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Reaching the Individual: A Proposed Federal Framework to Reduce Community-Based Greenhouse Gas Emissions

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REACHING THE INDIVIDUAL: A PROPOSED FEDERAL FRAMEWORK TO REDUCE COMMUNITY-BASED GREENHOUSE GAS EMISSIONS

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INTRODUCTION

Federal regimes that aim to reduce greenhouse gas ("GHG") emissions have largely focused on major polluters and energy generators. Market incentives, such as cap and trade programs, and command and control regulatory efforts generally target large industry players. However, this approach ignores the power of shifting behavior at the grassroots level and fails to engage the general public in adopting sustainable practices. The cumulative effect of individual and organizational emissions reductions on a national scale would be significant. A cultural shift of this nature requires more than education and awareness initiatives. Similar to corporations, individuals respond to financial incentives. Such programs have already been implemented, but there is no coordinated regime in place to encourage individual behavior change at the federal or state level.

Federal legislation that encourages states to adopt incentives tailored to geographic and demographic needs could fill this gap. By drawing on principles of cooperative federalism, as in the Clean Air Act, nationwide goals may be achieved through plans devised at the state level. States and local governments are best suited to craft effective programming for their residents. Policies that work well in urban areas may be ineffective in rural communities, and vice versa. The strength of the cooperative federalism approach lies in giving states the flexibility to design and administer programs catered to the needs of local populations, as compared with a one-size-fits-all approach.

This Note will explore existing and potential incentives for grassroots behavior changes and propose a framework to incorporate

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them into a federal regulatory regime using the Clean Air Act as a model. The ideas in this Note will build upon existing literature regarding how the government should address the role of individuals and households in controlling national GHG emissions.

Section I of this Note describes the need for increased engagement of individuals in national climate change efforts and the shortcomings of legislation that focuses exclusively on major polluters. It then explores incentive programs that have been implemented in the United States and Europe, as well as suggestions for novel incentives. Two types of programs will be discussed: those that reach individuals directly, and those that operate via a conduit, such as an employer. This section will also make recommendations based on lessons learned from existing grassroots incentive programs, including the role of geography and demography in crafting effective policies.

Section II of this Note outlines a legislative approach based on the Clean Air Act in which the federal government encourages states to adopt policies that in turn incentivize individuals to reduce their GHG emissions. This discussion will incorporate the incentives outlined in Section I to describe how such legislation could be implemented at the federal and state levels. Thus, Section I lays the foundation for how grassroots incentives could operate, and Section II ties those programs into a holistic federal scheme with an overarching incentive structure.

Section III of this Note discusses policy implications of the proposed legal framework, compliance concerns, potential legal challenges and how those challenges may be addressed. The Note concludes by emphasizing the promise of cooperative federalism as a tool to engage individuals across the country in reducing our collective carbon footprint.

SECTION I: MULTI-SECTOR EFFORTS TO CURB INDIVIDUALS' EMISSIONS

A. The Overlooked Individual

Individual behaviors comprise a large portion of United States pollution and GHG emissions.[1] The cumulative effect of daily

1. John C. Dernbach, *Harnessing Individual Behavior to Address Climate Change*, 26 VA. ENVTL. L. J. 107 (2008); Michael P. Vandenbergh, *The Individual as Polluter*, 35 ENVTL. L. REP. 10723, 10723–24 (2005).

activities, such as driving a car, disposing of garbage, and using electronics, is significant. According to some estimates, carbon dioxide emissions from individuals and households make up one third or more of national GHG emissions.[2] Yet individuals have been largely excluded from domestic and international efforts to abate climate change. Indeed, no environmental statute or regulation recognizes individuals as a source category of pollution or emissions.[3] National environmental laws, such as the Clean Air Act, have targeted industrial polluters, such as power plants and factories, as the largest sources of GHG emissions. Market-based incentives, such as cap and trade programs, focus on major emitters as well. This approach ignores the role individuals can play in reducing national GHG emissions and renders their participation optional. Rather than focusing solely on major polluters, federal and local policies should encourage individuals to contribute to climate change efforts. This Note proposes a holistic regulatory framework that incorporates grassroots participation in reducing national GHG emissions. Scholars have advocated for increased attention to the role of individual GHG emissions, and this Note will contribute to this ongoing discussion by proposing a regulatory solution. In addition to reducing GHG emissions from individuals, this approach may reduce apathy towards climate change and engage the public in important conversations about the future of our planet.

B. Proposed Incentives

This section will describe and analyze the strengths and weaknesses of incentives implemented in the United States and abroad. It will also propose new incentives based on existing models and programs. The incentives discussed target renewable energy, waste diversion, and alternative transportation. According to research from the International Panel on Climate Change, the transportation, buildings, electricity and heat production, and other energy sectors combined comprise fifty-

2. Michael P. Vandenbergh, Jack Barkenbus & Jonathan Gilligan, *Individual Carbon Emissions: The Low-Hanging Fruit*, 55 UCLA L. REV. 1701, 1703 (2008).

3. Vandenbergh, *supra* note 1, at 10724.

five percent of global GHG emissions.[4] In addition, the United Nations reported in 2013 that food waste ranks as the third largest GHG emitter after the United States and China.[5] Food waste discarded in landfills produces methane,[6] a GHG that traps radiation in the atmosphere at least twenty-five times more efficiently than carbon dioxide over a 100 year period.[7] Thus, these sectors should be prioritized when crafting incentive programs. Subsections 1 and 2 will focus on financial incentives that reach individuals directly. Subsection 3 will discuss indirect incentives that use the workplace as a conduit.

1. Energy Conservation

There are some United States government incentives in place to reward certain individual behaviors, but these efforts are scattered and disconnected from each other. Financial incentives to promote clean energy include tax deductions for producing renewable energy and installing energy-efficient appliances. Variations of such policies can be found across the country, along with state grant programs that promote energy-efficient technology and green building design.[8] Depending on one's state, an individual may be eligible for a tax credit or rebate if they install renewable energy systems or energy-efficient appliances in their home.[9] The Internal Revenue Service also offers tax

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4. *Global Greenhouse Gas Emissions Data*, EPA, https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data [https://perma.cc/8TVX-R6NA] (last visited May 16, 2018).

5. FAO, *Food Wastage Footprint: Impacts on Natural Resources Summary Report* 6 (2013), http://www.fao.org/docrep/018/i3347e/i3347e.pdf.

6. *Id.* at 20–22.

7. *Overview of Greenhouse Gases*, EPA, https://www.epa.gov/ghgemissions/overview-greenhouse-gases [https://perma.cc/58EN-9W7J] (last visited May 16, 2018).

8. Mystica M. Alexander, Adam J. Sulkowski & William P. Wiggins, *Sustainability & Tax Policy: Fixing a Patchwork of Policies with a Coherent Federal Framework*, 35 VA. ENVTL. L. J. 1, 7–8 (2016).

9. *Id.* at 13–14; Allison Casey, *Energy Efficiency Tax Credits, Rebates and Financing: What Options are Available for You?*, DOE (March 23, 2015), https://www.energy.gov/articles/energy-efficiency-tax-credits-rebates-and-financing-what-options-are-available-you [https://perma.cc/7ZYC-ZASS]; N.J.'S CLEAN ENERGY PROGRAM, http://www.njcleanenergy.com/main/rebates-and-promotions/rebates-and-promotions [https://perma.cc/GYF5-FQ9W] (last visited May 16, 2018).

credits for purchasers of electric vehicles and plug-in hybrid vehicles.[10]

Similar to the United States, the European Union has also targeted household electric appliances as a means to increase energy-efficiency and reduce GHG emissions.[11] Germany in particular has served as a model for incentivizing individual and household behavior change. German insurance companies offer reduced premiums to residential building owners who have made improvements to conserve energy.[12] The government offers low-interest loans to homeowners who modernize existing buildings, construct new energy-efficient buildings, or install solar generation systems.[13] An ordinance requires owners of multi-occupancy residential buildings to bill tenants for heat and hot water costs according to their usage; tenants are entitled to claim fifteen percent of their energy consumption costs from their landlord if they fail to follow this procedure.[14] This billing scheme effectively raises tenants' awareness of their energy consumption and encourages them to conserve. Germany has also implemented an ecological fuel tax that has successfully reduced carbon dioxide emissions from the transportation sector.[15]

Another way to reduce household energy consumption is to encourage residents to participate in renewable energy delivery systems, such as community solar projects and energy service companies ("ESCOs"). ESCOs generate renewable energy and sell the electricity to a utility for distribution to regional or national subscribers, while community solar projects may limit participation to local residents. Community solar projects make renewable energy accessible to residents in multi-occupancy buildings, making them ideal for urban communities or rural residences that lack adequate sunlight. Customers can pay to support a local solar project and receive

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10. *Electric Vehicles: Tax Credits and Other Incentives*, DOE OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/electricvehicles/electric-vehicles-tax-credits-and-other-incentives [https://perma.cc/3G62-D2BY] (last visited May 16, 2018).

11. Thomas Daniel Wuertenberger, *The Regulation of CO2 Emissions Caused by Private Households—An Analysis of the Legal Situation in the European Union and Germany*, 16 MO. ENVTL. L. & POL'Y REV. 1, 10–11 (2009).

12. *Id.* at 18.

13. *Id.* at 23–25.

14. *Id.* at 21.

15. *Id.* at 52.

a credit on their electricity bill depending on the amount paid and energy generated.[16] This model has flourished in Minnesota, due in part to favorable government policies. The state's 2013 Solar Energy Legislation requires investor-owned utilities to source 1.5% of their electricity from solar by 2020, and at least 10% of this energy must be generated by facilities with a maximum capacity of 20 kilowatts.[17] Further, at least 20% of electricity sales must be generated by renewable energy sources by 2020, and at least 25% by 2025.[18] Since that law passed, Minnesota's solar market has grown nearly twenty times larger, increasing support for power generated by grassroots solar projects.[19] Another factor in Minnesota's solar success is that the state does not cap community solar output,[20] and the state's program reached a record 300 megawatts of operational capacity in March, 2018.[21] Electricity generated in excess of the needs of community solar participants may be sold to the grid.[22]

In addition, residents of states with deregulated energy markets can subscribe to an ESCO that delivers energy from renewable sources. Thus, a subscriber in New York City may receive wind energy from Nebraska or solar energy from Arizona delivered via an ESCO. State governments could encourage residents to subscribe to a renewable energy ESCO or community solar project by providing a tax credit or rebate for each year of participation. The government could also subsidize renewable energy ESCOs to ensure that residents' electricity bills won't exceed the amount spent under a non-renewable energy provider, if there is a price difference.

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16. GLOBAL CLIMATE CHANGE AND U.S. LAW 386 (Michael B. Gerrard & Jody Freeman eds., 2d ed. 2014).

17. Bob Eleff, *2013 Solar Energy Legislation in Minnesota*, MINN. HOUSE RESEARCH DEP'T (August 2013), http://www.house.leg.state.mn.us/hrd/pubs/ss/sssolarleg.pdf.

18. *Id.*

19. John Farrell, *Minnesota has the best community solar program—here's why*, MINNPOST (Aug. 21, 2017), https://www.minnpost.com/community-voices/2017/08/minnesota-has-best-community-solar-program-heres-why [https://perma.cc/62LW-WLZR].

20. *Id.*

21. John Farrell, *Why Minnesota's Community Solar Program is the Best*, INSTITUTE FOR LOCAL SELF-RELIANCE (Apr. 23, 2018), https://ilsr.org/minnesotas-community-solar-program [https://perma.cc/32D4-7BWL].

22. Eleff, *supra* note 17.

One concern with this proposal is that local governments may not be willing to provide such incentives if the renewable energy is not generated in their own state. Because ESCOs source energy from across the country, participants are often contributing to national, not local, GHG emissions reduction. However, states would be rewarded for incentivizing their residents to enroll in ESCOs regardless of where the emissions are reduced. Nevertheless, states may have ideological objections to participating in renewable energy schemes; states in which fossil fuel production comprises a large sector of the local economy may resist renewable energy initiatives on principle. In addition, customers in some states have been the victims of unscrupulous ESCO practices.[23] For example, in New York, a service company made false promises of lower prices to lure customers, enrolled people without their consent, and made it difficult for them to unsubscribe. Negative publicity about unscrupulous ESCOs could be a deterrent. State governments should monitor and vet ESCOs serving their residents to ensure that they do not put them at risk for exploitation.

2. Waste Diversion

Another category of government incentives aims to divert waste from landfills. Landfills are the third largest source of methane emissions in the United States,[24] and methane is a more potent GHG than carbon dioxide.[25] A primary component of methane in landfills is organic waste, which can be diverted through composting. Pay-as-you-throw ("PAYT") systems have been successful in some European countries and American municipalities in reducing the total amount of waste sent to landfill.[26] Participating governments charge residents for

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23. *AG Schneiderman To Distribute More Than $1 Million In Restitution To Nys Energy Customers Promised Lower Rates*, N.Y. OFFICE OF THE ATTORNEY GENERAL (July 7, 2015), https://ag.ny.gov/press-release/ag-schneiderman-distribute-more-1-million-restitution-nys-energy-customers-promised [https://perma.cc/YD59-44CR].

24. *U.S. Food Waste Challenge FAQ's*, USDA, https://www.usda.gov/oce/foodwaste/faqs.htm [https://perma.cc/43FP-KRAX] (last visited May 16, 2018).

25. *Understanding Global Warming Potentials*, EPA, https://www.epa.gov/ghgemissions/understanding-global-warming-potentials [https://perma.cc/K6NQ-84L4] (last visited May 16, 2018).

26. *Pay-As-You-Throw/Save-Money-And-Reduce-Trash PAYT/SMART Fast Facts*, MASSDEP (Nov. 2016), https://www.mass.gov/files/documents/2016/11/oh/

garbage collection services according to the amount of trash they produce, measured either by weight or number of garbage bags. This system prompts residents to recycle and compost to reduce their garbage collection fees. In 2015, a study of PAYT programs in Massachusetts revealed that municipalities that implemented such incentives produced only sixty-four percent of the landfill waste generated in non-participating municipalities.[27] Likewise, all European countries with recycling rates over forty-five percent had implemented a PAYT or similar system, while most countries with recycling rates below twenty percent had not.[28] The EU Landfill Directive of 1999 restricted the quantity of waste EU member countries could send to landfills, and the subsequent landfill tax further prompted countries to implement recycling and composting incentives.[29]

In the United States, the Resource Conservation and Recovery Act (RCRA) delegates most non-hazardous waste management to the states within the bounds of minimum federal requirements,[30] and many

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paytfast.pdf; *Municipal waste management across European countries*, EUROPEAN ENVTL. AGENCY (May 23, 2017), https://www.eea.europa.eu/themes/waste/municipal-waste/municipal-waste-management-across-european-countries [https://perma.cc/E57P-VTRX].

27. *Pay-As-You-Throw/Save-Money-And-Reduce-Trash PAYT/SMART Fast Facts*, MASSDEP (Nov. 2016), https://www.mass.gov/files/documents/2016/11/oh/paytfast.pdf.

28. *Municipal waste management across European countries*, EUROPEAN ENVTL. AGENCY (May 23, 2017), https://www.eea.europa.eu/themes/waste/municipal-waste/municipal-waste-management-across-european-countries [https://perma.cc/8LFV-HW2U].

29. Adam Vaughan, *What has the EU ever done for my . . . compost?*, THE GUARDIAN (June 22, 2016, 2:00 AM), https://www.theguardian.com/environment/2016/jun/22/what-has-the-eu-ever-done-for-my-compost [https://perma.cc/2JD6-3WV3]; *Waste*, EUROPEAN COMM'N, http://ec.europa.eu/environment/waste/landfill index.htm [https://perma.cc/SHL8-7PFV] (last visited May 16, 2018); LONDON ASSEMBLY, *Carrots and Sticks: A review of waste financial reward and compulsory recycling schemes* 14 (2011), https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/Waste%20financial%20incentives%20FINAL2.pdf.

30. *Resource Conservation and Recovery Act (RCRA) Overview*, EPA, https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview [https://perma.cc/NP6Y-F7BE] (last visited May 16, 2018); Robert V. Percival et al., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 122 (Wolters Kluwer Law & Business 7th ed. 2013).

states promote or require recycling of various materials.[31] More than half of the states have adopted e-waste recycling policies, at least ten have container redemption programs, and many have laws that impose a penalty for recycling solid waste improperly.[32] In addition, a program called Recyclebank partners with municipalities and brands to reward individuals and households for recycling,[33] among other sustainable behaviors. Individuals in participating municipalities receive points each time their recyclables are collected, and points are allocated based on the weight of the recyclables.[34] Points can be redeemed for a variety of prizes. Recyclebank operates in at least twenty-nine states across the United States and began partnering with communities in the United Kingdom in 2009.[35] In both the United States and United Kingdom, this incentive program has effectively shifted behaviors to induce higher rates of recycling.[36]

There are some potential drawbacks to waste diversion incentive schemes. One concern is illegal diversion; residents may burn or dump trash illegally to reduce their garbage collection costs in a PAYT system.[37] However, this has not been a significant problem in practice, and municipalities can deter such behavior by implementing strong enforcement policies.[38] The Recyclebank model presents an opportunity for perverse incentives: residents may deliberately produce more waste in order to accumulate more points. According to a 2011 report by the London Assembly Environment Committee, Recyclebank has procedures in place to avoid this outcome.[39] Finally, waste diversion models like PAYT and Recyclebank are more effectively applied to single-occupancy residences than large apartment buildings.[40] These systems could face challenges in dense urban communities where multi-occupancy buildings comprise a large

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31. Alexander et al., *supra* note 8, at 10–11.

32. *Id.* at 11–12.

33. RECYCLEBANK, https://www.recyclebank.com/about-us/ [https://perma.cc/L6GB-2U7Z] (last visited May 16, 2018).

34. LONDON ASSEMBLY, *supra* note 29, at 17.

35. *Id.*

36. *Id.* at 18.

37. *Illegal Diversion*, EPA, https://archive.epa.gov/wastes/conserve/tools/payt/web/html/top8.html [https://perma.cc/3Y3N-4PG3] (last visited May 16, 2017).

38. *Id.*

39. LONDON ASSEMBLY, *supra* note 29, at 25.

40. *Id.* at 27–29.

portion of the housing stock. In London, this approach failed due to high costs of implementation, logistical barriers, and low participation.[41]

New York, San Francisco, Seattle, and Portland are among the American cities that have implemented curbside compost collection,[42] while others provide a rebate on home composting equipment.[43] However, unlike recycling, there are few incentive programs in place to reward individuals who compost. A save-as-you-throw ("SAYT") model for composting could achieve this by giving individuals a financial incentive based on the weight of compost they put out for curbside collection—the reverse of charging residents per unit of landfill waste generated in a PAYT regime. In places where compost is collected at centralized drop-off stations, individuals could receive a financial incentive based on the amount of compost they deliver. For example, at New York City's Greenmarket compost collection sites, individuals could receive a two-dollar voucher called a "Greenmarket Buck," redeemable for products at any Greenmarket, in exchange for dropping off their compost.[44] Vouchers could be allocated based on the weight of the compost delivered. Municipalities or states could invest in rewarding residents for composting if the cost of providing the financial incentives were outweighed by savings associated with reducing landfill waste. Municipalities seeking to use the stick rather than the carrot could penalize residents who don't separate their food scraps from other waste, similar to the common method of enforcing recycling policies.

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41. *Id.* at 28–29.

42. Evelyn Cheng, *Are you gonna eat that? The future of recycling*, CNBC (Dec. 23, 2014), https://www.cnbc.com/2014/12/22/composting-may-be-future-of-recycling-with-us-cities-leading-the-way.html [https://perma.cc/TTP4-RU47].

43. *Austin Resource Recovery*, AUSTINTEXAS.GOV, http://www.austintexas.gov/composting [https://perma.cc/GN8U-92Q9] (last visited May 16, 2018); *Environmental Services*, CITY OF SAN DIEGO, https://www.sandiego.gov/environmental-services/recycling/residential/compostbinvoucher [https://perma.cc/HNP4-HD6K] (last visited May 16, 2018); *Compost Bin Coupon for Ventura Residents!*, CITY OF VENTURA (Oct. 5, 2011), http://sustainableventura.tv/2011/10/05/compost-bin-coupon-for-ventura-residents/ [https://perma.cc/Z8HS-39TT].

44. *Greenmarket Bucks*, GROWNYC, https://www.grownyc.org/greenmarket/bucks [https://perma.cc/FBQ5-MVLK] (last visited May 16, 2018).

3. Transportation

Local governments can directly incentivize consumers to travel by bicycle or alternative fuel vehicle. For example, New York City has partnered with Citibank to provide fleets of bicycles throughout the city which can be rented by the hour and returned to any Citi Bike station.[45] Offering attractive prices for bike share programs may encourage more residents to bike than to travel by car or even public transit. Municipalities can also reward owners of hybrid or low-emission vehicles by providing free parking on public streets. Salt Lake City offers two hours of meter-free parking for vehicles that meet certain EPA fuel economy and air pollution standards.[46] These transportation incentives are best-suited to urban environments; biking may not be a feasible mode of transit in rural areas, and metered parking is rare outside cities.

4. Indirect Initiatives

In addition to directly incentivizing behavior change, local governments can reward employers that implement programming to incentivize individuals to go green. This 'meta-incentive' rewards both the employer and the employees for sustainability both in and outside the workplace.

Some employers have already implemented such incentives. For example, the League of American Bicyclists has recognized Target, Facebook, LinkedIn, and other companies for their robust alternative transportation programs.[47] Resources available to employees include free onsite bike repairs, regular riding and maintenance classes, guided commute rides, and access to a corporate bicycle fleet.[48] These incentives eliminate costs and concerns associated with biking, but employers could go further by rewarding employees who use alternative transportation. Organizations can offer health insurance premium discounts, cash, gift cards, or other financial incentives to

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45. CITI BIKE, https://www.citibikenyc.com/how-it-works [https://perma.cc/U266-5R29] (last visited May 16, 2018).

46. Gerrard & Freeman, *supra* note 16, at 383.

47. Liz Murphy, *Business Innovators Invest in Bicycling*, THE LEAGUE OF AMERICAN BICYCLISTS (Apr. 22, 2014), http://bikeleague.org/content/business-innovators-invest-bicycling [https://perma.cc/KC8E-AMTT].

48. *Id.*

employees who bike, walk, or take public transit to work. Some workplace wellness programs have used these tools to encourage healthier behaviors.[49] Local governments could reward employers for adopting such incentives by giving them a tax credit or other financial incentive each year the program is in place. Currently, employers only receive recognition from volunteer or non-profit organizations when they invest in sustainability programs. Smaller organizations with fewer resources may not be able to offer such programs. A financial incentive could encourage more employers to participate and offset the costs of doing so.

Similarly, government incentives could be used to reward employers for implementing recycling and composting programs. The cumulative impact of reducing waste from individual employees in an office building is significant. Many individuals consume more food and generate more waste at work than they do at home. Thus, incentivizing waste diversion from households alone is insufficient, and employers are uniquely positioned to shape sustainability policies that impact their entire workforce. Employers that participate in recycling or composting programs could submit proof of participation to receive a tax credit or other financial incentive from the government on an annual basis. Examples of such proof could include a receipt from a recycling/compost collection service or official company policy with records of employees who manage composting activities.

SECTION II: ENCOURAGING STATE PARTICIPATION IN FEDERAL CLIMATE CHANGE EFFORTS

A. Carrots and Sticks: Approaches to Shaping State Behavior

Federal lawmakers and agencies must respect states' sovereignty, not only as a constitutional matter, but because effective laws must take into account local differences in geography and demography. At the same time, local policies must be woven into an overarching framework in order to yield a measurable, nationwide impact. This is particularly true in the environmental context. The urgency of climate change demands a national response, but cities and states should have

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49. *Employer health incentives*, HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH (Winter 2009), https://www.hsph.harvard.edu/news/magazine/winter09 healthincentives/ [https://perma.cc/8QBC-8CQP].

the freedom to adopt policies best suited to their unique populations. The Clean Air Act honored the importance of states' independence in crafting their own methods to meet federal air pollution standards. In addition, *South Dakota v. Dole*, 483 U.S. 203 (1987), highlighted the tension between state sovereignty and legitimate federal interests in incentivizing local policymaking. This section will discuss approaches to cooperative federalism and its potential implications for proposed climate change legislation.

In attempting to federalize environmental laws, Congress has used three general approaches.[50] The first is to provide federal financial assistance to encourage states to adopt environmental standards. The effectiveness of this approach depends primarily on the size of the "carrot," which in turn depends on the availability of federal funds. This method has been successful in areas where states resist federal regulation, such as land use and solid waste management. The second approach is cooperative federalism, in which federal agencies establish national environmental standards and states implement them locally.[51] While states may be delegated authority to administer local programs to meet federal requirements, they are not required to do so. The federal government enforces the national standards within states that choose not to administer their own programs. The Clean Air Act, Clean Water Act, RCRA, and the Safe Drinking Water Act are examples of the cooperative federalism model. The third approach favors federal control.[52] Regulations such as the Toxic Substances Control Act rely on the principle of federal preemption to implement uniform national regulation without delegating any administrative authority to states. This paper will focus on the second approach in prompting states to adopt policies that reach individuals at the grassroots level.

The Clean Air Act provides a useful model of cooperative federalism that can help integrate local and federal efforts to address climate change. The EPA sets standards to protect public health and the environment from adverse effects of air pollution.[53] States then submit their own implementation plans to achieve these standards.[54] If a state does not submit an approvable implementation plan, EPA can

50. Percival et al., *supra* note 30.
51. *Id.*
52. Percival et al., *supra* note 30, at 123.
53. 42 U.S.C.S. § 7409(b) (1977).
54. 42 U.S.C.S. § 7410 (1990).

require revisions and ultimately issue a federal implementation plan. In this way, states are given flexibility to design their own plans within the bounds of federal standards.

In addition, the Supreme Court has held that monetary incentives are constitutional exercises of Congressional authority under the Commerce, Tax, and Spending Clauses. Such incentives are permissible if they are in the pursuit of the general welfare, are not coercive or ambiguous, and demonstrate a connection between the funds being conditioned and the federal interest in question.[55]

B. Cooperative Federalism and Climate Change

The Clean Air Act and Supreme Court precedent can guide national legislation to incentivize state action on climate change by promoting programs such as those discussed in Section I. The federal government could set a national goal for GHG emissions reduction programs, similar to the Clean Air Act's National Ambient Air Quality Standards (NAAQS)[56] for existing sources, and calculate a proportionate contribution for each state based on current emissions levels and population. Under the Clean Air Act, states devise regulations to meet the NAAQS through state implementation plans ("SIPs").[57] If states do not submit an approvable SIP, the EPA administers a federal implementation plan (FIP)[58] to ensure the national standards are met. In 2009, the EPA issued an endangerment finding for GHGs, including carbon dioxide, following the Supreme Court's ruling that the Clean Air Act definition of "air pollutant" was broad enough to encompass GHGs.[59] This allowed the EPA to regulate carbon dioxide and other GHGs to protect public health and the environment. Thus, the concept of regulating GHG emissions is not new.

Similar to the structure of the Clean Air Act, states could determine how to achieve compliance with the federal mandate. SIPs would rely

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55. South Dakota v. Dole, 483 U.S. 203, 207-08 (1987); New York v. United States, 505 U.S. 144, 171-72 (1992).

56. 42 U.S.C.S. § 7408 (1998); 42 U.S.C.S. § 7409(b) (1977); Percival et al., *supra* note 30, at 527.

57. 42 U.S.C.S. § 7410 (1990); *SIP Requirements in the Clean Air Act*, EPA, https://www.epa.gov/air-quality-implementation-plans/sip-requirements-clean-air-act [https://perma.cc/Y7TF-GWQH] (last visited May 16, 2018).

58. *Id.*

59. Massachusetts v. EPA, 549 U.S. 497, 532 (2007).

on local programming that helps individuals reduce their GHG emissions in the workplace and at home, such as the incentives discussed in Section I. In the energy sector, states could promote the growth of community solar projects, incentivize individuals to use alternative energy at home, and reward those who retrofit their homes or install energy-efficient appliances. In the waste sector, they could introduce pay-as-you-throw garbage collection policies, mandate composting and recycling, introduce free curbside compost pickup, or offer incentives to those who compost voluntarily. In the transportation sector, they could reward employers that provide alternative transportation resources and incentives to employees, as well as individuals who purchase electric or hybrid vehicles. While some cities, towns, and states have already implemented such incentives, this has largely taken place on a voluntary basis, and there is no comprehensive incentive system to reward or punish local governments based on their participation.

Following the example of the Clean Air Act, state implementation plans could be composed of a basket of incentives best suited to local characteristics. Best practices have demonstrated that PAYT systems of waste collection are more effective in places with single-occupancy homes than in large apartment complexes.[60] On the other hand, the German ordinance that bills tenants directly for their energy use would be most applicable in multi-unit residential buildings. Rewards for biking or using public transit are more logical in urban rather than rural places. Residents of single-occupancy homes would be best situated to take advantage of tax incentives for retrofitting their homes with energy-efficient appliances. The Recyclebank program, like other waste management practices, should be adopted at the municipal level. Thus, a one-size-fits-all incentive policy would not account for differences between and within states. The federal government could set standards for the plans, such as a minimum number of incentives that must be implemented within specific sectors. States could work with local governments to ensure that they have implemented incentives in the energy, waste, and transportation sectors without telling them which specific programs to adopt. Local governments could submit reports on their emissions reduction activities to the state, which could compile them for submission to the federal government.

60. LONDON ASSEMBLY, *supra* note 29, at 10–11.

States could also choose to coordinate some programs through state agencies to ensure uniformity across all municipalities, such as workplace sustainability incentives.

Some incentives are best implemented at the federal level. For example, it may be more efficient to coordinate tax incentives for electric or hybrid vehicles or energy-efficient appliances through the U.S. Department of Energy. This would ensure consistent nation-wide incentives and a streamlined submission process managed by a federal agency. However, states and municipalities should be encouraged to adopt additional incentives that further reduce emissions at the local level.

States that do not submit a plan for approval to the federal government or that do not attain compliance with the federal standards could be subject to reduced funding from the U.S. Department of Transportation, the Federal Highway Administration, the U.S. Department of Agriculture, or the U.S. Department of Energy. This scheme would likely not violate the federal spending power. First, reducing GHG emissions in order to abate climate change serves a public purpose. Climate change threatens public health and the future of our planet, and is exacerbated by continued GHG emissions. Thus, reducing GHG emissions serves a public interest. Second, legislators would need to choose a percentage of federal funds that would not be unduly coercive if withheld from states, in order to allow them to "exercise their choice knowingly, cognizant of the consequences of their participation."[61] Third, there is a reasonable relationship between the nature of the federal funds being withheld and the public interest being served. Funds from federal agencies that deal with transportation, federal highways, agriculture, and energy are used by states to implement local programming related to those subjects. It is reasonable for federal agencies to withhold a portion of this funding to encourage states to align their climate change policies with federal priorities in pursuit of the general welfare. Under the Clean Air Act, states that do not remedy deficient state implementation plans within a certain period of time are subject to restricted federal highway funds

61. South Dakota v. Dole, 483 U.S. 203, 207 (1987).

for projects in nonattainment areas.[62] This can serve as a model for conditioning federal funds on state alignment with federal standards.

SECTION III: ANTICIPATED BARRIERS TO SUCCESSFUL IMPLEMENTATION

A. Challenges

The first challenge is both political and ideological. Given the current administration and right-leaning Congress, it is unlikely any climate change legislation will be passed during the current term of office. Furthermore, American culture places a high value on individual freedom. A law that seeks to change individual behaviors would likely be very unpopular. Even though many Americans support policies that address climate change,[63] they often resist laws that infringe their personal liberties. No major environmental laws have been passed in decades, and legislative action on climate change is politically fraught. If a climate change bill were proposed, it would be more likely to target emissions from companies, organizations, and local governments rather than individuals.

The second challenge is administrative. Federal, state, and local agencies expend resources in responding to climate change, and these expenses will continue to increase if we do not drastically reduce our GHG emissions. However, a thorough cost-benefit analysis would be necessary for climate change legislation that could have significant costs as well. A law that requires coordination between federal, state, and local governments, as well as non-government entities and individuals, will entail monitoring, reporting, and other administrative costs. Adequate monitoring is necessary to ensure tax credits or other financial rewards are not distributed inappropriately. Ineffective monitoring and inaccurate reporting could lead to lost tax revenue without the intended environmental benefits. Administrative costs could be high, and it is not clear whether they would exceed the money

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62. *The Clean Air Act in a Nutshell: How it Works*, EPA (Mar. 22, 2013), https://www.epa.gov/sites/production/files/2015-05/documents/caa_nutshell.pdf.

63. *Yale Climate Opinion Maps—U.S. 2016*, YALE PROGRAM ON CLIMATE CHANGE COMMUNICATION, http://climatecommunication.yale.edu/visualizations-data/ycom-us-2016/?est=happening&type=value&geo=county [https://perma.cc/6ZWP-LD32] (last visited May 16, 2018).

saved by reducing public health and environmental harms. This legislation would also require federal and state agencies to contribute resources to implementing incentives at the local level. For example, financial rewards used to promote municipal composting and the use of bikes or public transit must be funded or subsidized by the federal or state government to make participation feasible. The need for financial support to implement incentive programs across the country could require significant resources, and it is not clear how federal or state budgets would accommodate this need. This problem could be compounded by the fact that the financial incentives in question would diminish overall tax revenue that could be spent on environmental and public health programs.

B. Program Implementation

There are various logistical challenges associated with implementing the proposed legislation. There could be a disparity between the emissions reduction standards set by the federal government and the results of programs implemented at the local level. Even if a state successfully implements many local incentives in each of the required sectors, it may not achieve a prescribed level of emissions reduction. Therefore, federal goals should focus on the number and types of programs implemented within each state rather than a specific quantity of emissions reduction. This should be proportionate to the state's population. A state like Montana, which has a little over one million residents, should not be required to implement the same number of programs or achieve the same level of emissions reduction as New York, which has a population of nearly twenty million.[64] Just as incentives must be tailored to characteristics of local communities, federally-imposed standards should account for differences between states.

Measuring and policing compliance is a challenge inherent in the existing structure of the Clean Air Act. Since states are delegated authority to administer national standards, they are responsible for tracking and reporting compliance with SIPs. In reality, state monitoring under the Clean Air Act is often imperfect, or even

64. *QuickFacts*, U.S. CENSUS BUREAU, https://www.census.gov/quickfacts/fact/table/NY,MT/PST045217,PST045216 [https://perma.cc/GE2K-BM4M] (last visited May 16, 2018).

inadequate. In the context of the proposed legislation, states would be expected to adopt a minimum number of programs across specific sectors, not enforce a specific numerical standard. Therefore, participation is compliance, and states are rewarded for participating via a basket of federal incentives. The federal government may implement federally-operated programs in states that choose not to administer their own programs, as in the Clean Air Act. This structure eliminates the need for complex monitoring and policing. It is much simpler to determine whether states have designed and implemented a local program than to measure adherence to air quality standards. Because an analysis of costs, benefits, and environmental impact should be conducted for each incentive program prior to adoption, it will not be necessary to measure specific emissions reductions in each state after implementation.

Additionally, states may not reap the benefits of programs that do not reduce emissions locally. This is another reason why it is important for state compliance to be measured by program implementation rather than numerical benchmarks. States should be rewarded for incentivizing residents to subscribe to renewable energy ESCOs even if the energy source is in a different state. An incentive system based purely on reductions within a state's borders ignores the national and sometimes global effect of shifting energy demand. Likewise, composting food scraps could reduce GHG emissions from the vehicles needed to transport waste to landfills in other states, as well as from the landfills themselves. A state that adopts policies that have positive impacts in other states should be rewarded as if the emissions took place in its own state.

In the same vein, it would be unfair to allow a state that implemented few sustainability measures to reap the benefits of emissions reduction measures implemented by other states. For example, if Ohio residents receive their energy from solar farms in Arizona, Ohio should be rewarded for the emissions reductions even though the energy wasn't generated there. This analysis becomes complicated if the same solar farm serves customers in multiple states, making it difficult to track which emissions reductions are attributable to which states. One way to address this problem is to calculate the annual GHG emissions from an individual that sources his or her energy from fossil fuels. If that individual transitions to renewable energy generated in a different state, the amount of emissions saved may be attributed to that

individual's state, even if individuals in other states use the same source. This shifts the focus to emissions reduced by the individual rather than the source, allowing residents of Ohio to get "credit" for their emissions reductions even if the impact is felt in Arizona.

Furthermore, it may be difficult to calculate the net benefits of proposed initiatives. For example, composting can reduce methane emissions from landfills, but compost piles also produce methane during decomposition. While composting saves space in landfills and has some carbon storage properties, it could come with unintended consequences. If the same trucks previously transported food waste and other garbage to the landfill together, separating organics for composting might require more trucks to take separated waste to different destinations, consuming gasoline and emitting GHGs in the process. Thus, a reduction of emissions in one realm may cause an increase in another. It is important to consider the indirect effects of such practices to ensure that government funds are not spent on programs that provide little net reduction in GHG emissions. In addition, initiatives like composting may have benefits unassociated with reducing GHG emissions. A growing national population, particularly in dense, northeastern localities, raises land use concerns that will become increasingly relevant as existing landfills reach maximum capacity. Urban waste management could become more difficult as the distance between residents and the nearest landfills increase.

An additional challenge is that some states may opt to give up a small portion of federal funds rather than invest resources in designing and implementing incentive programs. Since the amount of federal funds withheld cannot be large enough to be coercive, states retain the choice of whether or not to participate. The Clean Air Act addressed this problem by issuing a federal implementation plan for states that failed to submit an approvable plan of their own. The federal government could take a similar approach here, although this would frustrate the goal of tailoring incentive programs to local characteristics. The federal implementation plan could include incentives that cut across geographic and demographic differences, such as tax credits or rebates for energy-efficient appliances and electric or hybrid vehicles. Since waste management and transportation alternatives are typically coordinated at the local level,

it would not be feasible to include such programming in a federal implementation plan.

Finally, there is the possibility that incentive programs will fail to change behavior enough to meaningfully reduce GHG emissions. Even if a state successfully coordinates local incentives, there are barriers to widespread participation. First, extensive outreach will be necessary to educate the public on the available incentives. Because the proposed legislation aims to streamline various programs, a coordinated publicity effort could raise awareness of existing incentives in addition to new ones. It is harder to educate the general public about environmental laws than regulated entities, and this may be one reason why past legislation has focused on industrial rather than individual GHG emissions. Vandenbergh et al. have described design principles to assess energy efficiency programs for the household sector, including selecting high-impact actions, providing sufficient financial incentives, effective marketing, intervening at the point of decision-making, simplicity, and quality-assurance.[65] These principles could be applied to assess and improve the effectiveness of incentives under the proposed legislation.

In addition, financial incentives do not guarantee behavior change. If a person is not interested in composting or biking to work, there may be no financial incentive sufficient to shift their behavior, particularly if they have a comfortable lifestyle. In addition, consumers purchase cars and major household appliances infrequently. A person may be unwilling to invest in a new car or appliance if their existing one is functional, despite the financial incentives to do so. To address the problems of complacency and apathy, financial incentives must be meaningful enough for individuals to resist the strong pull of the status quo. In order for states to be willing to invest the necessary resources to offer compelling incentives, a cost-benefit analysis must demonstrate the long-term benefits of reducing GHG emissions and reduced state spending on resiliency and recovery, emergency response, health, and other costs associated with climate change.

Despite these challenges, there is cause for optimism about the potential of behavior-shifting legislation. Recycling programs across

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65. Michael P. Vandenbergh et al., *Implementing the Behavioral Wedge: Designing and Adopting Effective Carbon Emissions Reduction Programs*, 40 ENVTL. L. REP. 10547, 10554 (2010).

the country have successfully changed the way individuals view and dispose of certain types of waste. The results may not have been immediate, but today recycling is a social norm in the cities and states that have adopted such legislation.[66] On the other hand, some argue that reducing waste by recycling and composting is expensive and does not yield worthwhile environmental benefits.[67] This paper has outlined a legislative framework to incorporate existing and potential incentives that shift individual behaviors, but it has not evaluated the costs and benefits of particular programs. A quantitative analysis would be needed to ensure that the costs of selected incentive programs would not exceed the environmental benefits in order for such legislation to be feasible. Given the resources required to implement effective incentive programs, incentives should be selected based on their potential to maximize reductions of GHG emissions.

Climate change is a problem that grows more urgent as time passes. Targeting emissions from the largest polluters is inadequate to achieve national GHG emissions reductions that will ensure a safe future on this planet for current and future generations. A coordinated effort between federal, state, and local governments is necessary to harness the power of individual actions within a comprehensive regulatory framework. Cooperative federalism, as implemented in the Clean Air Act, can provide a useful model in crafting these policies.

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66. *Mandatory Plastic Recycling Legislation*, THE ASSOCIATION OF PLASTIC RECYCLERS, https://plasticsrecycling.org/resources/state-recycling/mandatory-plastic-recycling-legislation [https://perma.cc/V6K9-PYQD] (last visited May 16, 2018).

67. John Tierney, *The Reign of Recycling*, N.Y. TIMES: OPINION (Oct. 3, 2015), https://www.nytimes.com/2015/10/04/opinion/sunday/the-reign-of-recycling.html [https://perma.cc/D2PF-JTMV].