



I. Introduction

Arkansas provides the outdoor enthusiast with a gamut of recreational opportunities. Whether it be kayaking Class V whitewater creeks into the first national river of the United States, rock climbing in “Horseshoe Hell,” mountain biking the notorious “trails of Oz,” hunting the “Duck Capital of the World,” or relaxing in naturally occurring ancient thermal springs the Natural State is an environmentalist’s Mecca. Mere hours separate an expansive river delta, home to thousands of wetland plant and animal species, from the (comparatively) towering Ozark mountain range, with its abundance of trout, elk, and black bear. Growing up in a place like this, it is hard not to develop a profound appreciation for the natural environment and all its wonders—and a fervent desire to preserve it for the enjoyment of future generations.

Unfortunately, it does not take a savant to realize that climate change has the potential to upend all of it, destroying all the splendors of a diverse, healthy, and balanced

natural climate provides.









global environment.”<sup>31</sup> Since then, sustainability and the mitigation of climate change have increasingly become central policy concerns of the United States. Indeed, President Bush’s statement was almost immediately followed by Congress’s passing of the Energy Policy Act of 1992, aiming to reduce U.S. dependence on fossil fuels by encouraging the use of, and investment in, renewable energy sources<sup>32</sup>. Under the next administration, President Bill Clinton promulgated environmentally-friendly executive orders throughout his tenure<sup>33</sup> and even signed the United States onto the Kyoto Protocol—an international agreement which would have required massive cuts in GHG emissions<sup>34</sup>.

Although the George W. Bush administration was notoriously regressive on climate change<sup>35</sup> during his tenure, Congress continued to pass environmentally





### III. The Netherlands Concept

Currently, neither any of the fifty states nor the federal government implement anything like the proposed Carbon Credit Bonus. The Netherlands, on the other hand, employs a similar approach. On all public highway construction projects in the Netherlands, the Rijkswaterstaat (“RWS”)—the Dutch governmental body responsible for infrastructure—utilizes a bidding methodology referred to as “the most economically advantageous tender (MEAT).”<sup>48</sup> Under MEAT, the RWS is required to consider sustainability when evaluating contractors’ bids.<sup>49</sup> In assessing the sustainability of each bid, the RWS focuses on CO<sub>2</sub> emissions.<sup>50</sup>

The RWS does this by using a tool known as the “CO<sub>2</sub> Performance Ladder.”<sup>51</sup> The CO<sub>2</sub> Performance Ladder has five levels, ascending from 1 to 5.<sup>52</sup> For participating companies, a centralized agency known as the Ladder Certification Institution (“LCI”) reviews the organization’s documents, business practices, technologies, etc. and assigns the company a level on the ladder corresponding to the amount of CO<sub>2</sub> the company emits.<sup>53</sup> For example, a company that emits relatively little CO<sub>2</sub> and employs proven CO<sub>2</sub> reduction strategies and practices is assigned to Level 5 (subject to annual audits by the LCI), whereas a company that emits heavily and is just beginning to explore CO<sub>2</sub> reduction strategies is assigned to Level 1.<sup>54</sup> Then, in submitting bids on highway construction projects, certified bidders have their bid price reduced by a percentage corresponding to their certificate level (i.e., a Level 1 contractor has its bid reduced by 1%, Level 2 by 2%

and so on) for a maximum reduction of 5%<sup>55</sup>. Once the bid is awarded, the requirements of the





occasionally even leading to price collapses.<sup>70</sup> The U.S. sulfur dioxide (“SO<sub>2</sub>”) market is a perfect example. “At one point, SO<sub>2</sub> emissions allowances traded for over \$1600 per ton before dropping to less than \$3 per ton.”<sup>71</sup> Indeed, the EU ETS CO<sub>2</sub> price has crashed multiple times.<sup>72</sup> In the past year alone, it has more than doubled.<sup>73</sup>

Additionally, the cap-and-trade system is highly complex. If policymakers do not provide enough CO<sub>2</sub> allowances, the price of CO<sub>2</sub> soars. However, if they provide too many allowances, “the price of CO<sub>2</sub> drops and the market disintegrates.”<sup>74</sup> If the price per ton of CO<sub>2</sub> on a project is tied to an existing cap-and-trade market, policymakers will have extremely limited control and there will be no certainty tied to the

The Social Cost of Carbon is an estimate developed by a federal interagency working group ("IWG") designed to put a precise dollar figure on the long-term damage done by one ton of CO<sub>2</sub> emissions today.<sup>76</sup> It is the:

monetary value of the net harm to society associated with adding a small amount of [CO<sub>2</sub>

In developing its Social Cost of Carbon estimates, the IWG utilizes “an ensemble of three widely cited integrated assessment models (IAMs) that estimate global climate damages using highly aggregated representations of climate processes and the global economy combined into a single modeling framework.”<sup>82</sup> In addition to relying on multiple highly acclaimed climate models, the IWG has constantly solicited public comments and refinements from the most knowledgeable climate experts in the world in order to ensure its estimates are accurate. For example, in 2015, “the IWG asked the National Academies of Sciences, Engineering, and Medicine to conduct a multi-discipline, two-phase assessment of the IWG estimates and to offer advice on how to approach future updates to ensure that the estimates continue to reflect the best available science and methodologies.”<sup>83</sup>

created their own or incorporated the federal Social Cost of Carbon into their regulatory cost-benefit analyses.<sup>87</sup> Beyond that, much like the proposed Carbon Credit Bank, both New York and Illinois already use the Social Cost of Carbon to put a price on CO<sub>2</sub> emissions. Indeed, both of these states use the Social Cost of Carbon to put a dollar figure on “zero-emission credits” paid to electric utilities under their respective states’ clean energy legislation.<sup>88</sup>

In New York, for example, qualifying nuclear power plants are awarded “state created and state-issued credits certifying the zero-emission attributes of electricity [they] produce[.]”<sup>89</sup> These credits, known as “zero-emissions credits” then operate as subsidies for participating nuclear plants in that the State allows the plants to sell the credits at a price tied to the Social Cost of Carbon.<sup>90</sup> The New York Independent System Operator, Inc. (“NYISO”), the organization responsible for managing New York’s electric grid and its competitive wholesale electric marketplace has heaped extraordinary praise on pricing CO<sub>2</sub> using the Social Cost of Carbon and providing private firms with incentives in this







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innovations—yielding a perpetual feedback loop of climate friendliness in road construction.

Moreover, in developing a baseline, agencies should assume “best scenario emissions.” This means that for the particular product, process or system at issue, the agency should assume the baseline emissions are those of a best practices contractor.

This assumption will make it harder for contractors to show that

literacy,” meaning that government agencies will become carbon-educated by understanding how much CO<sub>2</sub> is associated with different products, processes, and systems throughout the course of projects<sup>110</sup>. This, in turn, will make it far easier for state and local governments to implement initiatives designed to reduce CO<sub>2</sub> because their employees will be well versed in the jargon and strategies, and there will be existing databases documenting best practices for CO<sub>2</sub> reductions. This contributes significantly to accurate, reasonable, and tangible policy actions that actually achieve CO<sub>2</sub> reductions. Finally, accounting for the CO<sub>2</sub> emissions on a project before it begins will help policymakers determine its comprehensive costs to society.

## VI. The Carbon Credit Bonus

Unlike building construction, heavy highway work presents a unique challenge. In the building sector, progressive owners can embrace CO<sub>2</sub> reductions via LEED certification, selecting alternative designs and materials, seeking out the assistance of design professionals who specialize in sustainable architecture, etc. Take, for example, the University of Arkansas's recent construction of Adohi Hall using cross laminated timber, a material that can reduce CO<sub>2</sub> emissions by up to 80% of its concrete counterpart.<sup>111</sup>

This does not translate well to highway projects, where contractors are dealing with dirt, concrete, steel, and asphalt—period. Indeed, highway contractors have operated in much the same way throughout their existence—all that has really changed is the technology related to the speed of construction. This has allowed them to develop

economies of scale and maintain their competitiveness in their respective markets. These contractors are not going to change their behavior and adopt CO<sub>2</sub> reductions strategies unless they either (1) have to adapt to become more competitive or (2) have to adapt to avoid some governmental penalty. It does not require decades of social science to know that people respond more favorably to incentives than penalties—in comes the Carbon Credit Bonus.

State and local transportation agencies across the United States should implement a Carbon Credit Bonus in public highway construction contracts. They could do so by adding a provision into the contract—modeled on existing contract bonus structures for early completion<sup>112</sup>—providing that, at the end of the project, the contractor will be awarded a Carbon Credit Bonus in the amount of the tons of CO<sub>2</sub> reduced times the Social Cost of Carbon. Importantly, contractor participation would be totally optional—contractors do not have to participate unless they elect to do so. Indeed, nothing about the bidding process will need to change and



using alternative fuels for asphalt plants, biofuels for dump trucks, electric vehicles, “warm-mix” asphalt, fly ash, incorporating recycled materials, minimizing hauling distances, etc. Whatever the contractor decides to invest in will incentivize efficiency and CO<sub>2</sub> reducing innovation.

Upon completion of the project, the contractor must have an independent entity certify the project with a “carbon declaration.” This independent account would tally the contractor’s total CO<sub>2</sub> emissions for the project as built, using the same tool and assumptions as the State and compare this number to the baseline. The difference between the State baseline and the carbon declaration would then become the basis for the bonus payment. Prior to paying the bonus, the State would be entitled to an opportunity to verify the carbon declaration. As a further deterrent from falsifying records, all false claims could be subjected to a serious penalty similar to those under the federal False Claims Act such as treble damages<sup>116</sup>. After verification, the State employee or consultant will multiply the tons of CO<sub>2</sub> emissions saved by the Social Cost of Carbon. The



The following table provides several examples of what a real-world Carbon Credit Bonus would look like, using past highway infrastructure jobs from three different states: Arkansas<sup>118</sup>, Texas<sup>119</sup>, and California.<sup>120</sup> Arkansas was chosen as it is the home state of the author. Texas and California were chosen because they are both renowned for their massive infrastructure projects, and they are in very different areas of the United States. While these jobs are not a representative sample of the entire country, their wide variety in terms of both geography and scope demonstrates the wide-ranging application of the Carbon Credit Bonus. The estimated baselines were calculated in metric tons of CO<sub>2</sub> ("MTCO<sub>2</sub>") using the Project Emission Estimator tool.<sup>121</sup> Importantly, these calculations are only rough estimates based on information provided in the bid documents. The true measure of CO<sub>2</sub> emissions can vary depending on what assumptions are made when inputting data into the estimating tool. This is why it is important that a State employee or consultant is calculating the baseline in the same way every time. Because there is a certain degree of subjectivity going into the estimations, this allows policymakers to establish higher or lower baselines depending on the particular State's policy preferences.

Agency	Job No.	Contract Amount	Job Description	Lane Miles	Estimated Baseline (MTCQ)	Social Cost of Carbon	5% Contract Bonus	Carbon
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certification cost to contractors. Indeed, nothing about the competitive bidding process or contract administration will materially change—participation in the Carbon Credit Bonus program will be voluntary for highway contractors

## VII. Conclusion

Twenty of the warmest years on record have occurred in the last twentytwo years.<sup>125</sup> In 2019, in response to rising sealevels, Indonesia announced plans to move its capital city of Jakarta—home to ten million people—to a different island.<sup>126</sup> In 2020—the hottest year on record<sup>127</sup>—the concentration of CO<sub>2</sub> in the atmosphere was the highest it has been in human history.<sup>128</sup> 2020 also set an annual record of twentytwo climate disaster events with losses exceeding \$1 billion to the United States, “shattering the previous annual record of 16 events that occurred in 2011 and 2017!<sup>129</sup> This compared to an annual average of only 7.1 events between 1980 and 2020.<sup>130</sup> The point is this: the

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commensurate with the annual energy consumption of households in a state comparable in size to Illinois or Pennsylvania can be achieved.<sup>182</sup>

The Carbon Credit Bonus is the perfect three-legged stool by which state and local transportation agencies can incentivize highway contractors to pursue drastic CO<sub>2</sub> reductions such as this. First, the Carbon Credit Bonus serves the public good. It requires government agencies to calculate a CO<sub>2</sub> emissions baseline on all their projects, thereby ensuring the government is aware of the true costs to society of all highway infrastructure projects. In requiring the calculation of this baseline, it contributes to government carbon literacy, ensuring that policymakers implement accurate, reasonable, and tangible policy actions that actually achieve CO<sub>2</sub> reductions. Moreover, it reduces CO<sub>2</sub> emissions in the construction industry, and provides

researching and developing climate-friendly materials, methods, technologies, and systems. Third, and finally, the Carbon Credit Bonus ensures consumers get better, more climate-friendly products, and for better prices

The United States has some of the best scenic drives in the world. Whether one is heading down “the pig trail” in Arkansas in the fall, cruising through tunnels of vibrant autumn foliage to a Razorback football game snaking past steep seacliffs, lush with blooming mango trees rising out of pristine turquoise pools on the famous Hana Highway in Hawaii; twisting through hundreds of miles of Appalachia along the Blue Ridge Parkway, filled with undulating slopes of color and unparalleled panoramic overlooks or driving awe-struck along the Great River Road, marveling at the might of the Mississippi River and stopping to stare at the nation’s largest alluvial plain, one lesson can be drawn from this experience: highway construction and the natural environment are not mutually exclusive. A better environment means better business. While environmentalists and highway



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<sup>19</sup> Cass & Mukherje, supranote 12, at 1015 IkHOL M5. e ,



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<sup>34</sup> Signing the Kyoto Protocol WHITE HOUSE GREEN BLDG., Si See, 0 Te. 0 g. 0. 1 J 0 mggt Rencr

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<sup>51</sup> How to Use the CD

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<sup>80</sup> Shelinski & Obstfeld, *supra* note 76.

<sup>81</sup> TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON, *supra* note 25.

<sup>82</sup> *Id.*

<sup>83</sup> *Id.*

<sup>84</sup> Exec. Order No. 13,783, 82 Fed. Reg. 16,093 (Mar. 28, 2017). Despite President Trump's ~~issu~~bandment of the IWG, the Social Cost of Carbon remained in effect.

<sup>85</sup> Exec. Order No. 13,990, 86 Fed. Reg. 7,037 (Jan. 20, 2021). Under the Biden administration, the IWG is directed not only to develop a Social Cost of Carbon, but also a Social Cost of Methane and Social Cost of Nitrous Oxide, all of which have been combined to form the Social Cost of Greenhouse Gases. TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON, *supra* note 25. However, for simplicity's sake, this Article is limited to ~~the~~ <sup>the</sup> of the Social Cost of Carbon.

<sup>86</sup> TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON, *supra* note 25.

<sup>87</sup> See, e.g. States Using the SCOST. FOR POL'Y INTEGRITY, <https://costofcarbon.org/states> (last visited Apr. 24, 2021) (exhibiting initiatives from 11 different states using the federal Social Cost of Carbon or a State equivalent).

<sup>88</sup> See generally Order Nos. ~~E~~50302, ~~E~~16E-0270 (N.Y. PSC Aug. 1, 2016). I.Pub. Act 099

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<sup>110</sup> Fernando Correia et al., Low Carbon Procurement: An Emerging Agenda, PURCHASING & SUPPLY MGMT. 58 (2013).

<sup>111</sup> Sydney Franklin, America's Largest Mass Timber Building Opens at the University of Arkansas, ARCHITECT'S NEWSPAPER (Nov. 25, 2019), <https://www.archpaper.com/2019/11/adding-university-of-arkansas-sodra-s-cross-laminated-timber-reduces-carbon-footprint-up-to-80-percent/>; Södra's Cross-laminated Timber Reduces Carbon Footprint Up to 80 Percent, BIOENERGY INT'L (Feb. 5, 2021), <https://bioenergyinternational.com/biochemicals/materials/sodra-cross-laminated-timber-reduces-carbon-footprint-by-up-to-80-percent>

<sup>112</sup> These early completion bonuses are widely used by state and local transportation agencies throughout the United States. INT'L COOP. HIGHWAY RSCH. PROGRAM, TIME-RELATED INCENTIVE AND DISINCENTIVE PROVISIONS IN HIGHWAY CONSTRUCTION CONTRACTS 8-10 (2010) (documenting use of early completion bonuses in at least 46 states and the District of Columbia as of 2010).

<sup>113</sup> In other words, unlike the Netherlands approach, the State will not take into account the sustainability of each contractor's proposal in the bidding phase. However, the Carbon Credit Bonus will allow those contractors who can find the best ways to reduce

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<sup>129</sup> Billion-Dollar Weather and Climate Disasters: Overview, NATIONAL OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/billions/#:~:text=The%20U.S.%20has%20sustained%2079,279%20events%20exceeds%20%241.825%20trillion> (last visited Apr. 27, 2021).

<sup>130</sup> Id.  
131