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Will the Developing World's Growing Middle Class Support Low-Carbon Policies?

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Abstract

As billions of people in the developing world seek to increase their living standards, their aspirations pose a challenge to global efforts to cut greenhouse gas emissions. The emerging middle class is buying and operating energy intensive durables ranging from vehicles to air conditioners to computers. Owners of these durables represent an interest group with a stake in opposing carbon pricing. The political economy of encouraging middle class support for carbon pricing hinges on offsetting its perceived negative income effects. Rising environmentalism in the developing world could also increase support for credible greenhouse gas reduction policy. This paper quantifies these effects by estimating Engel curves of durables ownership, comparing the grid's carbon intensity by nation, and studying the demographic correlates of support for prioritizing environmental protection.

This paper is a product of the Equitable Growth, Finance and Institutions Practice Group. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://www.worldbank.org/prwp. The authors may be contacted at kahnme@usc.edu and slall1@worldbank.org.

Will the Developing World's Growing Middle Class Support Low-Carbon Policies?

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Summary for Policy Makers

Rising middle-class incomes in low- and middle-income countries (LMICs) will lead to a surge in demand for consumer durables, leading to rapid increases in the demand for electricity and energy. Consumer durables, electricity, and energy are important for human welfare and a successful development strategy would include growing abundance of all such durables.

Considering the high carbon intensity of existing energy systems in these countries, rising energy demand is likely to be accompanied by large increases in CO2 emissions, creating a dilemma for policy makers. Economists would recommend carbon pricing as an effective response, but this can lead to large increases in energy prices for an extended period. Careful design of carbon taxes and recycling of tax revenues back to the public could alleviate losses by energy consumers. Nevertheless, governments in LMICs remain wary of large-scale carbon pricing schemes, given the potential for political opposition from the growing and politically influential middle class.

One possible way out of the dilemma is evidence that as incomes and education increase, people also become more supportive of environmental protection, and more willing to trade private consumption for a cleaner environment. However, even in high-income countries, there appears to be limited support for carbon pricing schemes. In environmentally conscious Europe, there are many subnational regions featuring high carbon average footprints, where the middle class elected officials are likely to oppose carbon pricing, pockets of “green resistance”.

While carbon pricing has strong economic credentials, there appear to be significant political-economy obstacles to its adoption at the speed and scale needed to tackle the problem of climate risk. This suggests the need for policy makers to devote attention to complementary climate policies, including ones that work *with* rather than *against* the public's ingrained preference for abundant and cheap energy. International transfers and technology adoption that greens the local power grid will need to complement pricing instruments. The middle class in LMICs will support low carbon policies if they are compatible with their growing demand for consumer durables.

I. Introduction

In November 2021, representatives from nations from all over the world attended the COP 26 meetings in Scotland where negotiators sought a pathway forward to achieve a global carbon budget to limit global warming to 1.5 degrees Celsius. Analysts who have studied the necessary carbon emissions reductions for achieving this goal posit that only 11% of the carbon budget is still available (Dasgupta, Lall, and Wheeler 2022).

As observed at the COP 26 meetings, global cooperation to cap greenhouse gas (GHG) emissions faced pushback from many developing countries. A type of bargaining game is now playing out. Many academic economists have argued that there is a global Hicksian Pareto improvement possible if the developing world is compensated for not engaging in fossil fuel intensive economic development (see Kleinnijenhuis, Adrian and Bolton 2022).

Yet, efforts to reduce GHG emissions require incurring upfront costs in return for uncertain future benefits of less climate change risk. The emerging middle class in the developing nations could bear much of these costs as they are now buying and operating energy intensive durables ranging from vehicles to air conditioners to computers. Owners of these durables represent an interest group with a stake in opposing carbon pricing. In the absence of targeted transfers, such a Pigouvian policy would introduce a negative income effect. The French Yellow Vest protests of 2018 may offer a preview of the future in the developing world if the emerging middle class views the low carbon policy agenda to be elitist and to lower their standard of living by raising the prices of energy and limiting their personal freedom.

In this paper, we use several data sets to explore the consumption patterns, carbon emissions and environmental attitudes of people with different incomes and educational attainment levels. First, we use data from the World Bank's Living Standards Measurement Surveys to estimate durables Engel curves. We provide new evidence on the extensive margin of demand for a variety of carbon intensive durables – cars, motorcycles, air conditioners, refrigerators, computers, televisions, washing machines and cell phones. If a nation's electricity grid could be cheaply decarbonized then such consumers would not bear the incidence of a carbon tax. Owners of internal combustion engine motorcycles and vehicles would face the carbon tax burden as their asset's resale value would decline and its operating cost would increase.

Research that studies the climate change externality challenge posed by income growth posits that no single durables owner or buyer has an incentive to internalize the social costs caused by fossil fuel energy consumption. As documented by Davis and Gertler (2015) and Gertler et al. (2018), there is a rising demand for durable goods across the developing world. For the case of air conditioning, Davis and Gertler (2015) estimate ownership increases by 2.7 percentage points per $1,000 of annual household income. They use their estimates combined with income growth projections, data on utilization, and an estimate of the grid's future carbon intensity (i.e., tons of GHG emissions per MWh of power generation) to predict the impact of the world's growing middle class on future GHG emissions. Biardeau et al. (2020) document how cooling degree days in developing nations with extremely hot summers translates into increased electricity consumption as air conditioning ownership rates increase. Despite dramatic improvements in energy efficiency over time, economic growth in LDCs is not less energy-intensive than past growth in developed countries (van Benthem 2015).

We build on this past research by presenting new Engel curves estimates and we focus on what these Engel curves mean in terms of stakeholders in the status quo carbon intensive economy. We augment these data with national data on the emissions intensity of the grid to discuss how the social costs of operating these various durables differs across nations.

In developed nations, we present new evidence on the political economy challenge posed by durable internal combustion engine vehicles and by high-carbon cities within nations. Using data on California vehicle registrations, we document the slow progress in increasing the share of electric vehicle ownership. For each European nation, we document the variation in the cross-city carbon emissions per-person. The results from these data sets document that even in rich nations there are many people whose carbon footprint is large and thus they bear more of the economic incidence of carbon pricing (Glaeser and Kahn 2010).

The growth of the middle class in developing nations is fueled by urbanization and rising educational attainment. These secular changes raise the possibility of increased support for environmental protection over time. Richer people are willing to pay more than poorer people to avoid risk and climate change raises our risk exposure along many margins (Costa and Kahn 2004). U.S based research documents that the more educated are more patient and more likely to support environmental protection (Becker and Mulligan 1998, Kahn 2002). We explore the role of both income and individual education in determining one's stated support for environmental protection. Using data from the World Values Surveys, we find that more educated people state their support for prioritizing environmental protection over economic growth.

In the case of local pollutants such as PM2.5 or water pollutants, the reduced form cross-national carbon dioxide Environmental Kuznets Curve shifts down and inward over time (Dasgputa et al. 2002). One explanation for this empirical finding is that as nations grow richer, they internalize the social costs caused by local pollutants. This fact raises the possibility that as developing nations grow richer their own people may support a "greening" of coal fired power plants in order to enjoy local air pollution gains.

Our cross-national Engel curve estimates suggest that this optimism has not held in recent years for carbon dioxide emissions. The sheer scale of consumption increases in large lower-middle-income nations such as China and India means that these nations must make significant carbon intensity progress to offset the scale effects associated with increased consumption (Acemoglu et al. 2019). In richer nations, greenhouse gas emissions continue to rise but at a decreasing rate.

The rest of this paper is organized as follows. Section II sets up the trade-offs individual voters face in determining their support for low carbon policies. Section III describes the empirical work that estimates Engel curves, the adoption of electric vehicles in the United States, within-country variation in carbon emissions in Europe, and the correlates of support for environmental policies. Section IV concludes.

II. Understanding Voter Preferences over Introducing Carbon Taxes

A voter's support for carbon pricing will be based on comparing the costs of a short run increase in energy prices versus the ongoing benefits of facing less climate change risk and gains from improved local air pollution (Weitzman 2014, 2017). In the discussion below, we focus on cost heterogeneity. Those who are terrified by future fat tail risks associated with climate change will place a great benefit on enacting a carbon tax because of its insurance benefits (Wagner and Weitzman 2016).

If people have a smaller carbon footprint in their consumption and if their job is not threatened by carbon pricing then they are more likely to support low carbon policies (Cragg et al. 2013). Even in progressive Washington State, the introduction of a carbon tax has failed to be enacted (Anderson, Marinescu and Shor 2019).

Research investigating the political economy issues that arise in implementing carbon mitigation incentives has branched out into several subfields. Public finance economists have shown great creativity in exploring strategies for addressing distributional concerns. Metcalf (2007) proposes lowering the labor tax in return for raising the carbon tax. Public finance research has used computable general equilibrium models to simulate how different consumers across the income distribution would be affected by a carbon tax. Recent research has documented that European nation economic growth has not been slowed by carbon pricing (Metcalf and Stock 2020).

There is an emerging literature that documents that voters respond negatively to salient price increases (Douenne and Fabre 2022). Sallee (2021) emphasizes the lack of precision in targeting and compensating losers as a rational choice explanation for why Pigouvian policy reforms are difficult to implement. The details of recycling the revenue will matter here. If the revenue is given back per households such as in Canada, then the Coasian transfer will be smaller than if the government keeps the revenue to use for other purposes. A key issue here pertains to trust in the national government. In the developing world, will the national government recycle the tax revenue back to the people? If the middle class doubts this, then such time consistency concerns will reduce voter support for Hicksian Pareto improving policies (Acemoglu 2003).

Black and Heine (2019) highlight the challenges with program design. In October 2019, Ecuador tried to abruptly remove fuel subsidies to consolidate the government budget. Sufficient compensation was not offered, leading to protests by transportation unions, students and indigenous people, leading to reversal of the policy after two weeks.

Recent research has documented that misperceptions also play a role in explaining the carbon policy divide. Douenne and Fabre (2020) use a survey approach to study the support for a carbon tax and dividend policy based on a sample of French people. These authors find that the survey respondents reject a tax and dividend policy where the revenue is equally redistributed to adults. They claim that people incorrectly believe that the policy is regressive and do not believe that the policy will achieve its stated environmental goals.

A recurring theme from recent research on media economics is that social media and the news have a causal role in influencing people's perceptions of the fairness of a new policy (DellaVigna and La Ferrara 2015, Gentzkow and Shapiro 2008). Such misperceptions are more likely to play out in a setting where people do not have previous experience with the introduction of carbon taxes. Stavins (2022) echoes this point as he emphasizes the importance of building political acceptance for pricing instruments through influencing public perceptions.

The recent economics literature demonstrates why voters in developing nations are likely to be skeptical about the short run benefits to them of supporting carbon pricing. Higher fossil fuel prices reduce their short run material well-being and represent a loss of their implicit property right to access cheap fossil fuel fired energy sources. The reaction to the summer 2022 spikes in global gas prices highlight the adjustment challenge. Of course, this gas price spike was a surprise.

Voters in the developing world are even less likely to support the carbon policies than voters in richer nations because the former will bear a larger marginal cost, as a fraction of their total income, and they may value the benefits of reduced climate risk less as their value of a statistical life is likely to be lower (Costa and Kahn 2004). Transfers from the North to South could compensate here. The transfer that people will require is a decreasing function of their concern about climate change and increasing function of whether the carbon tax would raise their unemployment risk or lower their consumption opportunities by raising the cost of purchasing and operating durables. Lower income people are the most likely to be at the margin. If such individuals view the carbon tax to be elitist and threatening their material ambitions then they will be even more likely to oppose such a tax. They are likely to oppose these policies unless credible "cap and dividend" provisions are built into the policies.

III. Empirics

Our empirical work first reports estimates of durable goods Engel curves as we study the relationship between durables ownership shares and per-capita income. We then use country specific data to estimate the carbon dioxide implications of durables ownership and use. We report cross-national carbon dioxide Engel curves. We next present data from California and Europe to document that these wealthy areas feature significant numbers of consumers creating a large average carbon footprint. In our last piece of empirical work, we turn to micro survey data to estimate the association between education and support for environmental protection. Together, these various pieces of evidence allow us to provide a consistent explanation for the slow progress in negotiating sharp greenhouse gas emissions reductions.

Estimating Engel Curves

Table 1 lists the nations for which the World Bank has assembled data on household durables ownership. The table also reports the first year the survey data are available. Data on asset ownership come from the World Bank's Global Monitoring Database (GMD). The original source of the data are country-level household survey data that measure household income or consumption in each country. World Bank teams work closely with National Statistical Offices (NSOs) to ensure that household survey data are of good quality and that technical calculations are robust and aligned with international best practices. However, data on durables ownership are not collected in all national household surveys. Further, the World Bank does not have access to micro data from China's National Bureau of Statistics; thus, China does not appear in the data set. For each of these nation/year pairs we have five data points for each durable good. These five data points correspond to the quintiles of the income distribution in that nation/year. The World Bank data also provides a measure for each nation/year/income quintile of either the average daily personal consumption or average daily income measured in PPP $ 2011.

For 66% of the sample, we observe the income and for 33% we observe the consumption measure. This variable is the key explanatory variable in our regressions below. In results available on request, we have run our Engel curve estimates separately (so using log(consumption) for 33% of the sample and log(income) for the other 66% of the sample). The estimated income effects are quite similar so we pool our results below but the separate regressions are available on request.

Our econometric specification is presented in equation (1). The dependent variable is the share of households in income quintile i in nation j at time t that owns a specific durable.

$$Share_{ijt} = \alpha_{jt} + B_1 * \log(Income_{ijt}) + U_{ijt} \quad (1)$$

We include nation/year fixed effects in each regression and the regressions are population weighted. The data source for population is the World Development Indicators. In estimating equation (1), it is important to note that the within nation/year variation in durables ownership and the income at the specific quintiles allows us to estimate B_1. The nation/year fixed effects control for nation specific durables prices.

In Tables 2 and 3 we report our estimates and the lowest income category is the omitted category. Consider column (1) where we report the automobile ownership regression results. A doubling of personal real income increases the probability of owning a vehicle by .139*log(2) or 9.6 percentage points. This functional form embodies diminishing returns to scale and highlights that the growth in durables ownership is most affected by low-income nations growing richer. We find similar magnitude income effects for air conditioners and refrigerators, washing machines, cell phones, computers, and televisions.

The Environmental Implications of the Growth of Middle Class Consumption

Rising electricity consumption does not result in more greenhouse gas emissions if a nation's electricity grid is quite green. To measure each nation's grid we use data from 2014 from the World Development Indicators database. We take U.S. emissions factors for coal fired power plants, natural gas and oil fired power plants and weight these by nation specific shares to yield the national emissions factor. In Table 4, the electricity grid emissions factor is measured in 1,000 pounds of carbon dioxide per MWh. The formula for this variable is based on 2.21*share of power from coal + 0.91*share of power from natural gas + 2.13 * share of power from oil. While these emissions factors are based on U.S. data, there is little reason to believe that they sharply vary across the world. We use the carbon emissions factors for coal, natural gas and oil to create a single index of a given nation's grid carbon intensity. Table 4 shows that the largest nations in the world often feature a dirty grid and this means that the rising durables consumption will translate into higher carbon emissions than would take place if the grid was cleaner.

In Figure 1, we take the World Development Indicators database for the year 2018 and graph the log of carbon dioxide emissions per-capita with respect to the log of GDP per-capita. For the 181 nations, the income elasticity estimate is 1.26. The figure's dots are weighted by national population and India and China stand out for their contribution to emissions. In this cross-sectional figure, higher income nations have a less positively sloped elasticity than middle-income nations. In Figure 2 for 174 nations, we graph the percentage change in per-capita carbon dioxide emissions from the year 2000 to 2018 with respect to the log of national per-capita GDP in 2000. The slope is -.34 in this case. The poorer nations that are urbanizing and industrializing have a larger growth in carbon emissions than richer nations. Together, these two figures highlight the challenge that lower-middle-income nations pose for creating a low carbon emissions coalition. As these nations grow richer, their carbon emissions increase.

One possible offsetting force is the recognition of the co-benefits of reducing reliance on coal fired power. Barrows, Garg and Jha (2019) quantify the air pollution externality associated with coal burning in India. Cesur, Tekin and Ulker (2017, 2018) use data from Turkey to document the local air pollution gains as the nation increases its reliance on natural gas for generating power and closed coal fired power plants. In developing nations, the value of a statistical life increases as economic development takes place (Costa and Kahn 2004). This means that the Pigouvian damage to India from air pollution created by its own coal fired power plants increases as the nation grows richer and more people live in a vicinity of the power plants. At least up until this point, this local benefit of substituting away from coal has not been a sufficient incentive.

Electric Vehicles Adoption in California

In the developing world, people are purchasing durable products that increases their carbon footprint. In the United States, a promising trend is that more and more people are purchasing electric vehicles with wealthier people purchasing vehicles such as the Tesla. If the power grid is green, then this purchase decision can decouple consumption gains from greenhouse gas production.

The state of California provides unique zip code level data on vehicle registrations.[1] The data are available from October 2018 and January 2020. In each of these two cross-sections, the data report each zip code's count of vehicles by fuel type and by model year. In total, the data set includes over 30 million vehicles. We have merged year 2018 Internal Revenue Service zip code data on the household income of tax filers.[2] For roughly 1,900 zip codes in California, we merge in data to identify the 25% highest income zip codes in the state. The zip codes are sorted by the percentage of tax filers with incomes over $200,000. In Table 5, we report the empirical distribution of vehicle fuel types in 2018 and 2020 and we report these tabulations for rich and non-rich zip codes. The first key finding is that even in rich, educated and progressive California, the percentage of electric vehicles in the fleet is very low. The second fact is that the share of electric vehicles is growing over time. At each point in time, richer zip codes have a much larger share of electric vehicles.

The California vehicle registration data also reports the model year distribution of the vehicles by zip code. In the bottom of Table 5, we report the empirical distribution of vehicles by three categories; vehicles built before 2010; vehicles built between 2010 and 2015 and "new" vehicles. The key point that emerges here is the durability of the capital stock. The vehicle stock is old and predominantly gasoline based. Given that cars can live on for decades, even California stakeholders have an incentive to oppose higher gas taxes.

In this section, we have presented new evidence documenting the growth of EVs but the very small market share of this product even for rich people. We have also emphasized the durability of these products. The long lived nature of the capital stock slows down the adjustment process and creates vested interest groups with a stake in maintaining the status quo.

Within-Nation Carbon Geography: Evidence from Europe

[1] https://data.ca.gov/dataset/vehicle-fuel-type-count-by-zip-code

[2] https://www.irs.gov/statistics/soi-tax-stats-individual-income-tax-statistics-zip-code-data-soi

We have documented that in the developing world millions of people are purchasing energy intensive durables.   In the previous section, we documented that even California features a large durable set of fossil fueled vehicles.   In this section, we present additional evidence from Europe documenting that within each of the continent's nations there are geographic clusters of higher carbon footprint places. High emissions regions have incentives to lobby their local officials to protect them.

Previous research on the United States has documented how local carbon emissions influence carbon politics. Eyer and Kahn (2020) document efforts by coal states such as West Virginia to use local policies to protect coal miner jobs. Cragg et al. (2013) document that Congressional voting on enacting Cap and Trade legislation is associated with the area's local per-capita carbon footprint. Representatives are more likely to vote in favor of carbon pricing if their district's emissions are lower.

Within nations, there can also be geographic areas that oppose carbon pricing because the local economy is carbon intensive. A region can have a large carbon footprint because of the industries concentrated there, the area's low population density, and the types of power generation used to generate power.   To explore this point, we use data from jurisdictions within European nations. The raw data are from https://openhgmap.net/data.[3]

In Table 6, we report the average carbon footprint and the coefficient of variation across cities within the same nation in Europe. World carbon dioxide emissions per-capita in 2018 was 4.5 tons.[4] These results indicate that there are high emitting regions even in relatively low carbon nations such as France and Germany. Poland features a high coefficient of variation indicating that there are high carbon areas. The people and the political leaders of these regions will be less likely to support the low carbon agenda and they are likely to argue that Pigouvian policies are elitist unless there are spatial transfers to such regions. The United States has wrestled with how to compensate coal miners for their anticipated dislocation (Eyer and Kahn 2020).

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[3] This project maps CO2 emissions across Europe. The aim is to estimate an emissions inventory for each of the ~116 000 administrative jurisdictions across Europe and the UK. The model spatially disaggregates each country's official (Eurostat) CO2 emissions inventory to places using OpenStreetMap. Vehicle emissions are attributed across fuel stations, train emissions at stations, aviation bunker fuel emissions at airports, and so on. Industrial source emissions are located at the registered address where these emissions physically occur or are legally controlled. Data are for the year 2018.

[4] https://data.worldbank.org/indicator/EN.ATM.CO2E.PC

The Demographic Correlates of Support for Prioritizing Environmental Protection

While developing nations feature a growing middle class who value their increased consumption of durables that often operate using a carbon intensive grid, these same individuals are growing richer because they are urbanizing and obtaining more education. More educated people are more likely to prioritize the environment, understand their own health production function and be more likely to make long run trade-offs even if they incur costs today (Becker and Mulligan 1998, Costa and Kahn 2004, Kahn 2002).

We turn to the World Values Survey Wave 7 and use these microdata to study self-reported environmentalism. We study how such prioritization of protecting the environment is associated with a person's age, education, and income. We document that more educated people (who are richer) are more likely to be pro-environment.

Table 7 lists the nations included in the WVS wave from 2020. We use these data to estimate a linear probability model for person i in nation j.

$$Y_{ij} = \alpha_j + B * X_{ijt} + U_{ijt} \qquad (2)$$

Table 8 reports three estimates of equation (2). In columns (1) and (2), we report linear probability models. In column (1), the survey question focuses on whether protecting the environment is the respondent's priority rather than economic growth.

In the regression, we include nation fixed effects. We find that a respondent's education is monotonically associated with greater support for protecting the environment. Relative to a person with very little education, a college graduate is 13 percentage points more likely to prioritize environmental protection. The mean of the dependent variable is 0.55. Younger people and rural people are more likely to prioritize environmental protection. More liberal people are also more likely to prioritize environmental protection. We fail to reject the hypothesis that self-reported personal income has no effect on support for environmental protection. From the coefficients on these survey responses, we view the education results and the age effects to be the most important. A college educated 30-year-old is more than 16 percentage points more likely to prioritize the environment than a 60-year-old with a high school degree.

In column (2) of Table 8, we explore how one's propensity to vote is associated with individual level attributes. Older, more educated people are much more likely to vote than younger, less educated people. Finally, in column (3) we explore how personal ideology on a liberal to conservative scale is associated with individual attributes. Richer people are less likely to be right wing. Urbanites and more educated people are less likely to be right wing. Older people are much more likely to be right wing.

IV. Conclusion

Without placing an explicit price on carbon emissions, billions of people are not internalizing the social costs of their consumption choices. In richer nations, millions of people are deeply concerned about the climate change challenge and are willing to pay to slow down this global public bad. In the developing world, billions of people are seeking to achieve middle class status and prioritize their own material gains. A core political economy challenge arises as richer nations seek to convince poorer nations to adopt the textbook Pigouvian policy solution.

In this paper, we have presented new empirical work that indicates that implementation is becoming more challenging over time as there are more stakeholders due to the growth of the middle class in developing nations. This emerging middle class seeks to purchase energy intensive durable assets such as vehicles, air conditioners, and computers. These assets increase standards of living, allowing more people to access jobs, amenities, and information, as well as alleviate the hardships from rising global temperatures. However, rising demand for durables will increase greenhouse gas emissions if developing nations have a carbon intensive electricity grid and transportation sector. This consumption growth causes a political economy challenge due to the carbon intensive lock-in effect that stiffens resistance to pricing emissions; the middle class in LMICs will support low carbon policies if they are compatible with their growing demand for consumer durables.

Our empirical work highlights the offsetting factors that emerge in an urbanizing nation where incomes are rising. Rising incomes cause greater consumption but are associated with increased educational attainment. We have used several data sets to explore how these two factors influence support for addressing a global externality.

By estimating international Engel curves for energy intensive durables, we document that the growth of the urban middle class will increase electricity demand and that the grid around the world continues to be carbon intensive. Using data from California, we have documented that even in this rich, progressive state the vast majority of vehicles are gasoline fueled. Even in richer zip codes, the electric vehicle percentages are quite low. Unlike for local pollutants such as PM2.5, there is little evidence of an inverted "U" shape between carbon dioxide emissions and income. Richer people produce more greenhouse gas emissions in the absence of a global carbon treaty. Within Europe, we document that there are many cities featuring a high carbon average footprint. Such area's middle class is likely to oppose carbon pricing. Those high carbon areas will feature elected officials who will be unlikely to embrace the green economy agenda. In this sense, our paper pinpoints pockets of "green resistance".

In the final section of the paper, we use global micro data from the WVS to explore the correlates of environmental concern. Younger, more educated people are more likely to prioritize environmental protection. Such politically involved demographic groups help to overcome the free-rider problem that no one voter feels that her own activism matters.

Future research should explore how a low-carbon coalition engages in persuading the emerging middle class to join their coalition. Stavins (2022) posits that more social education on the risks of climate change can increase demand for carbon mitigation policies. The role of social media and salient events such as natural disaster shocks in stimulating short run demand for public safety investment merits more research (DellaVigna and La Ferrara 2015, Deryugina 2013).

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Table 1

Nations Included in the Engel Curve Regressions

Nation	Year
Albania	2008
Angola	2008
Argentina	2003
Armenia	2005
Austria	2004
Azerbaijan	2002
Bangladesh	2000
Belarus	1998
Belgium	2004
Benin	2015
Bhutan	2003
Bolivia	2000
Bosnia and Herzegovina	2007
Botswana	2009
Brazil	2001
Bulgaria	2007
Burkina Faso	2009
Burundi	2006
Cabo Verde	2007
Cameroon	2007
Central African Republic	2008
Chad	2011
Chile	2000
Colombia	2001
Comoros	2004
Congo, Dem. Rep.	2012
Congo, Rep.	2011
Costa Rica	1989
Côte d'Ivoire	2008
Croatia	2009
Cyprus	2005
Czech Republic	2005
Denmark	2004
Djibouti	2012
Dominican Republic	2000
Ecuador	2003

Egypt, Arab Rep.	2010
El Salvador	2000
Estonia	2004
Eswatini	2009
Ethiopia	2010
Fiji	2002
Finland	2004
France	2004
Gabon	2005
Gambia, The	2010
Georgia	2002
Ghana	2005
Greece	2004
Guatemala	2000
Guinea	2012
Guinea-Bissau	2010
Haiti	2012
Honduras	2001
Hungary	2005
Iceland	2004
India	1993
Indonesia	2005
Iran, Islamic Rep.	2009
Iraq	2006
Ireland	2004
Italy	2004
Jordan	2006
Kazakhstan	2001
Kenya	2005
Kiribati	2006
Kosovo	2009
Kyrgyz Republic	2005
Lao PDR	2002
Latvia	2005
Lebanon	2011
Lesotho	2017
Liberia	2007
Lithuania	2005
Luxembourg	2004
Madagascar	2010
Malawi	2010
Malaysia	2016
Maldives	2002
Mali	2009

Malta	2007
Marshall Islands	2019
Mauritania	2008
Mauritius	2012
Mexico	1989
Micronesia, Fed. Sts.	2013
Moldova	2007
Mongolia	2010
Montenegro	2006
Morocco	2000
Mozambique	2008
Myanmar	2015
Namibia	2009
Nauru	2012
Nepal	2003
Netherlands	2005
Nicaragua	2001
Niger	2011
Nigeria	2018
North Macedonia	2004
Norway	2004
Pakistan	2001
Panama	2000
Papua New Guinea	2009
Paraguay	2001
Peru	1997
Philippines	2006
Poland	2005
Portugal	2004
Romania	2006
Russian Federation	2007
Rwanda	2010
Samoa	2008
São Tomé and Príncipe	2010
Senegal	2011
Serbia	2004
Seychelles	2006
Sierra Leone	2011
Slovak Republic	2005
Slovenia	2005
Solomon Islands	2012
Somalia	2017
South Africa	2010
South Sudan	2009

Spain	2004
Sri Lanka	2002
Sudan	2009
Sweden	2004
Switzerland	2007
Tajikistan	2009
Tanzania	2011
Thailand	2006
Timor-Leste	2001
Togo	2011
Tonga	2009
Tunisia	2005
Turkey	2004
Tuvalu	2010
Uganda	2012
Ukraine	2005
United Kingdom	2005
Uruguay	1992
Vanuatu	2010
Vietnam	2006
West Bank and Gaza	2004
Yemen, Rep.	2005
Zambia	2010
Zimbabwe	2017

Table 2

Durable Ownership Share Engel Curve Regressions

	(1) Car	(2) Motorcycle	(3) Air Conditioner	(4) Refrigerator
log(income)	0.139***	0.0259	0.123***	0.129***
	(0.0213)	(0.0204)	(0.0203)	(0.0365)
Constant	0.162***	0.318***	0.0713***	0.511***
	(0.0188)	(0.0175)	(0.0147)	(0.0316)
Mean Y	0.3583	0.1608	0.14	0.6214
Nation/Year Fixed Effect	Yes	Yes	Yes	Yes
Countries Included	84	79	70	84
Observations	775	595	540	680
R-squared	0.951	0.980	0.926	0.949

The unit of analysis is a nation/year/income quintile. The dependent variable is the share of households who own the durable.
Robust standard errors in parentheses. The standard errors are clustered by country.
*** p<0.01, ** p<0.05, *
p<0.1
The regressions are weighted by the nation's population in the sample year.

Table 3

Durables Ownership Share Engel Curve Regressions

VARIABLES	(1) Computer	(2) Television	(3) Washing Machine	(4) Cell Phone
log(income)	0.180***	0.133***	0.0806***	0.110***
	(0.0120)	(0.0336)	(0.0265)	(0.0153)
Constant	0.0903***	0.591***	0.516***	0.666***
	(0.0104)	(0.0295)	(0.0276)	(0.0130)
Mean Y	0.294	0.7685	0.6395	0.7303
Nation/Year Fixed Effect	Yes	Yes	Yes	Yes
Countries Included	116	89	74	113
Observations	3,050	780	730	2,720
R-squared	0.926	0.909	0.971	0.918

The unit of analysis is a nation/year/income quintile. The dependent variable is the share of households who own the durable.

Robust standard errors in parentheses. The standard errors are clustered by country.

*** p<0.01, ** p<0.05, * p<0.1

The regressions are weighted by the nation's population in the sample year.

Table 4

Macroeconomic Statistics Sorted by Population Size

	2014 Data				
Nation	Population Millions	pm2.5	KWH	Emissions Factor lbs/KWH	GDP Per-Capita 2017 $ PPP
China	1364.270	59.767	3927.045	1.627	11917.340
India	1295.601	89.622	804.516	1.726	5116.629
United States	318.386	8.221	12993.966	1.141	57213.270
Indonesia	255.128	16.455	811.910	1.627	9801.166
Brazil	202.764	13.990	2619.961	0.353	15749.510
Pakistan	195.305	59.518	447.505	1.029	4171.292
Nigeria	176.405	48.633	144.525	0.750	5516.386
Bangladesh	154.517	68.395	320.210	1.103	3511.646
Russian Federation	143.820	16.582	6602.658	0.805	26057.160
Japan	127.276	12.587	7819.715	1.283	39255.280
Mexico	120.355	23.100	2157.324	1.001	18887.570
Philippines	100.513	20.260	696.347	1.323	6973.639
Ethiopia	98.094	35.044	69.199	0.001	1656.635
Vietnam	91.714	34.896	1423.700	0.826	6098.539
Egypt, Arab Rep.	90.425	76.560	1683.213	1.067	10353.670
Germany	80.983	12.751	7035.483	1.123	50770.610
Iran, Islamic Rep.	77.466	38.109	3022.122	1.115	13038.550
Turkey	77.229	42.596	2847.224	1.123	24881.730
Congo, Dem. Rep.	73.767	42.549	108.517	0.002	1029.791
Thailand	68.439	29.365	2538.796	1.128	15854.130
France	66.312	12.290	6939.944	0.077	43021.390
United Kingdom	64.602	10.801	5130.390	0.956	44154.110
Italy	60.789	17.769	5002.407	0.785	39898.530
South Africa	54.544	26.722	4198.046	2.059	12884.480
Myanmar	52.281	40.289	215.299	0.374	4020.037
Korea, Rep.	50.747	27.213	10496.514	1.223	37967.480
Tanzania	49.961	28.874	103.682	0.714	2284.962
Colombia	46.968	18.344	1312.200	0.375	13852.240
Kenya	46.700	28.949	164.325	0.394	3709.153
Spain	46.481	10.075	5355.987	0.630	35968.620
Ukraine	45.272	20.487	3418.569	0.922	12408.950
Argentina	42.670	14.467	3074.702	0.782	23550.100
Algeria	38.924	35.564	1362.872	0.919	11512.710
Poland	38.012	22.211	3971.800	1.886	26649.580
Sudan	37.978	48.142	256.756	0.461	4124.510
Small states	37.861	28.868	.	0.705	20369.980
Uganda	36.912	46.931	.	.	2022.295
Canada	35.437	7.428	15588.487	0.333	47564.610
Iraq	34.412	56.567	1328.231	0.957	9991.616

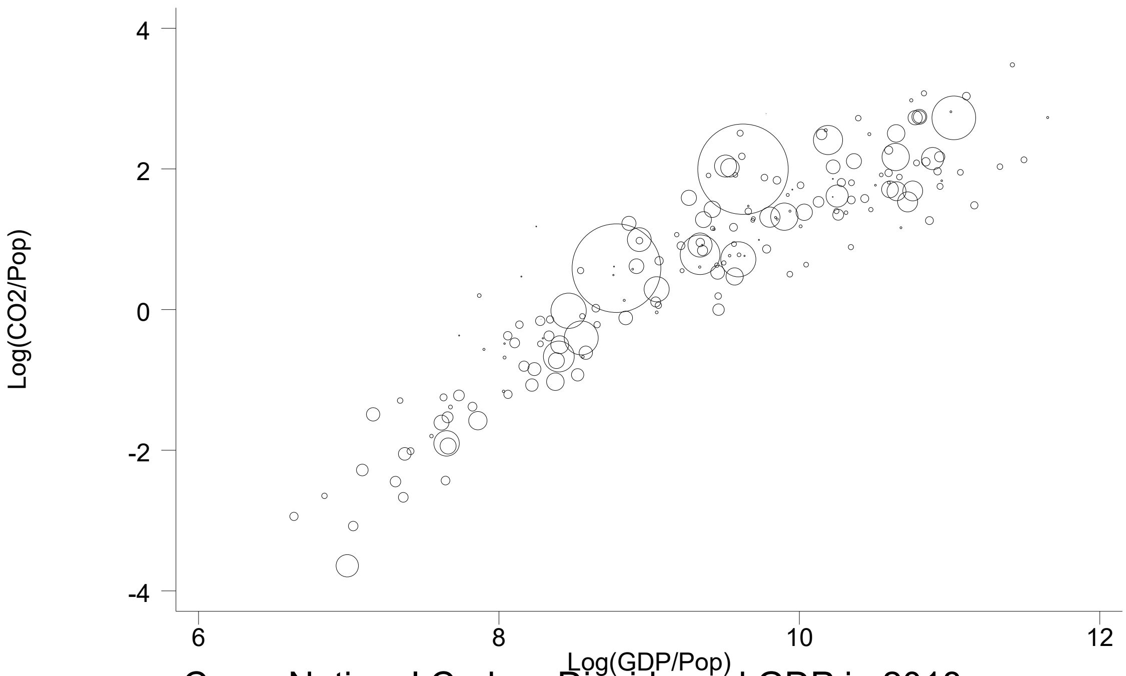
Morocco	34.192	29.949	904.442	1.672	6912.178
Afghanistan	33.371	59.010	.	.	2102.385
Saudi Arabia	30.917	75.608	9401.486	0.975	48209.140
Uzbekistan	30.758	28.900	1645.442	0.773	5764.493
Peru	30.090	27.583	1345.879	0.458	11877.080
Venezuela, RB	30.043	19.104	2719.138	0.460	.
Malaysia	29.867	16.923	4651.951	1.343	23906.230
Other small states	28.364	32.466	.	0.714	22566.880
Ghana	27.224	25.890	351.301	0.166	4670.245
Angola	26.942	32.974	312.229	0.997	8239.831
Nepal	26.906	98.116	146.473	0.001	3217.448
Mozambique	26.286	22.614	478.921	0.080	1217.089
Yemen, Rep.	25.823	48.339	219.800	1.660	.
Korea, Dem. People's Rep.	25.058	35.240	601.689	0.603	.
Madagascar	23.590	23.518	.	.	1540.745
Australia	23.476	9.493	10071.399	1.594	47289.960
Cameroon	22.682	56.715	275.198	0.450	3362.665
Côte d'Ivoire	22.648	20.900	274.730	0.767	4161.940
Sri Lanka	20.778	26.923	531.091	1.316	11428.110
Romania	19.909	15.006	2584.412	0.733	23084.380
Niger	19.240	60.541	51.195	2.155	1127.614
Syrian Arab Republic	18.711	41.534	974.575	1.084	.
Chile	17.759	22.868	3879.673	1.073	24173.060
Burkina Faso	17.586	33.969	.	.	1907.949
Kazakhstan	17.288	13.750	5600.209	1.786	24355.760
Mali	16.934	33.916	.	.	2075.401
Netherlands	16.865	12.829	6712.775	1.185	52187.000
Malawi	16.290	25.198	.	.	1432.055
Ecuador	15.952	16.234	1376.394	0.920	12078.470
Zambia	15.400	28.493	717.347	0.060	3450.038
Guatemala	15.306	26.528	601.190	0.683	7939.375
Cambodia	15.275	28.583	271.367	0.850	3364.278
Senegal	14.175	36.827	229.352	1.819	2868.316
Chad	13.664	51.247	.	.	1866.266
Zimbabwe	13.587	22.806	609.125	0.981	3195.768
Somalia	13.424	30.401	.	.	873.494
Cuba	11.307	21.296	1450.883	1.110	.
Belgium	11.209	13.234	7709.123	0.388	48747.680
Guinea	11.151	21.197	.	.	2061.695
Rwanda	11.084	42.211	.	.	1780.145
Tunisia	11.063	34.692	1454.643	0.893	10498.850
Greece	10.892	17.365	5062.606	1.487	28178.690
Bolivia	10.707	24.819	742.538	0.680	7730.638
South Sudan	10.555	41.901	43.582	2.121	.
Haiti	10.549	16.262	39.056	1.944	2935.220
Czech Republic	10.525	17.391	6258.891	1.152	34386.700
Portugal	10.401	8.785	4662.601	0.684	30444.600
Benin	10.287	29.660	100.225	2.130	2975.855
Dominican Republic	10.165	14.188	1615.515	1.581	14499.630

Hungary	9.866	16.315	3965.958	0.596	26424.720
Burundi	9.844	39.388	.	.	886.235
Sweden	9.696	6.959	13480.148	0.019	49259.000
Azerbaijan	9.535	20.710	2202.394	0.857	14875.780
Belarus	9.475	19.766	3679.979	0.915	19066.890
United Arab Emirates	9.214	37.983	11088.342	0.923	62378.610
Honduras	8.956	23.162	619.837	1.197	5177.415
Jordan	8.919	33.205	1864.932	2.036	10284.670
Austria	8.546	13.379	8355.842	0.277	52857.050
Tajikistan	8.253	46.481	1499.486	0.021	2884.200
Israel	8.216	22.059	6600.898	1.545	37474.850
Switzerland	8.189	11.389	7520.166	0.008	67682.690
Papua New Guinea	7.947	13.245	.	.	3909.339
Hong Kong SAR, China	7.230	.	6083.270	1.905	56359.300
Bulgaria	7.224	20.744	4708.928	1.054	18747.370
Caribbean small states	7.173	19.967	3062.985	.	16095.280
Togo	7.138	28.936	154.665	0.294	1863.282
Serbia	7.131	26.492	4271.745	1.472	15226.320
Sierra Leone	7.017	17.698	.	.	1997.509
Lao PDR	6.640	28.390	.	.	6193.340
Paraguay	6.600	12.641	1552.385	0.000	11643.730
Libya	6.362	47.501	1811.055	1.475	12201.210
El Salvador	6.295	27.503	937.074	0.858	7990.459
Lebanon	6.261	30.445	2588.865	2.107	16970.440
Nicaragua	6.143	19.388	568.314	0.983	5443.278
Kyrgyz Republic	5.836	23.298	1941.222	0.182	4722.086
Denmark	5.643	11.067	5858.802	0.840	52048.340
Singapore	5.470	17.409	8844.688	0.906	87959.410
Turkmenistan	5.466	22.085	2678.766	0.910	12421.370
Finland	5.462	6.469	15249.989	0.354	44976.780
Slovak Republic	5.419	18.304	5137.074	0.351	27384.970
Norway	5.137	7.671	22999.935	0.020	62390.150
Costa Rica	4.795	17.544	1942.491	0.217	18669.100
Congo, Rep.	4.737	45.853	202.873	0.412	5556.705
Ireland	4.658	8.751	5672.064	0.806	58267.410
New Zealand	4.517	6.358	9012.731	0.247	40432.240
Central African Republic	4.464	49.356	.	.	822.611
Liberia	4.360	14.942	.	.	1621.345
Croatia	4.238	18.433	3714.383	0.478	23782.500
West Bank and Gaza	4.173	33.448	.	.	5967.073
Oman	4.027	37.711	6445.581	0.942	30530.500
Mauritania	3.931	43.111	.	.	5008.688
Panama	3.901	12.922	2064.178	0.947	27352.520
Georgia	3.719	22.967	2693.973	0.179	12254.650
Kuwait	3.691	55.624	15590.613	1.718	56647.440
Puerto Rico	3.535	9.089	.	.	34070.250
Bosnia and Herzegovina	3.482	28.777	3446.765	1.396	12066.590
Uruguay	3.400	9.927	3085.190	0.197	22419.040
Mongolia	2.940	39.295	2006.387	2.137	10980.320

Lithuania	2.932	12.845	3821.145	0.521	29855.830
Armenia	2.912	33.086	1961.610	0.386	11019.840
Albania	2.889	18.884	2309.367	0.000	11586.860
Jamaica	2.875	14.074	1050.733	1.921	9438.477
Moldova	2.857	16.726	1725.617	0.857	10314.410
Qatar	2.459	78.833	14781.624	0.910	95578.260
Pacific island small states	2.324	12.005	.	.	6753.211
Namibia	2.273	26.018	1652.572	0.018	10413.310
Botswana	2.089	24.151	1815.554	2.206	17264.400
North Macedonia	2.078	31.791	3496.520	1.629	14524.190
Slovenia	2.062	16.633	6727.999	0.509	33098.950
Lesotho	2.043	33.080	.	.	2639.446
Gambia, The	2.024	30.622	.	.	2038.802
Latvia	1.994	14.879	3507.405	0.414	25387.010
Gabon	1.884	41.320	1167.852	0.696	15437.260
Kosovo	1.813	.	2818.337	2.148	9214.406
Guinea-Bissau	1.692	26.941	.	.	1740.897
Trinidad and Tobago	1.362	24.856	7092.959	0.913	28796.560
Bahrain	1.336	62.759	19596.983	0.910	48201.160
Estonia	1.315	7.706	6732.368	0.104	30602.600
Mauritius	1.261	15.293	2182.509	1.732	19240.220
Timor-Leste	1.174	20.450	.	.	3264.563
Cyprus	1.152	18.294	3624.934	1.975	33207.770
Equatorial Guinea	1.122	44.302	.	.	32436.550
Eswatini	1.095	17.979	.	.	8192.528
Djibouti	0.899	41.260	.	.	4238.944
Fiji	0.866	11.923	.	.	12057.990
Guyana	0.763	23.648	.	.	11244.450
Comoros	0.759	21.502	.	.	2996.379
Bhutan	0.719	40.840	.	.	9574.029
Montenegro	0.622	21.947	4612.341	0.990	17674.620
Macao SAR, China	0.590	.	.	.	155201.400
Solomon Islands	0.587	12.172	.	.	2551.401
Luxembourg	0.556	10.858	13914.678	0.693	108414.800
Suriname	0.553	25.999	3596.745	0.802	20211.000
Cabo Verde	0.518	31.621	.	.	6281.794
Maldives	0.435	9.921	.	.	17568.410
Malta	0.435	14.435	4924.544	2.059	37230.280
Brunei Darussalam	0.410	6.181	10290.938	0.921	64190.820
Bahamas, The	0.371	18.495	.	.	35659.930
Belize	0.353	24.421	.	.	7323.145
Iceland	0.327	6.949	53832.479	0.000	50450.740
Barbados	0.285	25.183	.	.	15041.550
French Polynesia	0.272	.	.	.	.
New Caledonia	0.268	.	.	.	.
Vanuatu	0.264	11.934	.	.	2984.605
São Tomé and Príncipe	0.196	27.862	.	.	3720.787
Samoa	0.192	12.644	.	.	5785.488
St. Lucia	0.178	24.236	.	.	14288.820

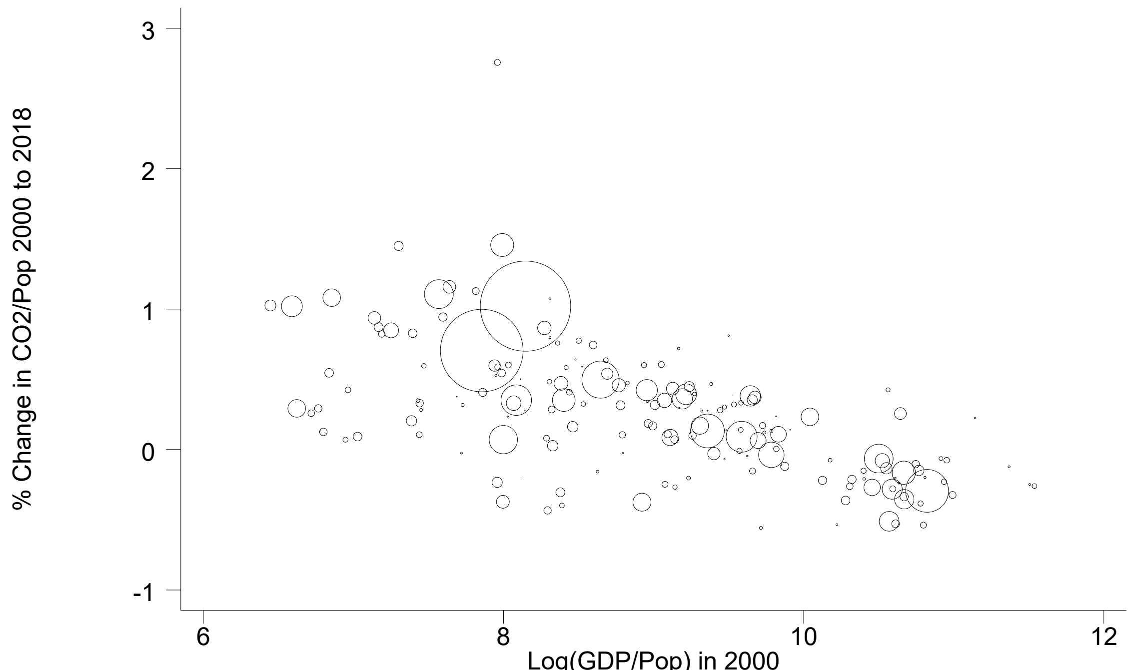
Channel Islands	0.164	.	.	.	.
Guam	0.161	12.023	.	.	.
Curacao	0.156	.	4797.670	.	26826.590
Kiribati	0.109	11.394	.	.	1992.234
Grenada	0.109	24.287	.	.	14317.330
St. Vincent and the Grenadine	0.109	23.031	.	.	11845.210
Virgin Islands (U.S.)	0.108	11.166	.	.	.
Micronesia, Fed. Sts.	0.107	11.867	.	.	3340.203
Aruba	0.104	.	.	.	35875.630
Tonga	0.101	12.058	.	.	5861.464
Antigua and Barbuda	0.093	19.726	.	.	18104.410
Seychelles	0.091	20.971	.	.	24848.610
Isle of Man	0.083	.	.	.	.
Andorra	0.079	10.830	.	.	.
Dominica	0.071	21.010	.	.	12216.530
Bermuda	0.065	12.806	.	.	77361.100
Cayman Islands	0.061	.	.	.	66326.890
Marshall Islands	0.057	11.070	.	.	3545.207
Greenland	0.056	12.511	.	.	.
American Samoa	0.056	13.317	.	.	.
Northern Mariana Islands	0.055	10.313	.	.	.
St. Kitts and Nevis	0.051	.	.	.	25521.200
Faroe Islands	0.048	.	.	.	.
Sint Maarten (Dutch part)	0.038	.	.	.	42946.680
Monaco	0.037	.	.	.	.
Liechtenstein	0.037	.	.	.	.
St. Martin (French part)	0.036	.	.	.	.
Turks and Caicos Islands	0.035	.	.	.	24392.020
Gibraltar	0.034	.	5692.937	2.130	.
San Marino	0.033	.	.	.	57328.080
British Virgin Islands	0.029	.	.	.	.
Palau	0.018	.	.	.	17091.230
Tuvalu	0.011	.	.	.	3447.796
Nauru	0.010	.	.	.	13175.920
Eritrea	.	44.375	96.635	2.119	.

Figure 1



Cross-National Carbon Dioxide and GDP in 2018

Figure 2



The Growth in Carbon Emissions Versus Log(GDP) in 2000

Table 5

The California Vehicle Stock's Fuel Type Distribution and Age Distribution in 2018 and 2020

	All	Rich	Non-Rich	All	Rich	Non-Rich
	October 1st 2018			January 1st 2020		
Fuel Type						
Battery Electric	0.74	1.79	0.37	1	2.47	0.49
Diesel and Diesel Hybrid	3.98	2.81	4.34	3.92	2.76	4.27
Flex-Fuel	4.06	3.13	4.38	3.89	2.9	4.23
Gasoline	86.91	85.34	87.5	86.62	84.65	87.34
Hybrid Gasoline	3.5	5.49	2.82	3.63	5.56	2.98
Hydrogen Fuel Cell	0.02	0.04	0.01	0.02	0.05	0.01
Natural Gas	0.11	0.07	0.12	0.09	0.05	0.1
Other	0.02	0.01	0.03	0.02	0.01	0.02
Plug-in Hybrid	0.67	1.32	0.44	0.81	1.54	0.56
Model Year						
% Model Year Before 2010	51.81	43.1	54.74	46.01	37.33	48.89
% Model Year Between 2010 and 2015	28.88	32.3	27.74	27.71	29.98	26.97
% Model Year After 2015	19.31	24.61	17.52	26.28	32.68	24.14

Each column for Fuel Type adds up to 100% Each column for Model Year adds up to 100%. Rich represents the set of zip codes whose percentage of tax filers with a reported income of over $200,000 in the year 2018 is greater than 10.6%. This represents the 75^{th} percentile of the cross-zip code distribution. Non-Rich represents the remaining zip codes.

Table 6

Within European Nation Variation in Per-Capita Carbon Emissions

Nation	Count	Mean	CV	Mean	CV
Austria	2107	12.372	1.419	10.442	1.890
Belgium	581	10.338	1.929	12.664	2.219
Bulgaria	270	5.328	4.014	4.923	2.993
Croatia	530	7.249	2.817	6.146	2.579
Cyprus	65	42.061	6.033	4.230	7.531
Czech-Republic	6778	12.976	13.437	10.813	10.089
Denmark	100	10.817	0.950	9.323	0.846
Estonia	4097	39.905	56.237	6.842	91.908
Finland	312	22.948	1.273	14.788	1.161
France	34882	9.729	6.077	6.098	6.090
Germany	11013	12.962	9.915	10.425	5.020
Great Britain	11522	26.145	7.919	7.359	8.244
Greece	330	9.473	2.542	6.307	2.784
Hungary	3156	9.734	7.993	6.077	7.565
Iceland	15	1.627	0.981	1.078	0.849
Ireland	103	9.146	1.116	8.161	0.986
Italy	7920	9.423	4.038	6.402	3.178
Latvia	119	12.017	1.189	7.334	1.384
Liechtenstein	11	3.972	0.458	3.933	0.539
Lithuania	517	11.720	1.635	6.942	2.854
Luxembourg	105	26.180	2.455	21.154	2.234
Malta	67	3.418	3.012	3.090	3.422
Netherlands	358	12.336	1.760	12.509	1.795
Norway	356	14.136	1.261	9.859	1.702
Poland	2478	10.313	11.286	8.588	8.470
Portugal	307	8.976	3.630	6.009	3.515
Romania	664	6.412	4.367	5.459	3.841
Slovak Republic	79	6.420	1.215	6.694	1.269
Slovenia	210	9.413	2.961	8.283	3.305
Spain	8156	19.408	9.367	6.687	4.347
Sweden	294	20.042	6.610	8.582	1.436
Switzerland	2214	9.119	2.972	4.885	2.505
Turkey	974	2.412	4.102	1.263	2.069
Ukraine	5007	29.431	5.376	8.546	1.743
Population Weighted		Yes		No	

Table 7

Macroeconomic Statistics for Nations in the World Values Survey Sample

WVS nations	Population Millions	pm2.5	KWH	2014 Data Emissions Factor lbs/KWH	GDP Per-Capita 2017 $ PPP
Andorra	0.08		10.83		
Argentina	42.67	3074.7	14.47	0.78	23550.1
Australia	23.48	10071.4	9.49	1.59	47289.96
Bangladesh	154.52	320.21	68.4	1.1	3511.65
Bolivia	10.71	742.54	24.82	0.68	7730.64
Brazil	202.76	2619.96	13.99	0.35	15749.51
Chile	17.76	3879.67	22.87	1.07	24173.06
China	1364.27	3927.04	59.77	1.63	11917.34
Colombia	46.97	1312.2	18.34	0.37	13852.24
Cyprus	1.15	3624.93	18.29	1.97	33207.77
Germany	80.98	7035.48	12.75	1.12	50770.61
Ecuador	15.95	1376.39	16.23	0.92	12078.47
Egypt, Arab Rep.	90.42	1683.21	76.56	1.07	10353.67
Ethiopia	98.09	69.2	35.04	0	1656.63
Greece	10.89	5062.61	17.37	1.49	28178.69
Guatemala	15.31	601.19	26.53	0.68	7939.37
Hong Kong SAR, China	7.23	6083.27		1.9	56359.3
Indonesia	255.13	811.91	16.45	1.63	9801.17
Iran, Islamic Rep.	77.47	3022.12	38.11	1.11	13038.55
Iraq	34.41	1328.23	56.57	0.96	9991.62
Jordan	8.92	1864.93	33.21	2.04	10284.67
Japan	127.28	7819.71	12.59	1.28	39255.28
Kazakhstan	17.29	5600.21	13.75	1.79	24355.76
Kyrgyzstan	5.84	1941.22	23.3	0.18	4722.09
Korea, Rep.	50.75	10496.51	27.21	1.22	37967.48
Lebanon	6.26	2588.86	30.44	2.11	16970.44
Macao SAR, China	0.59				155201.41
Mexico	120.36	2157.32	23.1	1	18887.57
Myanmar	52.28	215.3	40.29	0.37	4020.04
Malaysia	29.87	4651.95	16.92	1.34	23906.23
Nigeria	176.4	144.53	48.63	0.75	5516.39
Nicaragua	6.14	568.31	19.39	0.98	5443.28
New Zealand	4.52	9012.73	6.36	0.25	40432.24
Pakistan	195.31	447.51	59.52	1.03	4171.29
Peru	30.09	1345.88	27.58	0.46	11877.08
Philippines	100.51	696.35	20.26	1.32	6973.64
Puerto Rico	3.53		9.09		34070.25

Romania	19.91	2584.41	15.01	0.73	23084.38
Russian Federation	143.82	6602.66	16.58	0.81	26057.16
Serbia	7.13	4271.74	26.49	1.47	15226.32
Thailand	68.44	2538.8	29.36	1.13	15854.13
Tajikistan	8.25	1499.49	46.48	0.02	2884.2
Tunisia	11.06	1454.64	34.69	0.89	10498.85
Turkey	77.23	2847.22	42.6	1.12	24881.73
Ukraine	45.27	3418.57	20.49	0.92	12408.95
United States	318.39	12993.97	8.22	1.14	57213.27
Vietnam	91.71	1423.7	34.9	0.83	6098.54
Zimbabwe	13.59	609.12	22.81	0.98	3195.77

Table 8

World Value Survey Regressions

VARIABLES	(1) Protect Environment	(2) Always Vote	(3) Right Wing Ideology
Income	-0.000152	0.000768***	0.0135***
	(0.000235)	(0.000213)	(0.00115)
Primary Education	0.0106	0.0305***	0.00879
	(0.0124)	(0.0112)	(0.0608)
Lower Secondary	0.0225*	0.0226*	-0.0359
	(0.0127)	(0.0115)	(0.0623)
Upper Secondary	0.0515***	0.0530***	-0.0985*
	(0.0121)	(0.0110)	(0.0594)
Post-Secondary	0.0850***	0.104***	-0.192***
	(0.0143)	(0.0130)	(0.0703)
Tertiary Education	0.0868***	0.104***	-0.167**
	(0.0146)	(0.0132)	(0.0714)
Bachelors	0.133***	0.159***	-0.289***
	(0.0131)	(0.0119)	(0.0642)
Masters	0.131***	0.138***	-0.266***
	(0.0159)	(0.0144)	(0.0779)
Doctoral Degree	0.127***	0.190***	-0.662***
	(0.0250)	(0.0228)	(0.123)
Right Wing Ideology	-0.0105***	0.00340***	
	(0.000986)	(0.000896)	
Female	0.00680	-0.0198***	-0.0508**
	(0.00470)	(0.00427)	(0.0231)
Urban	-0.0221***	-0.0199***	-0.199***
	(0.00581)	(0.00528)	(0.0285)
Age 41 to 60	-0.0168***	0.153***	0.112***
	(0.00545)	(0.00495)	(0.0267)
Age 60+	-0.0367***	0.241***	0.320***
	(0.00726)	(0.00660)	(0.0356)
Constant	0.580***	0.482***	5.729***
	(0.0142)	(0.0129)	(0.0638)
Nation Fixed Effect	Yes	Yes	Yes
Mean of Y	0.55	0.572	5.721
Observations	42,726	42,726	42,726
R-squared	0.054	0.146	0.078

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The Omitted Category are Males with early childhood education who are 40 years or younger.

For col 1, the survey asks preferences for protecting the environment vs. economic growth. “Here are two statements people sometimes make when discussing the environment and economic growth. Which of them comes closer to your own point of view? A. Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs B. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent 1.- A: Protect environment 2.- B: Economic growth .”

For col 2, the survey assesses voting in elections -- Vote in elections: National level 1.- Always 2.- Usually is coded as “voting”

For col 3, the surveys assess people’s personal ideologies - Left-right political scale: In political matters, people talk of "the left" and "the right." How would you place your views on this scale, generally speaking? 1.- Left 2.- 2 3.- 3 4.- 4 5.- 5 6.- 6 7.- 7 8.- 8 9.- 9 10.- Right