at 39.

<sup>51</sup> April 15 Report at 41.

<sup>52</sup> April 15 Report at 8.

<sup>53</sup> Petitioner's Reply at 17.

the Petitioner leads to an inaccurate conclusion. The full statements from the 2013 Climate Change Impacts Assessment Update are as follows:

“The combustion of natural gas releases approximately half of the carbon dioxide as the combustion of an equivalent amount of coal or petroleum. However, this may be offset by methane produced by the natural gas extraction process as methane is a more powerful greenhouse-gas than carbon dioxide. The direct atmospheric venting of methane (as opposed to flaring) at the wellhead, or significant leakage of methane from natural gas infrastructure, may reduce the overall greenhouse-gas reduction potential of substituting natural gas for other fossil fuels. Very little data from actual well or infrastructure operations is available that suggests the rate at which methane is vented into the atmosphere or escapes from pipelines, compressor stations or other infrastructure. Measuring the greenhouse-gas impacts of Marcellus or Utica shale development, as well as the potential greenhouse-gas reductions, involves significant uncertainties. Under scenarios where large amounts of methane are vented, or fugitive methane emissions from the gas transportation system are high (as has been found for one area of Colorado, as described in Tollefson (2012))<sup>54</sup>, the life-cycle climate impacts of natural gas power generation may be on par with coal-fired power generation (Howarth et al., 2011)<sup>55</sup>. This conclusion also rests on assumptions regarding the timing of climate impacts over which there is additional uncertainty.

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<sup>54</sup> Tollefson, J., 2012. “Air Sampling Reveals High Emissions from Gas Field,” *Nature* 482, pp. 139-140.

<sup>55</sup> Howarth, R. W., R. Santoro, and A. Ingraffea, 2011.“Methane and the greenhouse gas footprint of natural gas from shale formations,” Climatic Change Letters, DOI:10.1007/s10584-011-0061-5

Three other studies (Jiang et al.<sup>56</sup>, 2011; NETL, 2011; Cathles, 2011<sup>57</sup>) question the assumptions used by Howarth et al. (2011) and collectively draw three broad conclusions regarding the greenhouse-gas impacts of gas-shale development:

- *The reduction in life-cycle greenhouse-gas emissions from the increased utilization of shale-gas for power generation are sensitive to the efficiency of combustion and the operational scenarios. Natural gas base-load generation reduced greenhouse-gas emissions by approximately 40 to 50 percent compared to base-load coal generation. Generating electricity with natural gas in older or less-efficient plants may decrease this benefit to as little as 20 percent.*
- *Shale-gas does have a slightly higher greenhouse-gas footprint than conventional gas production, though the literature suggests less than 5 percent higher. The differences in greenhouse-gas footprint can be traced to methane venting or flaring; and differences in transportation requirements. The greenhouse-gas footprint of Marcellus Shale production and utilization is similar to that of liquefied natural gas (Jiang et al., 2011; Jaramillo et al., 2007).*
- *Where direct capture is technologically infeasible or economically unattractive, policies to encourage flaring of natural gas rather than*

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<sup>56</sup> Jiang, M., W. M. Griffin, C. Hendrickson, P. Jaramillo, J. van Briesen and A. Venkatesh, 2011. "Life Cycle Greenhouse Gas Emissions of Marcellus Shale Gas," Environmental Research Letters doi:10.1088/1748-9326/6/3/034014.

<sup>57</sup> L.M. Cathles, L. Brown, M. Taamb, and A. Hunter, 2011. "A Commentary on 'Methane and the greenhouse gas footprint of natural gas from shale formations,'" Climate Change Letters

*venting can reduce greenhouse-gas emissions associated with gas shale development.* <sup>58</sup>

According to the U.S. EPA, when methane, the major component of natural gas, is emitted into the atmosphere, it is approximately 25 times more potent a GHG than CO<sub>2</sub>.<sup>59</sup> Methane losses from natural gas extraction and delivery accounted for 32 percent of U.S. methane emissions and 3 percent of the total U.S. GHGs in 2009.

In 2011 when the paper referenced in the statement made by the Petitioner was released, there was significantly more uncertainty regarding the amount of methane leakage from natural gas extraction, production, and delivery. Since then, multiple studies have concluded that the leakage rate of methane from natural gas extraction is significantly less than the paper believed. Additionally since that paper was released, there have been significant regulatory measures undertaken to reduce methane leakage leading U.S. EPA to adjust the estimates of methane losses from natural gas by 50 percent in 2012.<sup>60</sup>

Beginning in 2015, U.S. EPA regulations will require natural gas operators to employ Reduced Emissions Completions (“RECs”), or “green completion technology” to prevent gas from escaping into the atmosphere after the well has been hydraulically fractured, since this is typically when the most methane is released. As part of the rules, since 2012 operators have been required to either flare or capture methane emissions. Many unconventional operators in Pennsylvania are already employing this type of technology when feasible. “Green completion”

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<sup>58</sup> *Pennsylvania Climate Impacts Assessment Update* (Oct 2013).  
<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document97037/PA%20DEP%20Climate%20Impact%20Assessment%20Update.pdf>

<sup>59</sup> U.S. EPA. <http://www.epa.gov/climatechange/ghgemissions/gases/ch4.html>

<sup>60</sup> U.S. EPA. *Inventory of U.S. GHG Emissions and Sinks: 1990-2011* (April 2013)  
<http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Main-Text.pdf>

technology captures the gas and condensate that is released during the flowback period after hydraulic fracturing. By implementing green completions, emissions are expected to be reduced by up to 95 percent. The new federal regulation also includes requirements for other sources of emissions in the oil and gas industry, including storage vessels.

As the Department noted in its April 15 Report, it has enacted a comprehensive program at the production stage and transmission stage for natural gas development to reduce GHG emissions from the natural gas industry. Pennsylvania has taken measures to reduce emissions from gas and oil operations that include a revised GP-5 for compressor stations and processing operations that meet emission standards set by the Department. These facilities use LDAR to reduce and control emissions of methane. Operating permit exemptions such as Category No. 33 and Category No. 38 are also available to gas and oil operations that meet the stringent criteria set by the Department.

Pennsylvania's required practices such as LDAR for the entire well pad and facility, rather than just the storage vessels, as required by federal rule, are more stringent than the federal rules. Any leaks must be repaired within 15 days unless the operator shuts the site down or is in the process of acquiring replacement parts. Emissions of volatile organic compounds and hazardous air pollutants must also be controlled beyond levels required by the federal rules. The Department's permit exemption criteria also requires that emissions of nitrogen oxides be less than 100 pounds per hour, half a ton per day and 6.6 tons per year. The federal rules do not address or limit such emissions.

The paper referenced by the Petitioner used pre-existing emissions estimates, while a more recent study organized by the Environmental Defense Fund and conducted by the University of Texas includes new empirical data of actual methane emissions of natural gas

extraction activities.<sup>61</sup> In the 2011 Howarth *et al.* paper, incorrect assumptions were also used when calculating emission sources, such as assuming that operators did not employ green completion technology or flaring. Similarly, the Howarth *et al.* paper used incorrect assumptions with regard to routine venting and equipment leaks. Howarth *et al.* also failed to acknowledge that a large fraction of produced gas that never made it to an end user was used by operators to power equipment and was not vented into the atmosphere. Howarth *et al.* also used incorrect assumptions and calculations by accounting for distribution losses for natural gas that is used for power generation, when there is no local distribution of this gas. The DOE’s National Energy Technology Laboratory (NETL 2012) found that “average natural gas base load power generation has a life cycle GWP 55% lower than average coal base load power generation on a 100-year time horizon.” It also concluded that for electricity generation, natural gas base load has 48 percent lower GHG emissions than coal on a 20-year timeframe.

The Department agrees that it is necessary to minimize the amount of methane leakage from natural gas activities and has therefore undertaken regulatory steps, more stringent than federal requirements, to require operators to employ LDAR at well sites during their extraction and production activities. By controlling the amount of methane leakage from natural gas extraction, production and delivery, the Department believes that natural gas as a fuel source is an important component of reducing GHGs in the atmosphere and slowing the impacts of climate change.

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<sup>61</sup> Allen, David T. et al (2013) *Measurement of methane emissions at natural gas production sites in the United States*. <http://www.pnas.org/content/110/44/17768.full>

**PETITIONER COMMENT**

The April 15 Report contends that, because Pennsylvania's emissions are a small fraction of global GHG emissions, any steps that Pennsylvania takes to reduce emissions will be insignificant and will not help address climate change. This argument is flawed for many reasons. First, Pennsylvania is a major emitter of GHG emissions globally and has contributed significantly to climate change.<sup>62</sup>

**DEPARTMENT RESPONSE**

The Petitioner's characterization of the Department's position is incorrect. The April 15 Report was a review of the Petitioner's recommendation that Pennsylvania reduce GHG emissions by 6 percent a year until 2050 to achieve a safe CO<sub>2</sub> atmospheric concentration. As the Department noted, reducing Pennsylvania emissions to zero by 2050 would not achieve the Petitioner's goal of achieving a safe level of CO<sub>2</sub> in the atmosphere. Such a goal can only be achieved through a concerted national and global effort.

The Petition for Rulemaking fails to address GHG growth rates for major emitter countries in 2012 like China (5.9 percent) and India (7.7 percent).<sup>63</sup> Cumulative emissions of CO<sub>2</sub> from all sources (fossil fuels plus land use change) since 1870 will reach 2,015 billion tons of CO<sub>2</sub> this year.<sup>64</sup> Because of this failure to view the issue within a global context, the Petition for Rulemaking does not have a remedy for the central issue to the problem - that a continuation of the CO<sub>2</sub> emissions growth trends observed since 2000 from *all global emitting sources* would place the world on a path to reach 2° C above pre-industrial times in 30 years. (Emphasis added).

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<sup>62</sup> Petitioner's Reply at 18.

<sup>63</sup> Carbon Dioxide Information Analysis Center, 2013 Global Carbon Project. Available at <http://cdiac.ornl.gov/GCP/carbonbudget/2013/>

<sup>64</sup> *Id.*

The Department did not say that any steps it takes to reduce GHG emissions are insignificant and will not address climate change. If that were the case, the Department would not be implementing actions that are currently reducing GHG emissions. The approach that the Department is using to implement the GHG reduction strategies is to follow a deliberative process through a consensus approach with the statutorily mandated Climate Change Advisory Committee, which is comprised of representatives from state agencies, environmental groups, and industry. It is a balanced approach that reduces emissions to enhance environmental protection through cost-effective measures, while allowing for sustainable economic growth. As noted in the Department's April 15 Report, the actions of the Committee and the Department are ongoing.

Moreover, the Department's actions to reduce GHG emissions are not static, and are ongoing. If it becomes final in its present form, the Department will need to implement U.S. EPA's Clean Power Plan under Section 111(d) of the Clean Air Act, which U.S. EPA estimates will cut carbon emissions by 30 percent nationwide by 2030. Under U.S. EPA's proposal, the Department would be required to develop a state plan to reduce CO<sub>2</sub> emissions from coal-fired power plants in Pennsylvania by 42 percent. Pennsylvania would have to submit initial or complete plans by June 30, 2016, unless it applies for and receives an extension. While the Department is still evaluating the proposed plan, a comprehensive nationwide approach, if designed correctly, is more effective than the piecemeal state-by-state approach advocated by the Petitioner.

**PETITIONER COMMENT**

**Second, the idea that Pennsylvania's emissions do not matter on a global scale contradicts the roughly 40 pages of the April 15 Report devoted to explaining the various**

**programs the Commonwealth is undertaking to reduce emissions. If Pennsylvania's emissions are insignificant, then why is the Commonwealth (supposedly) working so hard to reduce emissions?**<sup>65</sup>

**DEPARTMENT RESPONSE**

The Petitioner's characterization of the Department's position is again incorrect. The 2009 Plan notes that climate change impacts are already underway and will be realized. The 2009 Plan also states that the need to reduce GHG emissions is clear. To that end, the Department, and other trustees have been developing and implementing GHG reduction strategies that are cost-effective, balanced, and effective.

The Department analysis related to the Petitioner's call to reduce GHG emissions by 6 percent every year until 2050 to achieve a safe concentration of CO<sub>2</sub> in the atmosphere or 350 ppm. The achievement of the regulatory goal of a safe concentration of CO<sub>2</sub> in the atmosphere or 350 ppm is not something that can be achieved by the Department's actions alone. That regulatory goal may only be achieved through coordinated national and global action.

While the Petitioner may believe that the only way to mitigate GHG emissions in Pennsylvania is through her suggested regulatory approach, the Department disagrees. As the April 15 Report notes, there are many shortcoming with the Petitioner's approach, chief among them the failure to address carbon leakage. The Petition for Rulemaking has no answer for a situation where a business leaves one jurisdiction, because of a more stringent CO<sub>2</sub> regulatory regime, only to re-establish in a bordering jurisdiction that has no CO<sub>2</sub> regulatory regime and continue to emit CO<sub>2</sub> at an unregulated rate. Without a remedy for this shortcoming the

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<sup>65</sup> Petitioner's Reply at 19.

Petitioner's approach is ineffective and cannot achieve its regulatory aim of a safe concentration of atmospheric CO<sub>2</sub>.

The Department believes that its trustee responsibilities include an obligation to follow a balanced approach to GHG emission reductions by implementing cost-effective strategies at the state level and coordinating with U.S. EPA at the federal level to reduce emissions. Two obvious examples are the Biofuel Development and In-State Production Incentive Act, and the Pennsylvania Clean Vehicles Program. Using this approach, Pennsylvania is achieving real and measurable GHG emission reductions, while assuring that carbon leakage is held to a minimum. This approach to GHG emission reductions is far more preferable than the Petitioner's suggestion because the Department is able to exercise its duty to conserve and maintain the Commonwealth's natural resources in a balanced way that provides for economic development in a sustainable fashion.

**PETITIONER COMMENT**

**Third, DEP's argument that if Pennsylvania completely ceased all CO<sub>2</sub> emissions it would only reduce the global concentration of CO<sub>2</sub> by 0.06 ppm falsely assumes that no other states or countries would be reducing their emissions at the same time.<sup>66</sup>**

**DEPARTMENT RESPONSE**

The Department understands that there are a number of other states and countries that, like Pennsylvania, are reducing GHG emissions. As the April 15 Report states, 26 other states are reducing GHG emissions. However, the Department is not aware of, and the Petitioner has not cited evidence of, any state reducing its GHG emissions by 6 percent a year through 2050.

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<sup>66</sup>

*Id.*

The Department's analysis of the Petition shows that the regulatory means of reducing GHG emissions in Pennsylvania through 2050 cannot achieve the regulatory end, which is a safe concentration of CO<sub>2</sub> in the atmosphere or 350 ppm. For instance, when the Department adopts a regulation to protect air quality there is typically an emissions metric that needs to be met, like a pounds per hour limitation, to achieve an ambient standard, like the ozone National Ambient Air Quality Standard. If that metric cannot achieve the standard, the regulation is ineffective because it cannot protect public health and the environment.

The regulatory approach urged by the Petitioner has the same problem. A 6 percent reduction in GHG emissions in Pennsylvania until the year 2050 can never achieve the regulation's goal of a safe atmospheric concentration of CO<sub>2</sub> of 350 ppm. What the Petitioner fails to acknowledge is that CO<sub>2</sub> emissions are transient and global in nature. The ability of any single state jurisdiction to achieve and maintain satisfactory air quality is hampered by the steady stream of transported interstate and global emissions. That is why the Petitioner's piecemeal approach can never achieve its aim.

**PETITIONER COMMENT**

**Fourth, the Petition does not deny the point that climate change is a global issue that requires a global response. It is important to note that this Petition is part of an international campaign to reduce carbon dioxide emissions.<sup>67</sup>**

**DEPARTMENT RESPONSE**

The Department is fully aware that the Petition for Rulemaking is part of an ongoing effort by environmental groups to use the public trust doctrine to have states reduce CO<sub>2</sub>

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<sup>67</sup>

*Id.*

emissions. However, most of these efforts have been unsuccessful. For instance, the Iowa Supreme Court declined the invitation of *Kids v. Global Warming* to extend the public trust doctrine to the atmosphere. *Filippone v. Iowa DNR*, 829 N.W.2d 589, 2013 Iowa App Ct. 2013. Most recently, the U.S. Court of Appeals for the D.C. Circuit affirmed a lower court decision against Our Children's Trust and Kids vs. Global Warming, which attempted to use a novel legal argument of the public trust doctrine in federal court to force government action on climate change. The court in *Alec L. v. Gina McCarthy*, 2014 U.S. App. LEXIS 12867; 44 ELR 20130, (No. 13-5192, June 5, 2014), found that the U.S. Supreme Court recently reaffirmed that the public trust doctrine remains a matter of state law and that the contours of that public trust do not depend upon the Constitution. These and other court rulings confirm the Department's position that a state-by-state approach to force states to develop a patchwork of regulatory programs is not a legally viable solution nor is it an effective regulatory solution. The most effective approach to reducing GHG emissions must be more broadly based on a national and international scale.

**PETITIONER COMMENT**

**Under the public trust doctrine, the environment and the climate system are framed as property interests that cannot be divided, but are rather part of a greater whole shared by others. Therefore, sovereigns, including the Commonwealth of Pennsylvania, who hold these property interests in the environment, are co-tenants with one another. Any inaction of other co-tenants does not excuse the Commonwealth from action. What Pennsylvania**

**cannot do is sit back and complain that a global problem is afflicting its public resources and say it need not do anything about it.<sup>68</sup>**

**DEPARTMENT RESPONSE**

As previously noted, the Department is taking action to reduce GHG emissions from sources in Pennsylvania. It seems that the Petitioner ignores the actions the Department and other trustees have and are taking to achieve actual GHG reductions in this Commonwealth. Moreover, on June 2, 2014, U.S. EPA proposed a plan to cut carbon pollution from existing power plants. U.S. EPA estimates that nationwide, by 2030, the Clean Power Plan will help cut carbon emissions from the power sector by 30 percent from 2005 levels, while starting to make progress toward meaningful reductions in 2020. Under the proposal states, as sovereigns and co-tenants, would also have a flexible timeline - up to 15 years after the Clean Power Plan is final - for all emission reduction measures to be fully implemented in 2030.

The Clean Power Plan would be implemented under Section 111(d) of the Clean Air Act where U.S. EPA issues “emission guidelines” and identifies the “best system of emission reduction” for CO<sub>2</sub> and fossil fuel-fired EGUs. U.S. EPA has identified the emission reductions achievable using that system. States would be given the flexibility to deploy different systems of emission reduction than the “best” system identified by EPA, so long as they achieve equivalent or better emission reductions.

If it becomes final in its present form, some of the measures states, as sovereigns and co-tenants, can choose to rely on in their plans include, but are not limited to: demand-side energy efficiency programs; renewable energy standards; efficiency improvements at plants; co-firing or switching to natural gas; construction of new natural gas combined-cycle plants; transmission

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<sup>68</sup> Petitioner’s Reply at 20.

efficiency improvements; energy storage technology; retirements; expanding renewables like wind and solar; expanding nuclear; market-based trading programs; and energy conservation programs.

The proposal would require all states to submit initial or complete plans by June 30, 2016, to implement the federal emission guidelines, with the option to use a two-step process for submitting final plans if more time is needed. Individual state plans would be eligible for a one-year extension to submit a complete plan by June 30, 2017. States developing multi-state plans would be eligible for a two-year extension to June 30, 2018, and would need to submit a progress report in the interim by June 30, 2017.

Under the proposed emission guidelines, once a state submits a complete plan, U.S. EPA will review the plan and make a determination, within 12 months, to approve or disapprove the plan through a notice-and-comment rulemaking process. Under U.S. EPA's proposal the Department will be required to develop a state plan to reduce the CO<sub>2</sub> emissions from coal-fired power plants in Pennsylvania by 42 percent by 2030.

While the Department is still evaluating the proposal, at finalization, the Department will implement a Section 111(d) plan that, together with the emission reduction strategies already in place, will achieve even greater GHG reductions. Consequently, the Department continues to take an active role in protecting the Commonwealth's natural resources.

**PETITIONER COMMENT**

**The April 15 Report argues that the Petition fails to take into account the residence time of GHG emissions and that even once emissions stop the atmospheric concentration of**

**GHGs remain elevated for centuries. Rather than undermining the Petition, however, this point only underscores the need for DEP to immediately begin reducing emissions.<sup>69</sup>**

**DEPARTMENT RESPONSE**

The Department made reference to residence time of GHGs in the atmosphere because the Petition for Rulemaking did not take that into account when it established a proposed regulatory goal of achieving a safe CO<sub>2</sub> concentration, or 350 ppm, by 2100.<sup>70</sup> As the Department noted in the April 15 Report, concentration of GHGs would not return immediately to their pre-industrial levels if emissions were halted.<sup>71</sup> Methane concentration would return to values close to pre-industrial level in about 50 years, nitrous oxide concentrations would need several centuries, while CO<sub>2</sub> would essentially never come back to its pre-industrial level on time scales relevant for our society. Complete elimination of CO<sub>2</sub> emissions is estimated to lead to a slow decrease in atmospheric CO<sub>2</sub> of about 40 ppm over the 21st century. By some estimates, even with the phase-out of coal emissions, CO<sub>2</sub> would remain above 350 ppm for more than two centuries.

**PETITIONER COMMENT**

**DEP's concern about carbon leakage is unfounded because the concern can be met with a number of policies that can maintain the competitiveness of the regulated state. For example, one such policy is that of border adjustments, where an importer is either required to pay what equates to the domestic carbon tax upon importation of their goods,**

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<sup>69</sup> Petitioner's Reply at 22.

<sup>70</sup> April 15 Report at 59.

<sup>71</sup> April 15 Report at 60.

**or where the importer must pay allowances to compensate for the emissions produced during the production of such goods.<sup>72</sup>**

**DEPARTMENT RESPONSE**

The Department has no statutory or regulatory authority to impose a tax on goods or services coming into the Commonwealth.

**PETITIONER COMMENT**

**While the DEP notes that it is concerned about carbon leakage, this could be interpreted as a concern about the fear that business will leave Pennsylvania for states without strict emission limits and thus implicates economic concerns.<sup>73</sup>**

**DEPARTMENT RESPONSE**

The primary concern about carbon leakage is that a patchwork of regulations to reduce GHG emissions, which is what the Petitioner is advocating, is an ineffective way of reducing GHG emissions. In fact a patchwork of different standards and measures to reduce GHG emissions merely results in the re-allocation of production to regions with less stringent mitigation rules, or with no rules at all, leading to no reduction in GHG emissions. The Petition for Rulemaking has no answer for a situation where a business leaves one jurisdiction because of a more stringent CO<sub>2</sub> regulatory regime, only to re-establish in a bordering jurisdiction that has no CO<sub>2</sub> regulatory regime and continues to emit CO<sub>2</sub> at an unregulated rate.

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<sup>72</sup>

*Id.*

<sup>73</sup>

Petitioner's Reply at 24.

The Department's concern is not economic in nature, but one related to the effectiveness of the proposal itself. Without a uniform regulatory CO2 reduction structure that all states must comply with, a piecemeal approach as advocated by the Petitioner simply cannot work.

The notion that economic considerations cannot be considered in the protection of natural resources is an inaccurate description of the efforts the Department is making to reduce GHG emissions. The Commonwealth's duty to conserve and maintain its natural resources is balanced by appropriate economic development that is sustainable in nature. The mandate under Article I, Section 27 is not absolute.

Additionally, the fact that the Department is actively implementing programs to reduce GHG emissions in Pennsylvania can hardly be called a suspension of constitutional requirements for economic reasons. As the Department's April 15 Report found overall, Pennsylvania's gross GHG emissions are expected to be lower in 2020 than in 2000, with reductions in the residential, commercial, transportation, agriculture and waste sectors.<sup>74</sup> The total statewide emissions sinks are also expected to increase, creating additional net GHG benefits through 2020.

#### **PETITIONER COMMENT**

**The April 15 Report never denies that it could achieve 6 percent annual reductions of CO2 emissions and it fails to provide any analysis on what the benefits of these reductions would be.<sup>75</sup>**

#### **DEPARTMENT RESPONSE**

The Department's analysis of the Petition for Rulemaking did review the efficacy of the proposal and determined that the benefits would be negligible. The Department's entire analysis

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<sup>74</sup> April 15 Report at 8.

<sup>75</sup> Petitioner's Reply at 8.

was set forth in the April 15 Report.<sup>76</sup> As shown in Figure 4, by completely removing Pennsylvania's emissions from global totals, the calculated global concentration would be, at a maximum, only 0.014 percent lower than the actual global concentration as seen in Year 2011. This maximum is assuming a 100 percent reduction, which is more than the approximately 90 percent reduction based on the Petition for Rulemaking.

**Figure 4. Pennsylvania's Emissions as a Measure of Global Concentrations**

Year	Pennsylvania's Emissions of CO <sub>2</sub> e (in kg)	Pennsylvania's Emission of CO <sub>2</sub> e that Remains in the Atmosphere (in kg)	Change in Mass of CO <sub>2</sub> in Atmosphere Without Pennsylvania's Contribution (in kg)	Concentration Without Pennsylvania (in ppm)	Pennsylvania's Share of the Concentration
2009	2.43E+11	9.55E+10	1.16E+13	386.91	0.03 0.008%
2010	2.54E+11	1.04E+11	1.21E+13	388.47	0.03 0.008%
2011	2.62E+11	1.81E+11	2.13E+13	391.19	0.06 0.014%
2012	2.68E+11	1.22E+11	1.45E+13	393.08	0.04 0.010%
2013	2.74E+11	1.57E+11	1.88E+13	395.49	0.05 0.012%

Moreover, the Department's analysis shows that the strategies it has in place are reducing GHG emissions in a consistent manner. The Department's analysis further shows that the Department is continuing to develop GHG emission strategies. The most recent of these relates to U.S. EPA's Clean Power Plan under Section 111(d) of the Clean Air Act, as described above. If the proposal is finalized in its present form, U.S. EPA would issue "emission guidelines" and identify the "best system of emission reduction" for CO<sub>2</sub> and fossil fuel-fired EGUs. A

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<sup>76</sup> April 15 Report at 53.

comprehensive nationwide approach, if designed correctly, is far preferable than the piecemeal approach proposed by the Petitioner.

**PETITIONER COMMENT**

**The DEP argues that annual reductions in Pennsylvania of 6 percent would not achieve the purpose of the Petition because reductions in Pennsylvania's emissions alone cannot achieve a safe concentration of CO<sub>2</sub> in the atmosphere. This mischaracterizes the purpose of the Petition, which is to have the DEP promulgate a rule that would require reductions of CO<sub>2</sub> by 6 percent a year. The Petition does not seek to have Pennsylvania singlehandedly restore the concentration of CO<sub>2</sub> in the atmosphere to 350 ppm. The language in the Petition about restoring the global concentration of CO<sub>2</sub> to 350 ppm by the end of the century was used to develop a prescription to determine the amount of annual reductions required by Pennsylvania (and other states and countries), and that amount was determined to be 6 percent. DEP's throwing up of its hands and advocating doing nothing is a complete abdication of the Commonwealth's public trustee duties mandated by Article I, Section 27.<sup>77</sup>**

**DEPARTMENT RESPONSE**

The Department understands the approach advocated by the Petitioner, but the Department's position remains that the proposed regulatory approach to reduce GHG emissions would be ineffective in achieving the regulatory goal. It follows that it would be unreasonable for the Department to recommend that the EQB pursue an ineffective regulatory approach. The Department is unwilling to recommend that the EQB establish the type of program advocated by

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<sup>77</sup> Petitioner's Reply at 25.

the Petitioner, which will not reduce GHG emissions in a meaningful and measurable way. The Department is not aware of, and the Petitioner has not cited evidence of, any state reducing its GHG emissions by 6 percent a year through 2050. Moreover, the approach advocated by the Petitioner was rebuffed in certain judicial districts related to its attempt to force a piecemeal regulatory approach. Furthermore, as the Department noted, there is no consensus that the 350 ppm atmospheric CO<sub>2</sub> concentration advocated by the Petitioner is the proper standard to stabilize or reduce GHG emissions. The 5<sup>th</sup> Assessment Report of the IPCC does not advocate or defend any threshold.

In short, the Department has already established a comprehensive GHG reduction strategy that touches all of the major GHG emitting source categories in Pennsylvania. The Department is unwilling and unable to recommend to the EQB that it develop a regulatory program, advocated by the Petitioner, which will not work. But as a trustee of the public natural resources in Pennsylvania, the Department, together with other trustees, is advocating and implementing balanced cost-effective GHG emission reduction programs. Those programs have resulted in real GHG emission reductions. Moreover, the Department will be implementing additional reduction strategies as described above. Additionally, the 2013 Update also identifies nine different actions that the Department recommends to the Pennsylvania Legislature to further reduce GHG emissions.

## **F. DEPARTMENT'S RECOMMENDATION**

As the Department noted in its April 15 Report, the science identified in the 2009 Plan, 2013 Update, and the Petition for Rulemaking recognizes climate change as a global issue that requires a comprehensive response. However, the suggested regulatory language in the Petition for Rulemaking fails to recognize that, in order to achieve a safe atmospheric concentration of CO<sub>2</sub>, or a CO<sub>2</sub> atmospheric concentration of 350 ppm, the remedy must be national and global in nature. The Petition for Rulemaking focuses on one discrete aspect of the issue (i.e., fossil fuel-fired sources) in one particular location (i.e., Pennsylvania). Consequently, the particular mechanism advocated in the Petition for Rulemaking (i.e., a 6 percent reduction in fossil fuel-fired sources in Pennsylvania) cannot achieve the particular remedy advocated for in the Petition for Rulemaking (i.e., a safe atmospheric concentration of CO<sub>2</sub> or a CO<sub>2</sub> atmospheric concentration of 350 ppm by 2100). This is particularly true because, as the April 15 Report notes, by totally removing Pennsylvania's emissions from global totals, the calculated global CO<sub>2</sub> concentration would only be 0.014 percent lower than the actual global concentration.

Moreover, as the Department noted, there is no consensus that the 350 ppm metric advocated by the Petitioner is the proper standard to meet. The 5<sup>th</sup> Assessment Report of the IPCC does not advocate or defend any threshold. As a result, the latest science does not support that an atmospheric concentration of 350 ppm is the most optimal level necessary to stabilize the climate. As the IPCC itself notes, it is thus not possible to define a single critical threshold without value judgments and without assumptions on how to aggregate current and future costs and benefits.

The Department acknowledges that it has an important role as trustee in protecting and preserving the rights and values contained in Article I, Section 27 of the Pennsylvania

Constitution. However, protection of the atmosphere requires the efforts of multiple trustees not to mention participation by the public - in this Commonwealth, nationally, and around the world. Nonetheless, the Department plays a substantial role, within the scope of its legal authority and with a balanced approach to sustainable development, in reducing CO<sub>2</sub> emissions. As such, the Department in its April 15 Report of the Petition for Rulemaking identified a number of concrete actions that the Department and other Commonwealth trustees like the Department of Agriculture and PUC are taking to reduce CO<sub>2</sub> emissions in Pennsylvania. Overall, Pennsylvania's gross GHG emissions are expected to be lower in 2020 than in 2000, with reductions in the residential, commercial, transportation, agriculture and waste sectors. The total statewide emissions sinks are also expected to increase, creating additional net GHG benefits through 2020.

The Petitioner also ignores the fact that on June 2, 2014, U.S. EPA proposed its Clean Power Plan under Section 111(d) of the Clean Air Act to cut carbon emissions by 30 percent nationwide by 2030. Once finalized, the Department will need to comply with this requirement. A comprehensive nationwide GHG emission reduction strategy, if designed correctly, is more effective than the piecemeal state-by-state approach advocated by the Petitioner.

As a result of its April 15 Report, the Petitioner's Reply and the Department's Response to that Reply, the Department recommends that the EQB not move forward with the Petition for Rulemaking.