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Public Perceptions of Climate Mitigation Policies: Evidence from Cross-Country Surveys

Prepared by Era Dabla-Norris, Thomas Helbling, Salma Khalid, Hibah Khan, Giacomo Magistretti, Alexandre Sollaci, and Krishna Srinivasan

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Authorized for distribution by Krishna Srinivasan

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ABSTRACT: Building public support for climate mitigation is a key prerequisite to making meaningful strides toward implementing climate mitigation policies and achieving decarbonization. Using nationally representative individual-level surveys for 28 countries, this note sheds light on the individual characteristics and beliefs associated with climate risk perceptions and preferences for climate policies. Preexisting beliefs regarding policy efficacy, costs and benefits, and progressivity are important drivers of support for carbon pricing. Public acceptability of carbon pricing increases if revenues are used to address distibributional concern or to subsidize green infrastructure and low-carbon technologies. Information experiments highlight the importance of improving support for policies with salient information on policy efficacy and co-benefits. The surveys suggest that securing cooperation among countries could induce greater political support for climate action.

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Authors' email addresses:	edablanorris@imf.org; thelbling@imf.org; hkhan2@imf.org; skhalid@imf.org; gmagistretti@imf.org; abalduinosollaci@imf.org; ksrinivasan@imf.org

* The views expressed in Staff Discussion Notes are solely those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

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Executive Summary

Tackling climate change is an urgent and fundamental challenge. While progress has been made in terms of policy commitments, ambitions and implementation still lag well behind what is needed to make a real dent in reducing greenhouse gas emissions and limiting global warming to between 1.5 and 2°C. Garnering public buy-in for climate policies can help countries achieve climate goals.

In this note, we use novel international surveys for 28 advanced and emerging market economies to examine how individual characteristics and beliefs shape climate risk perceptions and preferences for three main climate policies—carbon pricing, regulations, and subsidies for low-carbon technologies and renewable energy. The surveys were conducted at a time when high energy prices and their cost-of-living impacts were particularly salient for the public. Across countries, most people surveyed were concerned about climate change, with a higher share in emerging market economies already feeling its effects compared with advanced economies, but that concern alone does not translate into across-the-board support for policies. Policy attributes matter, as does knowledge and information about policy impacts. Specifically, we find that

- Along with climate risk perceptions, three key policy attributes are major predictors of whether people support carbon pricing: (1) perceived effectiveness in reducing emissions, (2) perceived fairness or distributional burden, and (3) perceived other or co-benefits in terms of improved air quality, health outcomes, and new jobs. This suggests that providing information about climate change impacts, how carbon pricing works, options for revenue recycling, and improving awareness of policy co-benefits can all be critical to garnering acceptance of carbon pricing.

- Concerns about policy costs and effectiveness are top of mind among respondents who oppose carbon pricing. Striving for clear and effective communication about policy efficacy and trade-offs, as well as how carbon pricing can be made progressive, is crucial. The surveys show that carbon pricing can receive stronger support if revenues are redistributed to low-income households, used to increase social spending on health care and education, or earmarked to fund green infrastructure and low-carbon technologies.

- Co-benefits of climate policy resonate strongly with the public and can counter the erosion of support for climate action when cost implications of policies are presented. Highlighting the co-benefits of climate policies, such as improved air quality, health benefits, less road congestion, and job creation can help ameliorate the sensitivity of the public to negative price considerations.

- Complementary measures and frameworks are needed to bolster support for climate mitigation policies. Distributional considerations warrant strengthened social protection systems. Similarly, concerns about corruption can result in opposition to subsidies for low-carbon technologies and renewables, particularly in emerging market economies. This suggests that government spending efficiency matters when it comes to improving the acceptability of climate policies. Strengthened social safety nets, active labor market policies, clear and transparent emissions regulations, supply-side policies ensuring adequate and affordable low-carbon energy supply, and green public financial

management systems are thus important enablers of an integrated government strategy to combat climate change.

- The surveys point to broader-than-expected support for collective action and greater common ground for crafting international agreements. Most respondents across all countries think that climate change policy will be effective only if most countries adopt measures to reduce carbon emissions. Further, in contrast to their government's stated positions, respondents in most emerging market countries also think that all countries should pay to address climate change and that burden sharing should be based on current rather than historical emissions. This suggests that securing cooperation among countries could induce greater political support for climate action.

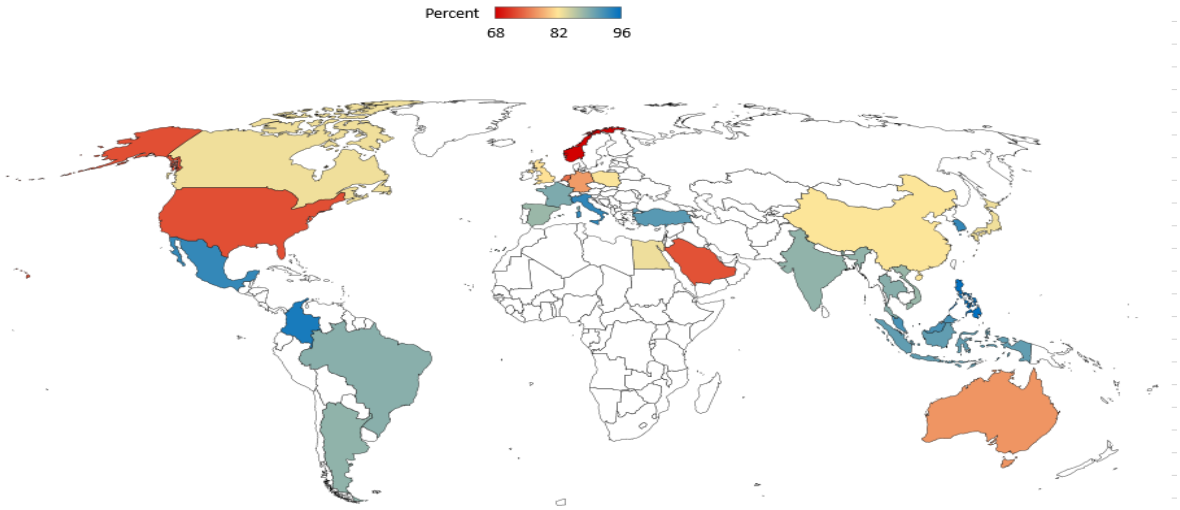
- Overall, the surveys underscore the critical importance of effective communication and building awareness with respect to climate policy options. There remains significant scope for improving overall knowledge of climate change impacts and policies across all countries. Further, the interventions highlight how even small amounts of information on policy benefits can engender greater support. This support, however, may be short-lived if policy trade-offs are not made explicit, highlighting the importance of ensuring that the public understands the relative costs and benefits of available policy options.

Introduction

Closing climate ambitions and policy gaps: Limiting global warming to 1.5 to 2°C above preindustrial levels requires cutting global emissions by one-quarter to one-half over the next decade (Black and others 2021). About 135 countries, representing more than three-quarters of global greenhouse gas emissions, have committed to achieving net zero by mid-century. But the world is not yet on track to "keep 1.5 alive," and recent surges in energy prices could complicate the achievement of temperature goals.[1] Even with sufficiently ambitious pledges, wide-ranging policies are needed to implement the emissions cuts. Closing climate ambitions and policy gaps therefore remains an urgent global priority to prevent disastrous outcomes for people and economies (Georgieva 2021).

Public perceptions and support for climate policies: Public support for climate policies is essential to reach net zero. A range of recent global surveys, including the one analyzed in this note, show that most people surveyed consider climate change a serious problem (Dabla-Norris and others, forthcoming(a); Leiserowitz and others 2021, Figure 1). This realization could, in principle, present a clear and compelling call for decision-makers to step up their ambitions. However, people's recognition of the situation does not always translate into broad-based support for climate policies. Some of the economically most efficient climate policies, such as a comprehensive pricing of carbon emissions, often face political resistance.[2] As such, understanding attitudes toward climate change, which factors shape public support for climate policies across different countries, and which groups tend to hold different views is critical to help formulate effective policy responses.

Figure 1. Share of Respondents Who Think Climate Change Is a Serious Problem



Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the shares of those surveyed in each country who responded, "a very serious problem" or "fairly serious problem" to the question "In your view, how serious of a problem is climate change?"

[1] Higher energy prices could hinder green transitions by reducing public appetite for policies that make dirtier energy sources more expensive. Indeed, several countries are stepping up their reliance on fossil fuels for energy production, at least in the short term, in an attempt to limit domestic inflation. At the same time, high oil and coal prices could spur a shift toward renewables, especially in fuel-importing countries.

[2] See Douenne and Fabre (2022) for a discussion of the Yellow Vest movement in France; Klenert and others (2018).

This note: We use a novel set of surveys to examine how people perceive climate mitigation policies across a broad range of countries. The surveys were conducted in the summer of 2022, when surging fuel prices and their cost-of-living impacts were front and center of news cycles and, hence, particularly salient for the public. We seek to gauge public perceptions of three main climate mitigation policies—carbon pricing (carbon taxes, emissions trading systems), regulations, and subsidies for low-carbon technologies and renewable energy. We also seek to understand whether making the costs and co-benefits of climate policies and their distribution explicit impacts support for climate action. Zooming in on carbon pricing, we analyze how people perceive international burden sharing. Finally, we assess whether support for policies can be improved with information.

What we do: We conducted standardized surveys of 30,000 respondents across 28 countries to explore people's beliefs about and preferences for climate mitigation policies. The surveys cover both advanced and emerging market economies and include 20 of the top-25 emitters, as well as 9 of the 25 countries most exposed to climate change. Survey respondents were first asked an open-ended question about what they believe are the attributes of a good climate policy before being prompted to think of specific policies with more directed questions. The surveys contain detailed questions that assess perceptions about the economic impact and distributional consequences of different climate policies, preferences across those policies, and views on policy costs and benefits, with a focus on carbon pricing. Our survey also randomizes information given to participants, which allows us to evaluate the impact of information regarding policy efficacy and costs on policy support.

What we find: The share of people who think that climate change will affect their lives tends to be higher in emerging market economies, many of which are more vulnerable to climate change. However, respondents frequently conflate environmental protection with climate change, and up to 50 percent of respondents in some countries have neutral or no opinions about the need for policy action. Three key policy views are major predictors of whether people support carbon pricing: perceived effectiveness in reducing emissions, perceived distributional fairness, and perceived co-benefits (better air quality, improved health outcomes, and jobs), albeit with differences across countries. Highlighting the costs of carbon pricing policies tends to reduce support, while acceptability increases as policy benefits are made more salient. Policy incidence also impacts support for climate policies, pointing to a significant role for recycling carbon revenues to address distributional concerns. The surveys also indicate a strong sense of collective action across countries. In contrast to their government's stated positions, a sizable share of respondents in emerging market economies think that all countries should pay to address climate change and that burden sharing should be based on current rather than historical emissions.

Related research: A growing number of studies have examined attitudes about climate change, how climate policies are perceived, and what determines their support (Berquist, Nilsson, and Harring 2022; Bumann 2021; Drews and van den Bergh 2016; and Fairbrother 2022 provide extensive reviews). Most studies on attitudes toward climate policies focus on a single country or a subset of advanced economies, but comparative cross-country surveys on drivers of support for different climate policies in emerging

market economies are relatively scarce.[3] In this respect, our work is closely related to a study by the Organisation for Economic Co-operation and Development that uses comprehensive survey questions to elicit policy views on a range of measures and determine the impact of individual characteristics and beliefs on policy preferences across 20 countries between March 2021 and March 2022 (Dechezleprêtre and others 2022). While our surveys cover a narrower range of policies, our sample includes a larger number of emerging market economies, particularly those highly exposed to climate change. We also measure support for climate policies when high energy prices are particularly salient for the public. This elicits more informed responses on the actual costs (for example, loss of purchasing power) of carbon pricing policies that aim to shift the balance of incentives in favor of greener energy sources by making fossil fuels more expensive.

Road map: The next section describes the methodology and questionnaire and presents selected descriptive statistics. Results of the text analysis based on the open-ended question are followed by a description of support for climate policies, zooming in on carbon pricing and an explanation of the information treatment. The concluding section presents policy recommendations.

Methodology and Questionnaire

Survey and Questionnaire

Data collection: The online survey was conducted between July 5 and August 11, 2022, on our behalf by YouGov, a global leader in data analytics. Respondents were drawn from a pool of pre-profiled panelists and contacted by email. Samples are weighted so that aggregate results are representative of each country's age, gender, education, and regional profiles, as well as the population's employment and socioeconomic status. All surveys were administered in the local language and run online with residents 18 and older. Standard procedures to ensure data quality and integrity were applied, including testing the questionnaire on a small number of participants in pilot countries before it was rolled out.[4]

Country sample: The online survey was conducted on nearly 30,000 individuals across 28 countries, with at least 1,000 individuals interviewed in each country (see Annex 1 for the country list). The sample allows for broad coverage across social norms, institutions, economic contexts, and exposure to climate change. One potential drawback of our data, however, is that the online nature of the surveys renders

[3] A few recent studies have focused on cross-country comparisons, using various methodologies, ranging from the collection of voluntary responses through a game (UNDP 2021), public opinion polls (Pew 2015; Pew 2021), and surveys run through Facebook (Leiserowitz and others 2021).

[4] YouGov uses a panel member incentivization program in which points are accumulated and can be exchanged for cash. Surveys took on average 10–12 minutes to complete. Sampling with replacement eliminates survey nonresponse in our sample, with sampling weights used to maintain representativeness with respect to census information (or industry-accepted data, where census data are unavailable).

them less representative along rural-urban, education, and income lines in many emerging market countries.[5]

Questionnaire: Our questionnaire is composed of four parts (see Technical Appendix A1), designed to gather information on respondents' demographics, views on climate change, policy preferences, and opinions on international cooperation.

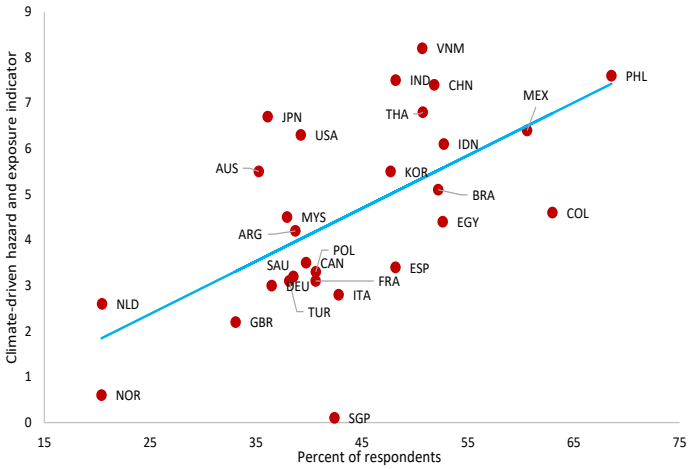
- In the first section of the survey, we collect socioeconomic and demographic characteristics of respondents, including their age, gender, marital status, household size, education, employment status, income, source of news, car ownership, and use of public transportation. In addition, we collect information on perceptions regarding trust in people and government and the role of government in regulation (proxy for economic ideology).
- The second section collects information on respondents' concerns about the seriousness of the threat posed by climate change, its urgency, baseline awareness of key climate policies, and whether they are aware of any climate commitments made by their governments. We also ask an open-ended question on what respondents believe the goal of a good climate policy should be. Finally, we collect baseline information on support for such policies, as well as respondents' beliefs regarding their benefits, costs, and incidence across income groups and businesses.
- The third section introduces information and incidence treatments and reassesses support for a carbon pricing policy to evaluate how these randomizations alter respondents' policy preferences. In the information treatment, half of the respondents are provided with a short text that explains the efficacy of carbon pricing in reducing emissions and creating innovation-friendly incentives for businesses. The other half receive no extra information. The incidence treatment guides respondents through scenarios involving costs of carbon pricing policies, framed as personal for half of respondents and general/societal for the other half. Finally, the section collects information on redistributive preferences regarding revenue recycling from carbon pricing and preferences for alternative climate policies such as regulations and subsidies for low-carbon technology and renewables.
- In the final section, we assess respondents' perceptions of international burden sharing. This includes assessing whether participants believe that all countries need to adopt climate policies for them to be effective, and whether countries have different burdens of responsibility based on past or current emissions.

[5] Survey weights are utilized for all analysis in order to ensure representativeness with respect to census data (or industry data, where census data are unavailable). Detailed analysis of representativeness is presented in Dabla-Norris and others (forthcoming[b]).

Selected Descriptive Statistics

Climate concern and imminence: As shown in Figure 1, most respondents see climate change as a serious concern, but beliefs about its urgency and imminence vary across countries. A higher share of respondents in developing economies believe climate change is already happening and is personally affecting them and their families (Figure 2). For example, over 60 percent of respondents in Colombia, Mexico, and the Philippines perceive the personal effects of climate change to be imminent, compared with only 20 percent in The Netherlands and Norway. Over 10 percent of respondents in the United States and Australia think that climate change will not harm them during their lifetimes. Overall, respondents' concerns about climate change are positively associated with their country's vulnerability to climate change. This suggests that weaker perceptions regarding imminence of climate change in advanced economies could be a result of lower exposure to extreme climate events or better coping capacity in the face of extreme weather.

Correlation INFORM Risk Index and Climate Change Imminence



Source: IMF staff calculations based on IMF-YouGov survey and IMF's INFORM Risk index.
Note: This figure shows the share of favorable responses in each country to the question "Climate change is affecting me or my family right now" (horizontal axis) and the climate-driven hazard and exposure component of the climate-driven INFORM risk index in 2022. Data labels use International Organization for Standardization (ISO) country codes.

Figure 2. Imminence of Climate Change
(Percent of respondents)

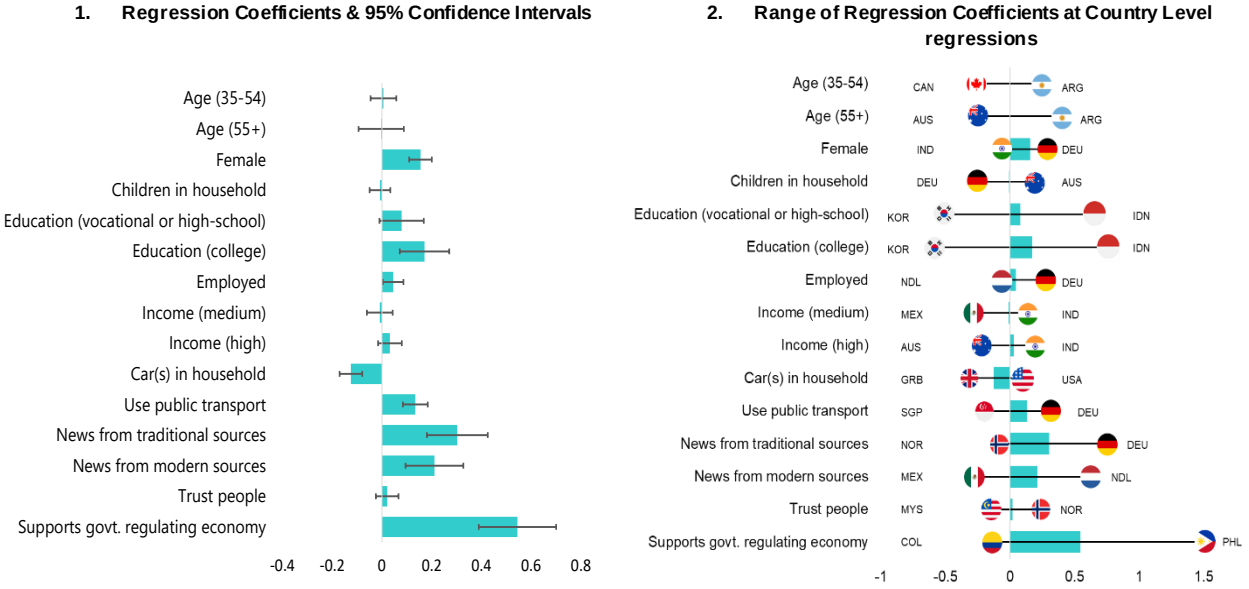
		Asia Pacific	Philippines	Singapore	Korea	Malaysia	Japan	India	Vietnam	China	Indonesia	Thailand	Australia	Americas	Colombia	Mexico	Brazil	Canada	Argentina	USA	Middle East	Egypt	Saudi Arabia	Europe	Italy	UK	Spain	Germany	France	Türkiye	Poland	The Netherlands	Norway
Other people	Right now		89	79	75	75	71	70	74	70	69	68	67		86	81	75	75	74	63		67	54		77	75	74	73	73	68	64	59	55
	Next 5 to 10 years		6	12	17	17	14	21	18	17	22	21	12		10	14	12	10	14	10		18	24		12	7	13	11	16	20	16	17	18
	Over 10 years from now		3	4	4	4	4	5	5	10	4	5	7		2	3	5	5	6	6		7	9		6	6	7	6	6	7	9	12	11
	Won't ever affect		1	1	1	1	3	1	1	1	1	1	8		1	1	3	5	1	10		2	5		2	5	2	4	1	1	5	4	5
You or your family	Right now		69	42	48	38	36	48	53	52	53	51	35		63	61	52	40	39	39		53	39		43	33	48	36	41	38	41	20	20
	Next 5 to 10 years		22	39	37	44	35	32	32	27	29	33	32		27	29	27	33	34	23		24	30		36	34	32	33	39	44	31	38	36
	Over 10 years from now		6	10	10	12	13	10	11	15	8	7	13		6	6	10	10	14	12		9	12		10	15	11	14	12	10	12	23	22
	Won't ever affect		2	2	2	2	4	5	1	2	4	3	11		1	1	4	7	2	13		5	9		3	8	3	7	2	3	7	7	8

Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the distribution pf responses in each county to the questions "*Which of the following comes closest to your view of how climate change is affecting people around the world?"* (top panel) and *"Which of the following comes closest to your view of how climate change will affect you or your family?"* (bottom panel).

Drivers of climate risk perceptions: We explore how socioeconomic characteristics, lifestyle, and energy usage correlate with climate risk perceptions across and within countries. On average, concerns about climate change are more prevalent among the more educated, those who support government's

role in regulating the economy, and female respondents (Figure 3).[6] There are mixed patterns across countries for age, with higher climate concerns among younger respondents in Australia and Canada compared with Argentina, where older respondents are systematically more concerned about climate change. We also find stronger concerns from respondents who follow the news, especially traditional news sources such as newspaper, television, and radio. Opposition to climate policies is strongly correlated with lower availability of public transportation and greater reliance on cars. Finally, household income is not associated with stronger climate concern, with a few notable exceptions, including Australia, Mexico, the Philippines, and the United States.

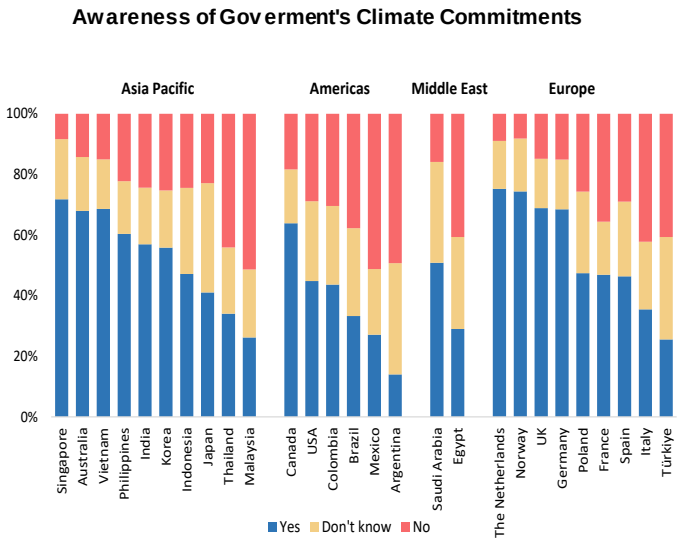
Figure 3. Climate Concern and Individual Characteristics



Source: IMF staff calculations based on IMF-YouGov survey.
Note: Ordinary least squares regression on *z*-scores of the dependent variable (seriousness of climate change) with country fixed effects are in panel 1 and analogous country-level regressions in panel 2. Panel 2 reports the range of coefficient estimates by country (country flags). In panel 1, the 95 percent confidence intervals are computed using standard errors clustered by country. Data labels in panel 2 use International Organization for Standardization (ISO) country codes.

[6] The statistically significant gender gap in climate risk perceptions is in line with existing research (for example, Xiao and McCright 2014). Various theoretical reasons for this gap have been posited, including differential risk preferences and value orientation (for example, altruism, social values), among others.

Awareness of government commitments and policies: Knowledge of climate mitigation policies and awareness of government's commitments to tackle climate change vary across regions and countries. The share of respondents expressing awareness of government's commitments to tackle climate change is, on average, higher in advanced economies, but there is important cross-country variation. In some emerging market countries where government's climate commitments in global forums have received extensive domestic media attention (for example, Colombia, Philippines, Vietnam), a higher share of respondents claim awareness of their government's climate actions. Even though a majority of countries surveyed have carbon pricing policies in place (Parry, Black, and Zhunussova 2022), fewer respondents express prior knowledge of a carbon tax or emissions trading (cap-and-trade) systems compared with other policies, such as laws and regulations to drive down the energy use of buildings, cars, and appliances and subsidies for low-carbon technology or renewable energy sources (Figure 4).



Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the distribution of responses in each country (in percentage points) to the question *"As far as you know, has your government made a commitment to take action to reduce climate change?"*

Figure 4. Prior Knowledge of Climate Mitigation Policies
(Percent of responses. Multiple answers possible)

	Asia Pacific	Australia	China	India	Indonesia	Japan	Malaysia	Philippines	Singapore	Korea	Thailand	Vietnam	Americas	Argentina	Brazil	Canada	Colombia	Mexico	USA	Middle East	Egypt	Saudi Arabia	Europe	France	Germany	Italy	The Netherlands	Norway	Poland	Spain	Türkiye	UK
Carbon tax		65	34	28	19	34	36	21	63	58	23	29		15	22	70	21	16	45		12	16		61	23	43	26	31	34	38	21	57
Cap-and-trade or emissions trading systems		45	43	26	21	20	27	27	33	40	30	31		16	34	42	22	18	40		13	17		25	25	16	21	41	44	33	24	36
Law and regulations limiting carbon emissions		70	75	61	68	63	70	70	74	71	58	71		48	63	71	64	61	69		43	50		64	64	65	72	62	63	70	57	76
Subsidizing renewable energy sources		76	71	62	55	63	70	66	70	59	67	69		56	61	70	62	64	69		68	66		65	71	74	67	63	76	75	75	79

Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the distribution of responses in each country to the question "*Which, if any, of the following ways of reducing climate change have you previously heard of? Please select all that apply*". Blue denotes higher values.

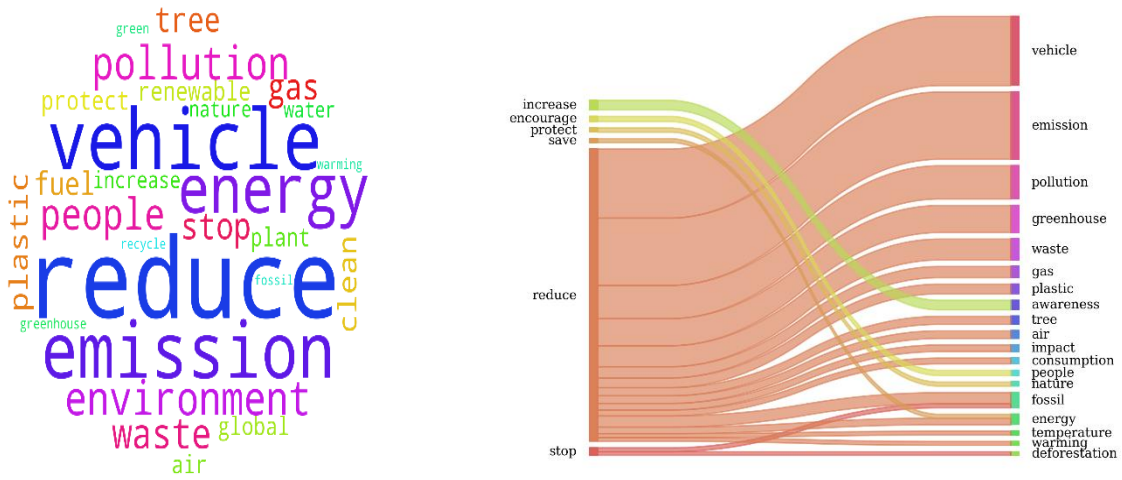
Attributes of Good Climate Policy

Text analysis: This section presents the findings from the analysis of the text of the open-ended question "*What do you think a good climate policy should aim to achieve?"* Figure 5 (panel 1) shows the most

common words across all responses (see Ferrario and Stancheva 2022 and Technical Appendix A2 for details), indicating that the words "reduce" and "emissions" are among the most frequently used. Similarly, the Sankey chart (Figure 5, panel 2) shows the most common combinations of words in which a verb is followed by a noun. As in the word cloud, respondents' first-order reactions center around reducing emissions, pollution, and the use of cars. We also find evidence that other environmental concerns, such as reducing plastic and waste and stopping deforestation appear frequently.

Figure 5. Goals of a Good Climate Policy

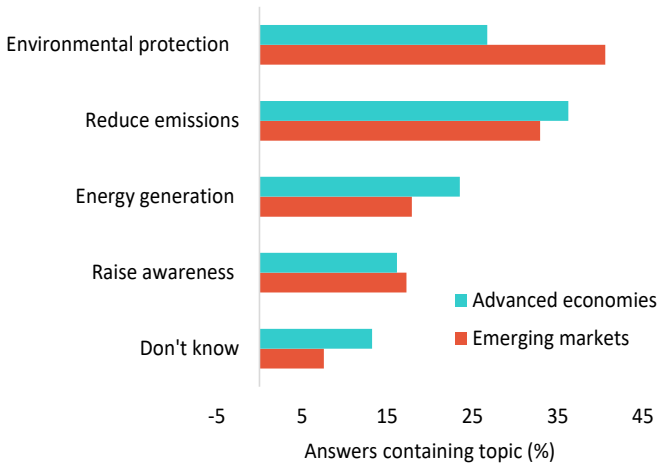
1. Word Cloud **2. Sankey Chart**



Source: IMF staff calculations based on IMF-YouGov survey.
Note: Word size and color in panel 1 are proportional to word frequency rank (color order: blue, red, green). Link size in panel 2 is proportional to combination frequency; each pair of words in the figure appears at least 50 times in the data.

Key topics: To better understand the ideas conveyed in respondents' concerns, we classify the most common words across all answers into four broad topics: environmental protection, reducing emissions, energy generation, and increasing awareness (see Technical Appendix A2 for details). The text figure shows the distribution of topics in responses by level of economic development of countries. Respondents from emerging market economies more frequently mention environmental protection, while those in advanced economies focus on emissions and the energy matrix. The greater use of alternative energy sources and the ongoing energy crisis in Europe also drive differences in first-order concerns across countries.

Classification of Responses into Topics



Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the share of answers that contain at least one word related to each of the four broad topics, plus the share of answers that relate that they do not know what a climate policy should do. Note that responses can be classified into more than one topic.

Another consideration that emerges from the text analysis is the importance of increasing awareness that

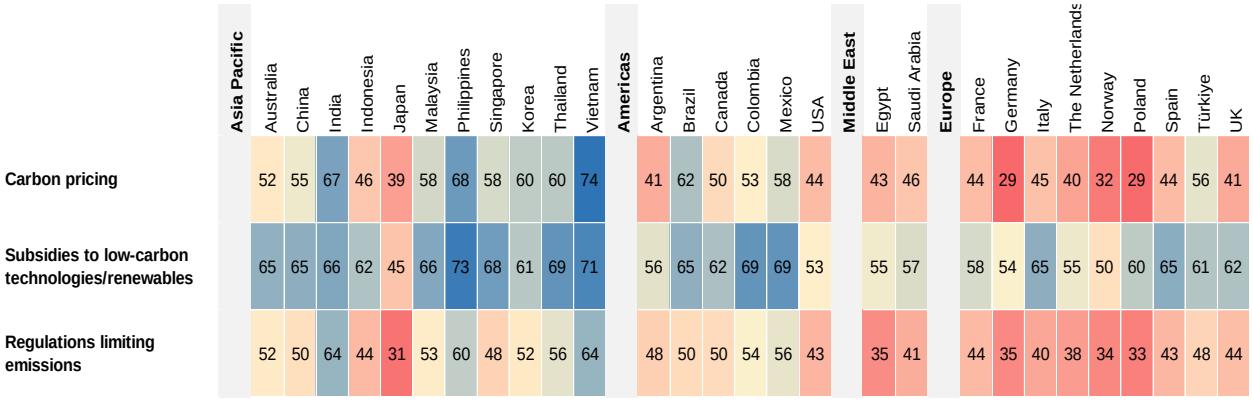
climate change is a real threat and persuading people to adapt their consumption accordingly. Interestingly, nearly 15 percent of respondents in advanced economies say that they have no opinion or do not know what a good climate policy should aim to achieve.

Support for Climate Action

Role of policy attributes and other characteristics in driving support: Existing research points to several attributes that shape policy support (Drews and van den Bergh 2016; Fairbrother 2022; Ziegler 2017; Carattini, Carvalho, and Fankhauser 2018). These include views on how effective and beneficial the policy is (both for society and personally), the costs associated with it, and perceptions of fairness (how outcomes are distributed across all involved parties). Individual beliefs and concerns about climate change, socioeconomic characteristics, and economic and political ideology can also shape policy support.[7] Drawing on this literature, we examine which beliefs and characteristics are correlated with support for the three main climate policies considered, as well as the role that information plays. Our analysis distinguishes between advanced and emerging market economies, but we note that country-specific context could affect the levels of support for climate policies.

Support for climate policies: Across countries, the baseline level of support for carbon mitigation policies is highest for subsidizing low-carbon technologies and renewable energy (Figure 6; see also Dechezleprêtre and others 2022). This is particularly evident in Europe, where high energy prices and their impact on the cost of living are hitting the public particularly hard at the moment. Across regions, support for the three policies is highest in Asia.

Figure 6. Support for Mitigation Policies
(Percent of favorable responses)



Source: IMF staff calculations based on IMF-YouGov survey.
Note: Each row in this figure shows the share of favorable responses in each country to the questions "*Thinking about all of the impacts of a carbon pricing policy, to what extent do you support or oppose such a policy in your country*?", "*Thinking about all the impacts of a subsidy to renewable energy, to what extent do you support or oppose this policy in your country*?", and "*Thinking about all of the impacts of regulation, to what extent do you support or oppose this policy in your country*?" respectively.

[7] Right-leaning orientation has been associated with lower support for publicly financed climate policies, particularly in the United States and United Kingdom (Ziegler 2017; Fairbrother 2022). Given the difficultly of capturing political orientation in many emerging market economies in our sample, we proxy these beliefs by views on the government's role in regulating the economy.

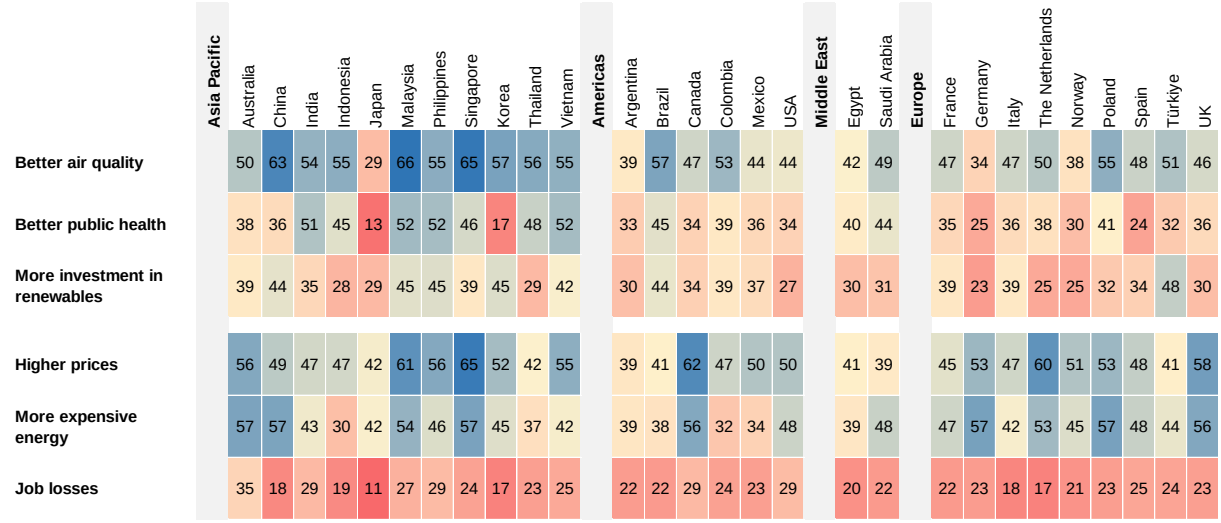
Zooming in on Carbon Pricing

Policy perceptions and beliefs about carbon pricing: Putting a price on carbon is central to effective climate policy, but many countries are reluctant to use this policy lever. Examining people's beliefs about policy attributes can help explain potential resistance to carbon pricing. Figure 7 summarizes how respondents think about the effects of carbon pricing in different countries.

- **Perceived co-benefits:** Environmental co-benefits such as reduced air pollution are universally acknowledged across countries. Asia stands out as the region with the highest share of respondents highlighting improved air quality as a key benefit. Perceived benefits in terms of improved health outcomes are higher in emerging markets compared with advanced economies and are particularly striking in India, Malaysia, the Philippines, and Vietnam.
- **Perceived costs:** In most countries, concerns about higher prices and more expensive energy resonate with respondents. Perceived costs and the negative impacts of carbon pricing are high in Europe, Canada, Malaysia, and Singapore. Across countries, 10 to 35 percent of respondents think that carbon pricing will result in widespread job losses.
- **Perceived equity effects:** A higher share of respondents in Europe (except for Türkiye), Canada, and Japan consider carbon pricing to be regressive compared with other countries. In The Netherlands and the United Kingdom, for instance, about 70 percent of respondents believe that low-income earners, the middle class, and small businesses would lose from carbon pricing. In emerging market countries such as Brazil, India, the Philippines, and Thailand, respondents are less likely to consider the distributional impacts of carbon pricing as regressive.[8]

Figure 7. Policy Perceptions and Beliefs about Carbon Pricing across Countries

1. Benefits and Costs (Percent of responses. Multiple answers possible)



[8] This finding is in line with the literature that argues that the impact of carbon taxes in emerging markets is slightly progressive (Datta 2010; Renner 2018; Dorband and others 2019).

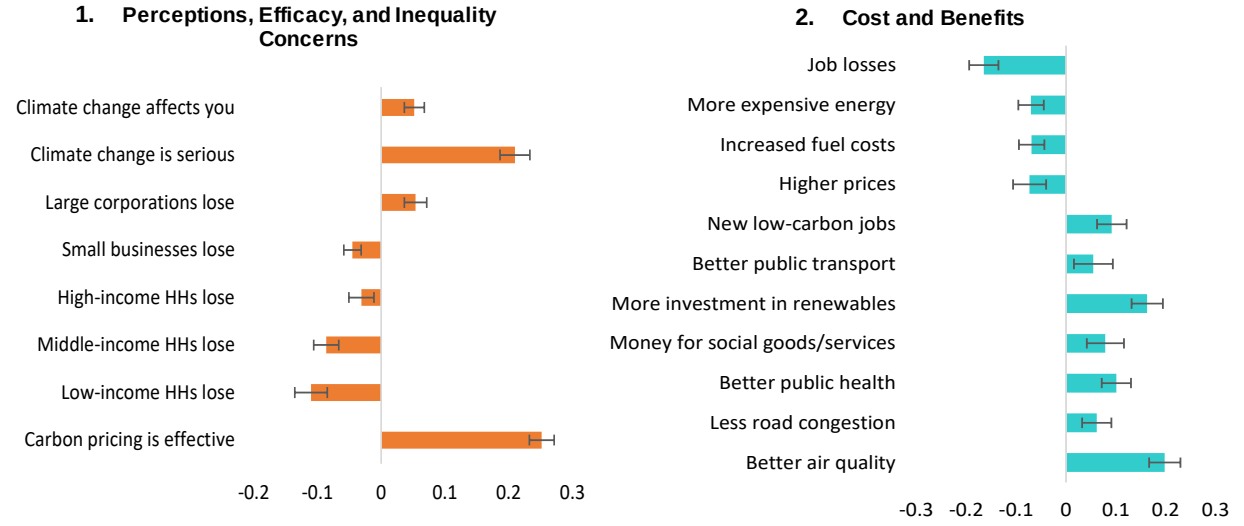
2. Distributional Implications (Percent of responses. Multiple answers possible)

	Asia Pacific	Australia	China	India	Indonesia	Japan	Malaysia	Philippines	Singapore	Korea	Thailand	Vietnam	Americas	Argentina	Brazil	Canada	Colombia	Mexico	USA	Middle East	Egypt	Saudi Arabia	Europe	France	Germany	Italy	The Netherlands	Norway	Poland	Spain	Türkiye	UK
Low-income HH lose		54	43	29	36	65	46	31	48	49	32	40		48	31	59	42	48	50		57	51		56	66	59	72	66	63	61	47	69
Middle-income HH lose		48	42	33	35	64	45	31	51	47	34	38		48	31	56	44	49	52		55	50		62	66	57	69	65	66	60	48	61
Small businesses lose		57	57	38	41	66	51	36	58	61	43	43		55	40	62	54	54	57		50	46		59	64	68	69	70	69	67	52	71

Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the distribution of responses in each country to a series of questions about the costs and benefits (top panel. Only the three most cited costs and benefits are reported), and distributional implications of carbon pricing (bottom panel). HH = households.

Empirical drivers of support for carbon pricing: Figure 8 shows the results of the empirical analysis for the entire sample of countries, where support for carbon pricing is regressed against a rich set of individual-level characteristics, beliefs, and country fixed effects (see also Technical Appendix A3, for country-specific results, and A4 for regression results). Strong climate change concern and the perception that carbon pricing is effective at reducing emissions are both important determinants of policy support. Distributional concerns weaken support, particularly if the policy is believed to impose higher burdens on low- and middle-income households. Views on the costs and benefits of carbon pricing policy are also correlated with overall level of support. Concerns about higher fuel costs are more strongly correlated with lack of support in Germany and the United States relative to other countries. Co-benefits such as enhanced air quality, investment in renewable energy, and improved health outcomes are associated with higher support for carbon pricing, while fears of job loss, increased energy and fuel prices, and higher cost of living are associated with lower support. Improved air quality is a significant driver of support in Brazil, Mexico, and Spain, while respondents in Australia, Japan, and Norway are more inclined to support carbon pricing since it can incentivize investment in renewable energy.

Figure 8. Drivers of Support for Carbon Pricing: Policy Attributes, Perceptions, and Belief



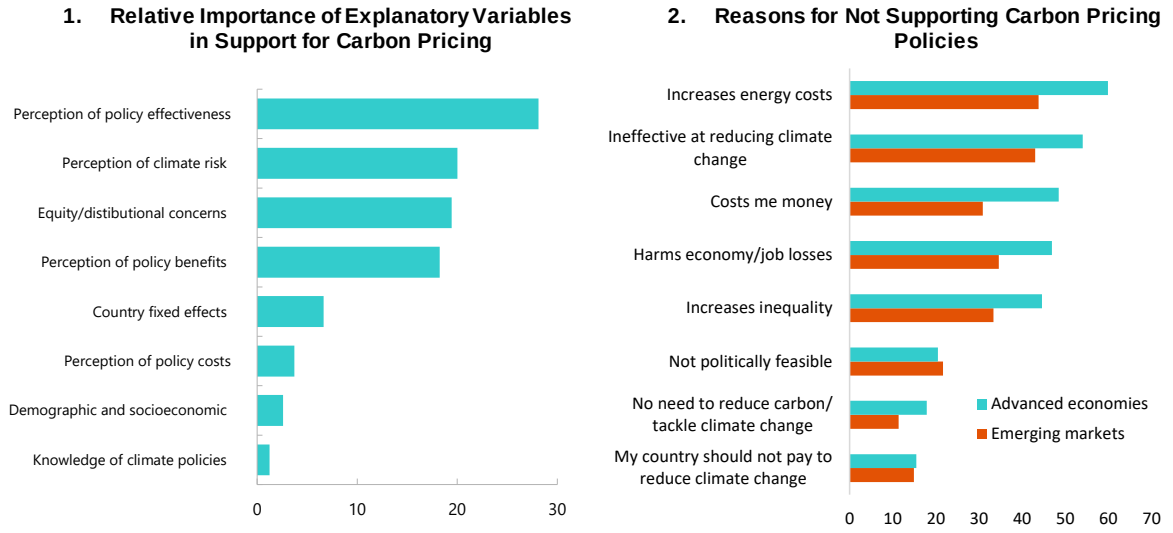
Source: IMF staff calculations based on IMF-YouGov survey.
Note: Ordinary least squares regression is on *z*-scores of the dependent variable (support for carbon pricing) with the full set of socioeconomic controls and country fixed effects. The 95 percent confidence intervals are computed using standard errors clustered by country. HH = household.

What perceptions and beliefs matter most? The most important factors in our data explaining the support for carbon pricing are perceptions of policy efficacy and concerns about climate change, with equity and fairness considerations and policy benefits close behind (Figure 9, panel 1). Beliefs in the effectiveness of carbon pricing in reducing emissions and perceptions of policy benefits together account for 45 percent of the variation in support. Across countries, equity and distributional concerns account for another 20 percent of the variation in policy views. To be supported, carbon pricing must therefore be seen as effective in reducing emissions, but not disproportionately increasing the burden on lower-income households.[9] Cost, affordability, and distributional concerns and beliefs about lack of policy effectiveness are, overall, the most frequently cited reasons for opposing carbon pricing (Figure 9, panel 2).[10] Concerns about economic and personal costs and perceptions of policy ineffectiveness are higher in advanced than in emerging market economies. Although statistically significant, socioeconomic and demographic characteristics explain only a small proportion (less than 5 percent) of the overall variation in policy views, despite cross-country variation in the relative importance of these characteristics (Technical Appendix Figure A3.2).

[9] The expectation that carbon taxes will not work is also one of the main reasons for their rejection by people in other surveys (Baranzini and Carattini 2017; Carattini and others 2017).

[10] Overall, our results across 28 countries confirm some of the patterns observed for specific countries, where the importance of perceived fairness, effectiveness, and self-interest has been highlighted. The results are also similar to the cross-country study by Dechezleprêtre and others (2022). However, in contrast to their study, we find that perceptions of policy costs explain a much smaller share of the variation in support for carbon pricing.

Figure 9. Drivers of Support for Carbon Pricing: Policy Attributes, Perceptions, and Belief



Source: IMF staff calculations based on IMF-YouGov survey.
Note: Panel 1 shows the results of a dominance analysis evaluating the share of variance explained by different sets of beliefs and perceptions in the ordinary least squares regression of the determinants of support for carbon pricing. Panel 2 shows the response rate (in percentage of respondents) to the question *"Why do you oppose a carbon pricing policy in your country?"* for the sample of respondents who oppose carbon pricing.

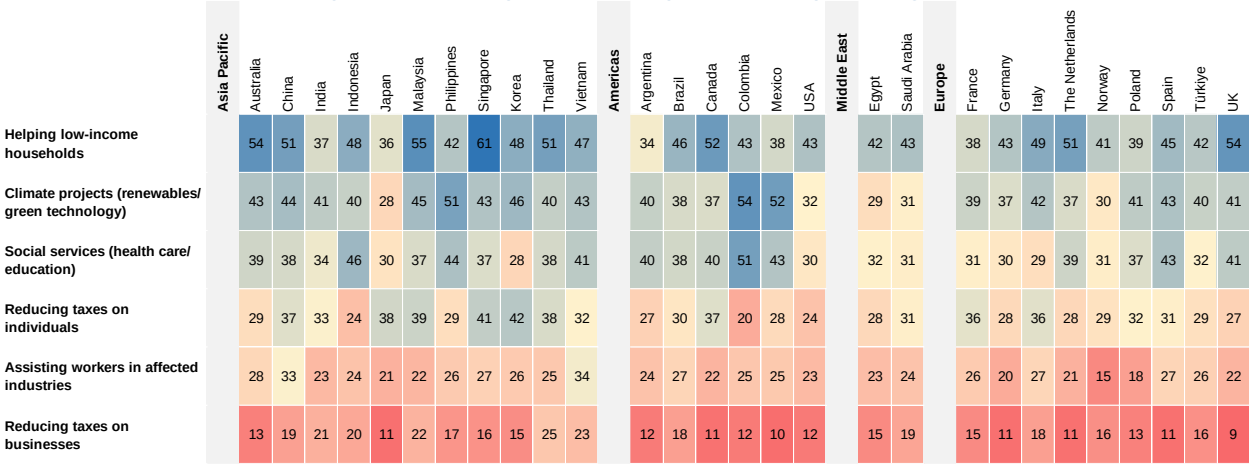
Revenue recycling to build support: Design features, such as the way revenues from carbon pricing are recycled, can help address regressive effects and cost-of-living concerns and obtain broad support. A majority of respondents think that revenues should be used to help harder-hit low-income households to increase social spending on health care and education, or be earmarked for low-carbon technologies and renewables (Figure 10).[11] Overall, people value revenue recycling efforts that impose a lighter burden on low-income households. However, we also find significant cross-country variation in support for different recycling efforts.[12] In Canada, Japan, South Korea, and Singapore, a large share of respondents also supports offsetting cuts to other taxes. About a third of respondents in Australia, China, the United States, and Vietnam support assisting workers in affected industries. Group differences within countries can also shape preferences for revenue recycling (Technical Appendix Figure A3.3).[13]

[11] The literature has broadly explored three revenue recycling strategies: the earmarking of revenues to support emission reduction projects, the redistribution of revenues to achieve a less fiscally regressive outcome, and the reduction of other taxes to achieve a revenue-neutral outcome (IMF 2019; Klenert and others 2018; Carattini, Carvalho, and Fankhauser 2018). Implementation details can also impact public support. For example, Bourgeois, Giraudet, and Quirion (2021) find that carbon taxes are best accepted if revenues are earmarked in a transparent way.

[12] This result is in line with Mildenberger and others (2022) who study public support for revenue recycling through lump-sum dividends in Canada and Switzerland, the only countries that have implemented such policies to date. They find low public awareness of the recycling policy and substantial heterogeneity in support levels across political views.

[13] For instance, wealthier and more educated individuals tend to favor using revenues from carbon pricing to fund renewable energy and low-carbon technologies compared with lower-income and less-educated individuals.

Figure 10. Revenue Recycling to Increase Support for Carbon Pricing
(Percent of responses. Multiple answers possible)



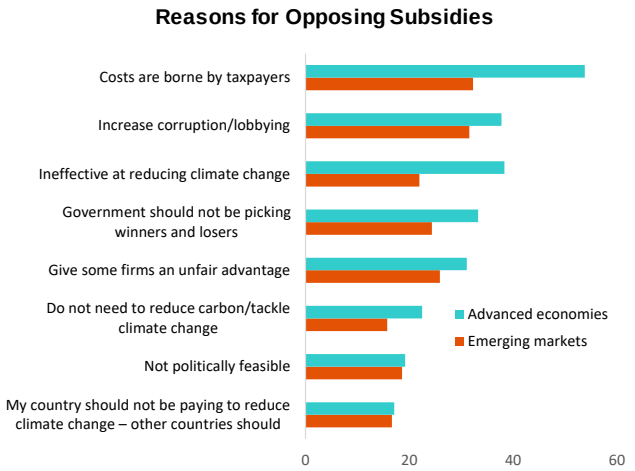
Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the distribution of responses in each country to the question "*A carbon pricing policy that charges companies for their emissions would also raise the amount of money the government is able to collect and spend. Which, if any, of the following would increase your support for the policy? Please select up to three.*"

Support for Other Policies

Support across policies: As shown in Figure 6, subsidies for low-carbon technologies and renewables are universally the most favored climate policy. For instance, in Europe and the United States, it is the only policy that is supported by over half the respondents.[14] One possible reason is that carbon pricing policies are more frequently associated with higher personal costs than other policy instruments (Carattini, Carvalho, and Fankhauser 2018), while regulations tend to be viewed as coercive, which decreases public support (Drews and van den Bergh 2016). Subsidies for green technologies and renewables might also receive high levels of support as technological advances are often seen as one of the most important tools for solving the climate crisis (UNFCCC 2022). Another crucial factor that plays in favor of subsidies is that, while their benefits are well understood, their costs in terms of higher taxes or lower spending elsewhere tend to be less salient (Fairbrother 2022).

[14] Dechezleprêtre and others (2022) find that subsidies for low-carbon technologies receive support from more than 55 percent of the sample in high-income countries and over 65 percent of the sample in middle-income countries.

Spending efficiency matters: Among respondents who do not support subsidies for low-carbon technologies and renewables, costs to taxpayers are the most frequently cited reason for opposition, followed by concerns about corruption and policy effectiveness. These results corroborate findings from previous studies that countries with higher perceived corruption are associated with weaker climate policies and higher greenhouse gas emissions after relevant political and economic factors are considered (Klenert and others 2018). This finding also suggests that trust in public institutions and government spending efficiency can help drive support for greening the economy.

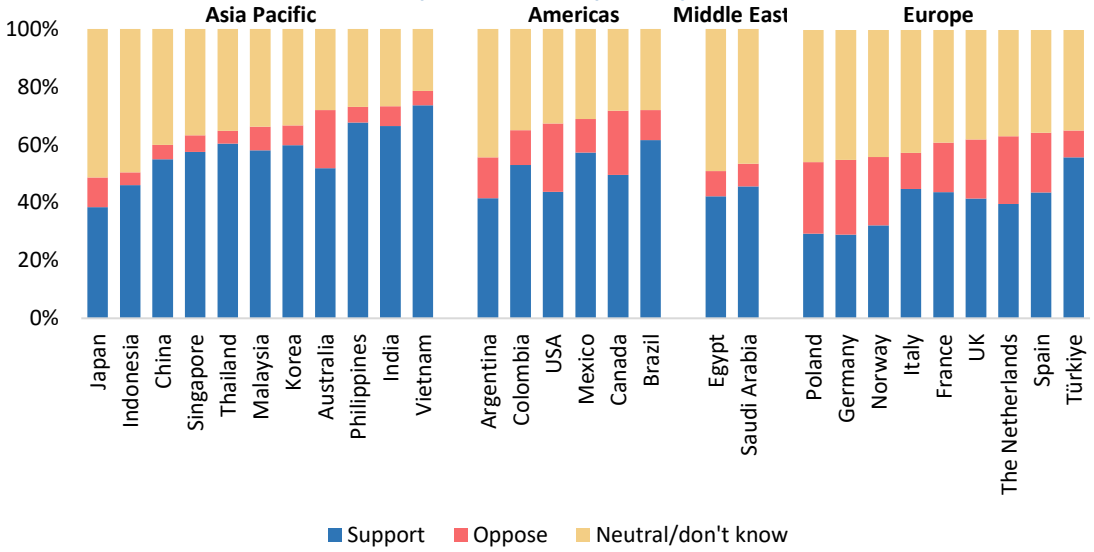


Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the distribution of responses (in percentage points) to the question *"Why do you oppose subsidies for renewable energy or low-carbon technology in your country? Please select all that apply."* Differences between advanced and emerging market economies are significant at 1 percent level.

Role of Information

Large information gaps: Knowledge and understanding of climate policies can shape support for mitigation policies. However, there is still a sizable information gap to be filled in most countries. For example, fewer than 20 percent of respondents in Indonesia say that they know what a carbon tax is (Figure 4), even though one was slated for implementation in early 2022. Similarly, people may not believe carbon pricing can reduce emissions through changes in behavior toward cleaner alternatives or that such a policy can be progressive. There is also a sizable share of respondents in many countries with no clear opinions about climate mitigation policies. For example, about half of the respondents in Egypt, Indonesia, and Japan neither supported nor opposed a carbon pricing policy (Figure 11).

Figure 11. Support for Carbon Pricing
(Percent of responses)

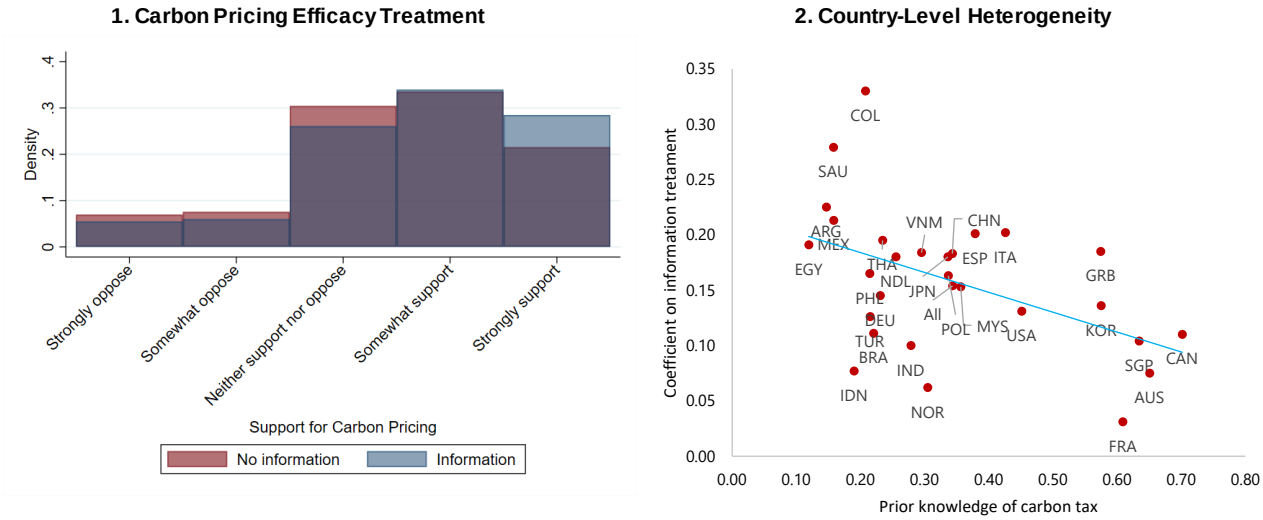


Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the distribution of responses in each country to the question "*Thinking about all the impacts of a carbon pricing policy, to what extent do you support or oppose such a policy in your country*?"

Information alters support: To address the impact of information on policy support, we randomly provide half of respondents with a piece of information about the effectiveness of carbon pricing and the benefits of revenue recycling. We find that providing information about the effectiveness of carbon pricing policies does increase public support (Figure 12, panel 1). The shift in the distribution indicates that the people who change their minds are likely to have held neutral or negative views of the policy in the absence of this information. We also find substantial heterogeneity in the impact of the information intervention across countries. In particular, the impact of the information treatment in enhancing support for carbon pricing is higher in countries where there is little preexisting knowledge of carbon taxes as a carbon policy instrument (Figure 12, panel 2).

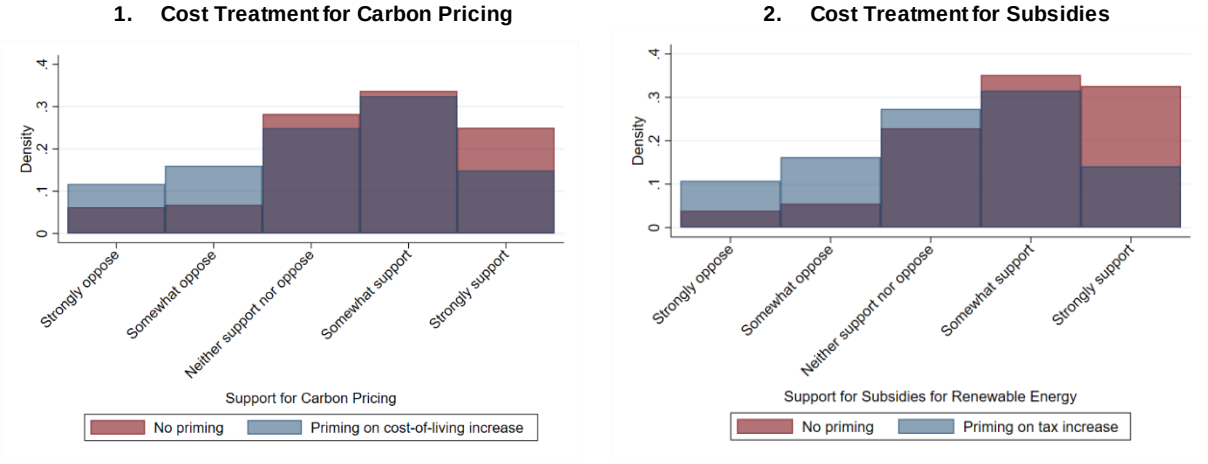
Cost treatments: The surveys also allow us to test how support for mitigation policies changes when people are made aware of the potential implications for them personally via financial trade-offs in terms of increased prices or taxes. Support for carbon pricing and subsidies for low-carbon technologies and renewables typically falls when respondents are presented with cost implications (Figure 13). When the cost of subsidies is made salient by telling respondents that subsidies could result in an increase in their taxes or a decrease in other government expenditures, the distribution shifts from "strongly support" to "oppose" (Figure 13, panel 2).

Figure 12. Carbon Pricing Efficacy Information Treatment



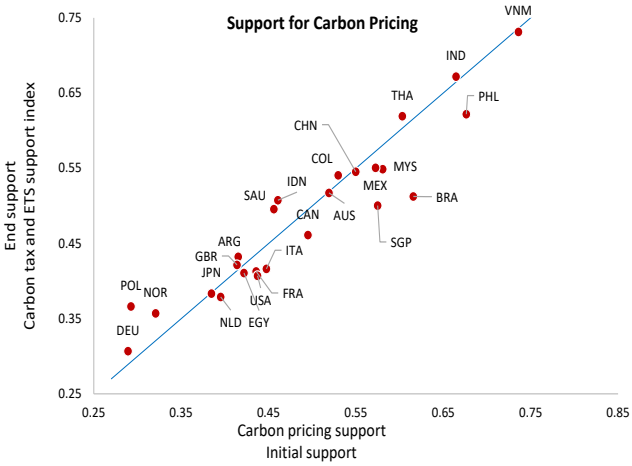
Source: IMF staff calculations based on IMF-YouGov survey.
Note: Panel 1 shows the shift in the frequency distribution from a randomized treatment in which a random sample is told that carbon pricing provides correct incentives to decarbonize and can encourage innovation and that revenues can be recycled. The effect of the information treatment is statistically significant (see technical appendix). Panel 2 shows a country-level plot of respondents' prior knowledge of carbon pricing (*x*-axis) and the size of the treatment effect from information provision. Data labels in panel 2 use International Organization for Standardization (ISO) country codes.

Figure 13. Providing Information on Cost Implication of Carbon Pricing and Subsidies



Source: IMF staff calculations based on IMF-YouGov survey.
Note: The panels show the shift in the frequency distribution as a result of additional information on how the policy works. Carbon pricing treatment informs respondents that the policy reduces greenhouse gases but also increases the cost of living. The sub sidy treatment informs respondents that the subsidy for low-carbon technologies and renewables must be paid for with an increase in taxes (or decrease in other government spending).

Support for policies can be fragile. Compared with initial views, support for carbon pricing shifts in most countries once respondents are made aware of the overall costs and benefits of the policy. This is particularly true in the case of some emerging market economies where baseline knowledge of such policies can be low. For example, while 62 and 56 percent of respondents in Brazil and Türkiye, respectively, initially support carbon pricing, this share falls to 51 and 48 percent once respondents are made aware of the policy impacts. However, support can also increase as respondents become more informed, as is the case in Indonesia and Poland.



Source: IMF staff calculations based on IMF-YouGov survey.
Note: ETS = emissions trading system.

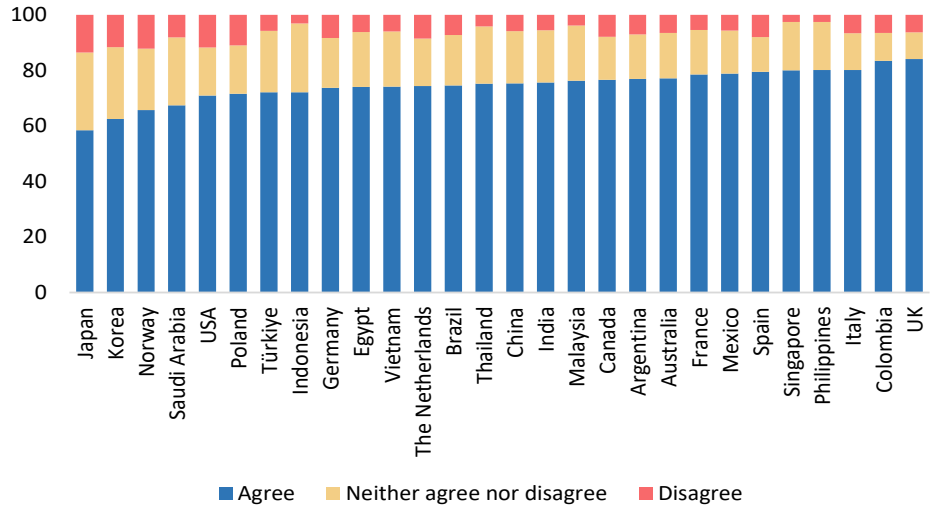
International Political Economy

Multilateralism and support for costly policies: Climate change mitigation is a global public good requiring international cooperation, and these global efforts need broad public support (Ostrom 2009). Here we explore how two key dimensions of global climate cooperation—distribution of costs and participation—potentially affect individuals' willingness to support international efforts.

Support for collective action: A vast majority of respondents think that climate change policy will be effective only if most countries adopt measures to reduce carbon emissions, ranging from close to 60 percent in Japan to 80 percent in the United Kingdom (Figure 14). People might be more willing to adopt costly policies if other countries do so, both because the efforts of other countries make it more likely that policies will be effective and because those efforts resonate on fairness grounds (Bechtel, Genovese, and Scheve 2019; Bechtel, Scheve, and van Lieshout 2021).[15]

[15] Some recent studies, however, find that people prefer unilateral actions, suggesting that public support for costly climate policies may not meaningfully depend on whether or not other countries are also contributing (Mildenberger 2019; Beiser-McGrath and Bernauer 2019).

Figure 14. Multilateralism and Effectiveness of Climate Policies
(Percent of responses)



Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the distribution of responses in each country to the statement "*Climate change policy will only be effective if most countries adopt measures to reduce carbon emissions.*"

Perceptions of who should pay: Disagreement over the distribution of mitigation costs across countries is an obstacle to international agreements. Governments frequently invoke principles of distributive justice in negotiations and public debate to justify their position on burden sharing—a stance that is typically aligned with their countries' economic interest. Two broad considerations typically invoked are the "polluter pays" principle ("proportional to current emissions" and "proportional to the history of emissions") and the "ability-to-pay" principle ("only rich countries pay"). Interestingly, most respondents in both advanced and emerging market economies think that all countries, not only rich ones, should pay to address climate change (Figure 15). Further, a large share of respondents in most countries (except China and Saudi Arabia) think that burden sharing should be based on current rather than historical emissions, with the difference in views being more pronounced in advanced economies.[16] This suggests that the common ground for crafting future agreements is larger than expected. However, there remains scope for engendering even greater policy support in emerging market economies if policies are differentiated based on level of development and past emissions.[17]

[16] A 2015 Pew survey conducted across 40 advanced, emerging market, and developing economies similarly found that 42 percent of respondents in emerging market and developing economies supported the notion that developing economies should do as much as rich countries to combat climate change since they will produce most of the world's future emissions (see Dabla-Norris and others, forthcoming[a]).

[17] This result is similar to a study by Schleich and others (2016) that examines citizens' perceptions of distributive justice using surveys from China, Germany, and the United States.

Figure 15. International Burden Sharing: Who Should Pay?
(Percent of responses)

	Asia Pacific	Australia	China	India	Indonesia	Japan	Malaysia	Philippines	Singapore	Korea	Thailand	Vietnam	Americas	Argentina	Brazil	Canada	Colombia	Mexico	USA	Middle East	Egypt	Saudi Arabia	Europe	France	Germany	Italy	The Netherlands	Norway	Poland	Spain	Türkiye	UK
Only rich countries		16	21	28	16	19	25	22	14	16	23	23		24	23	16	21	23	14		28	28		27	13	14	13	19	21	24	27	14
All countries		69	68	59	73	48	66	69	73	74	61	70		57	65	65	68	71	63		51	51		58	69	73	70	57	56	64	55	70
Don't know		15	12	12	11	33	8	8	13	10	16	7		20	12	19	10	6	23		22	22		15	18	13	18	24	24	12	18	16
Current emissions		51	40	50	47	35	50	48	50	47	47	52		41	43	50	48	54	44		37	36		49	48	49	53	45	55	48	41	51
Past emissions		28	44	35	35	26	38	41	32	38	35	37		33	41	27	37	38	26		35	37		35	20	31	16	18	16	33	37	26
Don't know		22	16	15	18	38	12	11	18	15	18	10		26	16	23	16	8	30		28	26		16	32	19	31	36	29	19	22	23

Source: IMF staff calculations based on IMF-YouGov survey.
Note: This figure shows the share of responses (in percentage points) to the questions "*Which countries do you think should be paying to reduce carbon emissions?*" (top panel) and "*Should countries be paying to reduce carbon emissions based on their current or accumulated historic levels of emissions?*" (bottom panel).

Conclusions and Policy Implications

Understanding public perceptions of climate mitigation policies: Achieving net zero emissions globally will require a variety of policy interventions, including policies that put a price on carbon, subsidies to support the breakthrough of low-carbon technologies and renewable energy, and regulatory standards to drive down the energy use of buildings, cars, and appliances. Our international surveys conducted across 28 advanced and emerging market economies show that there is significant heterogeneity across individuals and countries in how climate change is perceived and in how preferences for public intervention are defined. From a public acceptability perspective, public perceptions can hinder the adoption of otherwise desirable climate mitigation policies. Tackling climate change requires ensuring that climate actions receive broad public support. Understanding public perceptions is a first step in this direction.

The devil is in the design. Carbon pricing policies can be made more acceptable by designing them in a way that responds to citizen concerns. Our analysis shows that in addition to policy costs, perceived effectiveness, fairness, and co-benefits influence public support for carbon pricing. How revenues from carbon pricing are spent also critically shapes support. The most appropriate use of the revenues will be contextual as preferences for revenue recycling vary both across and within countries. Transfers could benefit poor households and those made worse-off, as could making cleaner energy alternatives more widely available and affordable. Having a large gap in infrastructure financing could justify using revenues for investment in green infrastructure. Using tax revenues for additional emissions reduction could also reassure citizens that the carbon pricing instrument is effective and that environmental objectives will be met (Baranzini and Carattini 2017).

Addressing distributional concerns: The perception that a climate policy is regressive or that it leads to potential job losses can undermine public support for it. As such, climate policies should be designed to

be affordable and perceived as fair to everyone. Carbon pricing, in particular carbon taxation, can receive higher support in many countries if revenues are recycled to lower-income households. Cash transfers can help protect the most vulnerable and make it easier for households to shift toward lower carbon consumption. Universal transfers or reductions in taxes, such as labor taxes, coupled with targeted cash transfers for low- and middle-income households, could also have a role to play in alleviating inequality and garnering broader public support in the short term (Shang 2021; IMF 2019). Active labor market policies that promote greener jobs and ease the transition for workers can minimize potential job losses while also boosting skills and incomes for the lowest-paid workers and reducing inequality (IMF 2022). Recycling part of the tax receipts from carbon pricing into subsidies for investment in low-carbon technologies (renewables, electric vehicles)—a policy that receives broad-based support across our sample of countries—could also make cleaner energy alternatives more widely available.

Need for complementary policies: An integrated government strategy is needed to secure public support and combat climate change. Bolstering social safety nets and active labor market policies can help address distributional concerns. Achieving net zero greenhouse gas emissions globally will also require new technologies and large investments in carbon-smart infrastructure and clean energy. Public support for such policies tends to be high across countries, but concerns about corruption and policy ineffectiveness dominate, suggesting that government spending efficiency matters. Green public financial management systems and improvements in public investment institutions and processes to build low-carbon infrastructure can ensure that countries manage their budgets and public investment efficiently and effectively.

Communicating the effectiveness and co-benefits of climate policies: Communicating information to the public about how policies work and their effectiveness in reducing emissions is important. This is particularly true for policies for which support tends to be low or when a large share of the public is unaware of policy impacts, such as in the case of carbon pricing.[18] Our analysis has highlighted that the public is sensitive to the potential negative implications of climate policies. However, we also find that communicating co-benefits can help build support, pointing to the importance of improving awareness on how policies can reduce air pollution and lead to improved health outcomes—first-order concerns in many emerging market economies—and create new low-carbon jobs. Increasing awareness about the effectiveness of mitigation policies in reaching net zero emissions and providing more information on how revenues from carbon pricing are spent could lead to win-win solutions.[19]

Raising climate change and policy awareness: Knowledge about climate mitigation policies remains far from universal, and many people still have no opinion when it comes to supporting or opposing climate policy actions in their country. To support climate transitions, there is an urgent need to close the still-

[18] The IMF's Climate Change Indicators Dashboard supports the priorities of improving public awareness of climate change concerns and providing necessary information to policymakers.

[19] Clements and others (2013) and Coady, Parry, and Shang (2018) identify key ingredients for successful energy reforms, including extensive communications programs, clear use of revenues, and robust assistance for vulnerable groups.

large information gaps and raise awareness of the societal transformations and behavioral changes needed, the cost of inaction, and the impact of climate policies.

Securing multilateral support for climate action: We find widespread support for international cooperation, with sizable shares of respondents even in emerging market countries favoring global climate actions with burden sharing based on current (rather than historic) emissions. The public is likely to be more supportive of adopting costly climate policies if other countries do so, both because this increases the odds of reaching global net zero emissions goals and because those efforts resonate with widely held fairness norms. Securing cooperation among a small number of the largest emitters could catalyze the needed global action and pave the way for other countries to follow suit.[20]

[20] One option is an international carbon price floor that could jump-start emissions reductions through substantive policy action (Parry, Black, and Roaf 2021).

Annex 1. List of Countries

No.	Country	Observations
Asia Pacific		
1	Australia	1,009
2	China	1,016
3	India	1,018
4	Indonesia	1,052
5	Japan	1,002
6	Malaysia	1,013
7	Philippines	1,058
8	Singapore	1,017
9	Korea	1,108
10	Thailand	1,009
11	Vietnam	964
Americas		
12	Argentina	1,055
13	Brazil	1,005
14	Canada	1,004
15	Colombia	1,043
16	Mexico	1,019
17	USA	1,017
Middle East		
18	Egypt	1,013
19	Saudi Arabia	1,013
Europe		
20	France	1,010
21	Germany	1,014
22	Italy	1,014
23	The Netherlands	1,019
24	Norway	1,017
25	Poland	1,002
26	Spain	1,007
27	Türkiye	1,017
28	UK	1,006
Total		**28,541**

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PUBLICATIONS

Public Perceptions of Climate Mitigation Policies: Evidence from Cross-Country Surveys

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