these three crops (2000 dollars) of $12 billion to $35 billion.[695] Another recent study included damage to rice (3-4% reduction in yield for year 2000) and finds even higher total costs for year 2000 ($14 billion to $26 billion).[696] Many other crops are damaged by ozone, so these estimates only capture a portion of the economic damage to crops from ground-level ozone. The value of avoiding a portion of these damages by reducing methane emissions must be considered in valuation of methane reductions.

Avnery *et al.*[697] report work underway to examine the benefits to crop yields from methane mitigation. This study, which will provide an estimate of the value of increased crop yields resulting from avoided ozone damages resulting from methane emission reductions, is currently under peer-review for publication in a scientific journal. We will submit this study as soon as it has been accepted for publication, so that EPA may consider it in order to provide a more accurate valuation of methane reductions.

Damages to human health and crops from ozone produced by methane emissions are independent of damages to human health and welfare resulting from the temperature increases and other negative consequences of climate change due to methane emissions.[698] Thus, a full accounting of benefits from methane reductions must include the sum of the climate-related benefits discussed above and the ozone-related health and crop yield benefits.

VIII. INDUSTRY GROWTH AND RIGOROUS CLEAN AIR REGULATIONS CAN GO HAND IN HAND

Despite the clear economic benefits of EPA's rules, we expect some commenters to argue that the rules will restrain the industry's growth. On the contrary, as we demonstrate below, air quality standards are compatible with successful natural gas expansion efforts.

A. Experience from Colorado and Wyoming, where industry has grown in the presence of strong standards.

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[695] Avnery, S, D.L. Mauzerall, J. Liu, and L.W. Horowitz (2011) "Global crop yield reductions due to surface ozone exposure: 2. Year 2030 potential crop production losses and economic damage under two scenarios of O_3 pollution," *Atmos. Env.*, 45, 2297-2309, attached hereto as Exhibit 234.

[696] Van Dingenen, R, F.J. Dentener, F. Raes, M.C. Krol, L. Emberson, and J. Cofala, (2009) "The global impact of ozone on agricultural crop yields under current and future air quality legislation," *Atmos. Env.*, 43, 604-618, attached hereto as Exhibit 235.

[697] Avnery, S, D.L. Mauzerall, J. Liu, and L.W. Horowitz (2011) "Global crop yield reductions due to surface ozone exposure: 1. Year 2000 crop production losses and economic damage," *Atmos. Env.*, 45, 2284-2296.

[698] These negative consequences from emissions of methane, independent of climate change, could be included in integrated assessment models used in the calculation of SCM. However, the model used by Marten and Newbold (see above) does not include these damages, so they must be added to the SCM. If the present benefit of methane reductions is calculated by multiplying the social cost of carbon by a global warming potential (see above) then damages independent of climate change inherently must be added, as that method cannot capture damages independent of climate.

EPA's proposed standards are similar to existing state-level regulations in Colorado and Wyoming, where compliance has not only been accomplished, but has been accompanied by rapid growth in the oil and natural gas industries. As John Corra, Director of the Wyoming Department of Environmental Quality, recently told a Department of Energy advisory panel on natural gas issues, thanks to several years of protective air emission limitations, the number of wells and gas production in active parts of WY have gone up, while air emissions have gone down.[699]

We have examined several metrics illustrating trends in the oil and natural gas sectors which show that both Colorado and Wyoming have experienced growth in those industries while meeting state air regulations, and in some cases, higher growth than both the U.S. overall and other states without such regulations. While this analysis does not quantify the impact of the regulations, (since we do not know what sort of growth these states might have seen in their absence), it does provide evidence that industry can thrive in the presence of these regulations.[700]

B. Regulatory Background in Colorado and Wyoming

Regulations to control emissions of VOCs and HAPs from oil and natural gas operations have been in place in Wyoming for over a decade and in Colorado since 2004. WY first introduced regulations for minor source crude oil, gas, and condensate production sources in October 1995. In 1997, the state lowered the applicability threshold for its minor source permitting program in response to "prospects of increased natural gas development in Southwest Wyoming and other parts of the state."[701] Wyoming promulgated presumptive best available control technology (BACT) guidance requiring oil and gas production facilities to control VOCs and HAPs associated with flashing losses from pressure vessels and storage tanks on January 6, 1999.[702] These requirements applied to new wells and recompletion or stimulation projects. WY subsequently strengthened its BACT requirements, first in August 2001 and again in 2004 and 2007, increasing the source types covered and stringency - with the most recent revision in March 2010. The current presumptive BACT guidance requires differing levels of control of emissions from well completions, pneumatic controllers and pumps, glycol

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[699] See video of the July 13, 2011 meeting of the Natural Gas Subcommittee of the Secretary of Energy's Advisory Board; Mr. Corra's presentation starts near the mid-way point. www.shalegas.energy.gov/media/Meeting_071311_Afternoon.html

[700] While this analysis does provide evidence that industry can thrive in the presence of regulation, it is important to understand its limitations. For example, there are a number of additional factors that may contribute to relative growth between states that have not been examined here. These factors include (but are not limited to) the relative potential between states for growth in terms of physical availability or access to resources, as well as general economic health at the local/regional level.

[701] http://deq.state.wy.us/aqd/Oil%20and%20Gas/052297.pdf, attached hereto as Exhibit 236

[702] http://deq.state.wy.us/aqd/Oil%20and%20Gas/oglette.pdf. Although we discuss the substance and effect of Wyoming's presumptive BACT regulations, we do not endorse the presumptive BACT concept as a matter of policy and law.

dehydrators, flash emissions from storage vessels, and separation vessels, depending on the location of the operations. More stringent requirements apply in areas of intense development, e.g. concentrated areas of development and in the immense Jonah and Pinedale Anticline development areas.

Colorado first introduced rules to limit emissions of VOCs and NO_x from oil and natural gas exploration and production facilities in ozone non-attainment (NA) areas in March 2004. Specifically, Regulation No. 7 required control of emissions from condensate operations with the potential for flash emissions, glycol dehydrators, gas processing plants and reciprocating internal combustion engines. In December 2006, Colorado revised Regulation No. 7 to require a greater level of control for condensate tanks located in the Denver metro ozone nonattainment area, and extended controls for dehydrators and condensate tanks statewide. In December 2008, Colorado added a requirement to control emissions from pneumatic devices located in ozone nonattainment and maintenance areas and extended the requirements to control NOx emissions from reciprocating internal combustion engines statewide. In 2009, the Colorado Oil and Gas Conservation Commission (COGCC) promulgated additional rules that have the effect of reducing emissions from glycol dehydrators and storage tanks located in the Piceance basin and well completions and pneumatic devices located statewide. These rules took effect in the spring of 2009.

C. Growth Trends

There are a number of possible metrics that can be used to measure the growth trends in the oil and natural gas industries in these states—we've focused on three data sets: operational rotary rig count, producing natural gas wells, and natural gas gross withdrawals. Data on rig count is from Baker Hughes and is available through 2010; data on gas wells and withdrawals is from the U.S. Department of Energy's Energy Information Administration (EIA) and is available through 2009.

D. Operational Rig Count

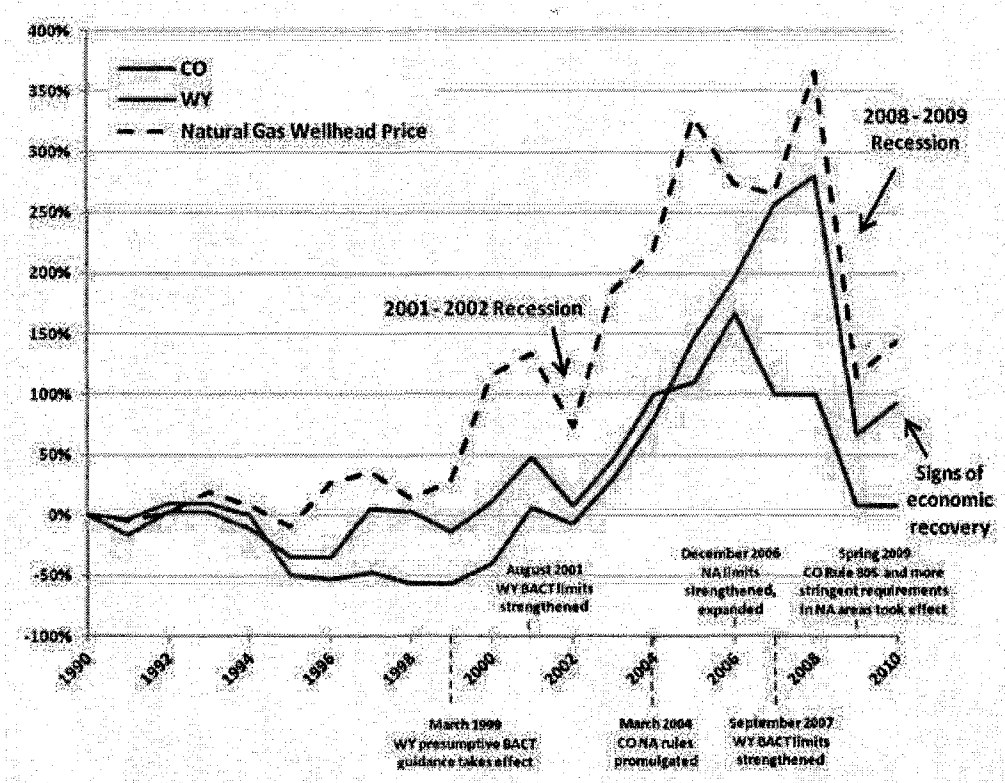
The data show that rig counts in Colorado and Wyoming have shown significant growth during the years of regulation, in some cases even higher than other states which do not have such regulations.[703] Colorado's growth has been particularly high, with an average annual growth rate over the 2000-2010 period of nearly 21%, higher than states such as Texas, Oklahoma, New Mexico, and Louisiana (states without similar air regulations) – this figure is also higher than the overall U.S. annual growth rate of about 12%.

[703] According to Headwater Economics, rig count serves as a good proxy for economic trends, and in particular, employment trends, since the majority of oil and gas industry jobs are associated with the drilling phase. Headwaters Economics, "Drilling Rig Activity Nears Twenty-Year High: Price and Technology Remain Key Drivers of Oil and Gas Drilling Activity", http://headwaterseconomics.org/wphw/wp-content/uploads/RigCounts.pdf (10 June 2011), attached hereto as Exhibit 237.

Colorado's rig count in 2010 was about triple what it was in the year 2000, while overall U.S. rig count did not quite double. The state's rig count growth is particularly high in the few years after 2004, exactly the year that the Regulation No. 7 rules went into effect.

While Wyoming's rig counts decrease following 2006, the data shows a generally increasing trend over the previous ten years during which regulations of some form were in place in the state, suggesting that rig counts are more responsive to factors other than regulation. Indeed, the trend in rig count in both Wyoming and Colorado closely follows that of natural gas prices, and shows notable decreases in the presence of a recession (e.g. 2001-2002, 2008-2009) – factors which appear to impact rig count more than the presence of regulation (see Figure 1). More recently, between 2009 and 2010, Wyoming's rig count leveled out, and Colorado showed signs of recovery, with a 16% increase in number of rigs.

Figure 8: Growth in Number of Rigs in WY and CO and Natural Gas Price Relative to 1990[704]



Sources: Based on rig count data from Baker Hughes[705] and natural gas wellhead price data from EIA.[706]

E. Permit Applications

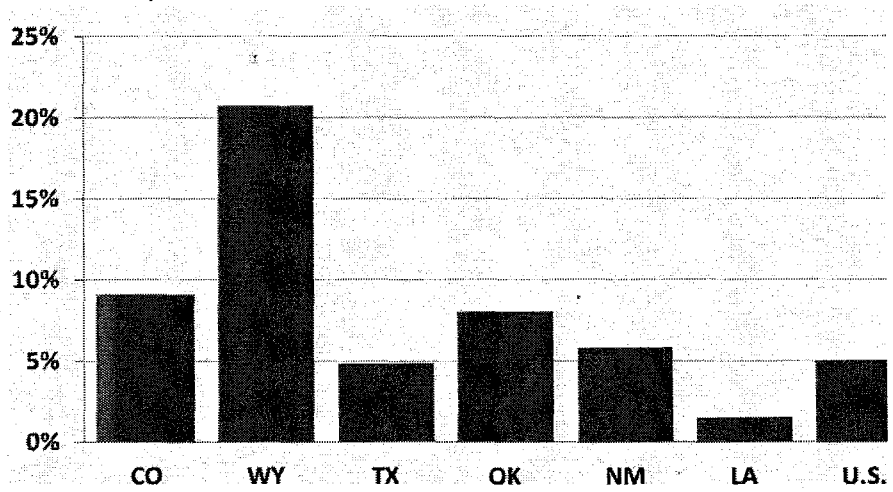
Industry activity can also be represented through the number of permit applications for oil and natural gas development projects. In WY, for instance, a number of very large oil and gas projects are poised for approval on federal lands. The Bureau of Land Management (BLM) is currently preparing environmental impacts statements for the nearly 9,000-well Continental Divide Creston project, the 4,208 well Hiawatha project, the 1,861-well Moxa Arch project, the 3,500-well Normally Pressured Lance project, and the 838-well LaBarge Platform project.[707] All of these projects are moving forward while in the presence of WY rules regulating emissions from the oil and gas sector.

F. Producing Natural Gas Wells and Gross Natural Gas Withdrawals

[704] 1990 was selected as the base year, as a year with all data available and early enough to be unaffected by the introduction of the first regulations on the oil and natural gas industries in Wyoming in 1995.
[705] http://investor.shareholder.com/bhi/rig_counts/rc_index.cfm, attached hereto as Exhibit 238.
[706] http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_nus_a.htm, attached hereto as Exhibit 239.
[707] http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA.Par.24843.File.dat/hot_sheet.pdf, attached hereto as Exhibit 240.

Colorado and Wyoming similarly show strong growth when considering other metrics: producing natural gas wells and gross natural gas withdrawals. In terms of the number of producing gas wells, they show the highest annual growth rates of the states examined with about 9% and 21% average annual growth rates respectively during the period 2000 to 2009, and higher than the average annual growth rate for the U.S. overall at 5% (see Figure 2).[708]

Figure 9: Average Annual Growth of Producing Natural Gas Wells in Selected States and the U.S., 2000-2009



Sources: Based on data from EIA.[709]

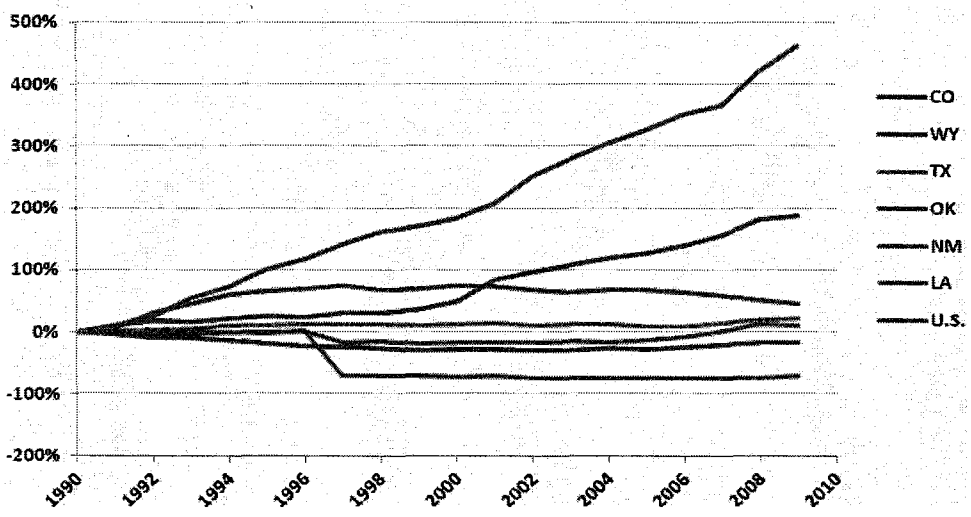
Similarly, the two states also have the highest annual growth rates for gross withdrawals, both with average annual growth rates of about 8% over the same period, and higher than the overall U.S. growth rate of 1%.[710] Figure 3 shows that Colorado and Wyoming experienced more rapid growth in gas production than other selected states without similar regulations as well as the U.S. overall when examining the growth in withdrawals relative to 1990.

[708] Compared to 5%, 8%, 6%, and 2% for Texas, Oklahoma, New Mexico, Louisiana, (all states without similar state regulations), respectively.

[709] http://www.eia.gov/dnav/ng/ng_prod_wells_s1_a.htm, attached hereto as Exhibit 241.

[710] Compared to 3%, 2%, -2%, and -0.1% for Texas, Oklahoma, New Mexico, Louisiana (all states without similar state regulations), respectively.

Figure 10: Growth in Natural Gas Gross Withdrawals in Selected States and the U.S. Relative to 1990



Sources: Based on data from the EIA.[711]

The increase in the economic value of the oil and natural gas withdrawn in these states is also a strong indicator of the economic health of these states' oil and gas industries. For example, in 2010 the total value of taxable minerals in Wyoming was $15.5 billion, up 23% from 2009 and second only to the production value in 2008. The taxable value of oil production in Wyoming was $3.27 billion in 2010, up 34% from 2009, and the taxable value of natural gas production was $7.6 billion, up nearly 30% from 2009. [712]

Again, while we cannot quantify the impact of the regulations in Colorado and Wyoming, the bottom line is that CO and WY have shown considerable growth in these industries throughout the years of regulation—regulation comparable to the EPA's proposed federal rules. EPA's proposed rules therefore are not likely to impair the industry's growth; they will, instead, reduce the environmental impacts of that growth.

IX. EPA MUST PROMULGATE THE FINAL STANDARDS NO LATER THAN APRIL 3, 2012

Some oil and gas industry interest groups have asked EPA to delay implementation of the new source performance standards, in some instances, for up to one year.[713] We strongly oppose such requests. First they are contrary to the statute, which requires new sources on which construction is commenced after the date on which new standards are *proposed* to meet the standards once they begin operations.[714] Furthermore, EPA has already agreed to delay promulgation of the final rule to April 3,

[711] http://www.eia.gov/dnav/ng/ng_prod_sum_dcu_NUS_a.htm.
[712] http://taxappeals.state.wy.us/2011%20Abstract%20and%20Mill%20Levy%20Report.xls.
[713] For example, in a public announcement describing the rules as "reasonable" API requested an additional year to comply. SNL Daily Dose, Gas Edition, Sept. 28, 2011.
[714] 42 U.S.C. §§ 7411(a)(2), 7411(b)(1), 7411(e).