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Sustainable Procurement: Building Vocabulary To Accelerate The Federal Procurement Conversation

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Sustainable Procurement: Building Vocabulary To Accelerate The Federal Procurement Conversation

By Steven L. Schooner and Evan Matsuda*

Human-induced climate change is already affecting many weather and climate extremes in every region across the globe . . . [and w]ith every additional increment of global warming, changes in extremes continue to become larger.¹

We cannot ignore climate change or the accelerating climate crisis. The August 2021 report of the **United Nations Intergovernmental Panel on Climate Change (IPCC)**,² *Climate Change 2021: The Physical Science Basis*,³ reminds us that the increasingly frequent and devastating climate events featuring in the news⁴ leave little doubt that climate change is upon us.⁵ Since 2010, there have been 153 separate billion-dollar weather and climate disaster events in the United States alone,⁶ approximately five times as many as occurred (32) between 1980 and 1990.⁷ Nor are the effects of climate change going away any time soon; indeed, they will only get worse, as the IPCC warns: “Many changes due to past and future greenhouse gas emissions are irreversible for centuries to millennia, especially changes in the ocean, ice sheets and global sea level.”⁸

Immediately after the 2021 inauguration, the Biden Administration affirmatively recognized the severity of climate change and highlighted the key role the Federal Government must play in mitigating and adapting to its effects. The United States promptly rejoined the *Paris Climate Agreement*⁹ and the President signed two climate-related **executive orders (EOs)**.¹⁰ Soon thereafter, additional EOs established a Climate Change Support Office,¹¹ addressed climate-related financial risk,¹² and prioritized low- and zero-emissions vehicles.¹³ In the face of an immense climate crisis that can easily overwhelm individual effort and motivation, the importance of this type of strong commitment from the top cannot be overstated.¹⁴

The federal procurement process features prominently in the Government’s

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plan to slow the pace of, and adapt to the effects of, climate change.¹⁵ Importantly for procurement officials and companies selling to the Government, **EO 14008, *Tackling the Climate Crisis at Home and Abroad***, in sections 204–211,¹⁶ calls for, among other mandates, “aligning the management of Federal procurement and real property, public lands and waters, and financial programs to support robust climate action,”¹⁷ as well as “developing a comprehensive plan to create good jobs and stimulate clean energy industries by revitalizing the Federal Government’s sustainability efforts.”¹⁸

Strong messaging from senior leadership is important, but what does all of this mean at ground level? How do Government purchasers meaningfully implement this shift in policy and priorities? What do procurement professionals, contract specialists, prospective contractors, and others in the acquisition community need to know and do as these policies evolve?

This BRIEFING PAPER attempts to provide some basic building blocks to help answer these questions by offering a list of key sustainable procurement vocabulary and introducing a number of key concepts so that the acquisition community can build a common **body of knowledge (BOK)**¹⁹ with which to progress up the learning curve of sustainable procurement implementation. This PAPER also provides a number of existing tools and resources to help translate those concepts into practice. With regard to this latter function, it is important to remember that the Federal Government neither needs to, nor does it have time to, reinvent the wheel: much has been done—both within the Government and throughout the private sector—that can and should inform early implementation efforts.

Neither the modest vocabulary list nor the compilation of tools and resources collected here are intended to be

exhaustive. Moreover, one size won’t fit all in the complex world of public procurement, particularly given the disparities between various markets and sectors. But the more you talk about the topics introduced here, and the more you bring them into the workplace each day and contemplate how you might apply them to your work, the quicker the acquisition community will progress down the path of sustainable procurement implementation.

Key Vocabulary & Concepts

Sustainable Procurement

Sustainability, as defined by the International Organization for Standardization (ISO), describes a state of the global system in which “the needs of the present are met without compromising the ability of future generations to meet their own needs.”²⁰ Environmental, social, and economic considerations interact to create the three key dimensions of sustainability.²¹ **Sustainable procurement** in turn prioritizes the purchase of products and services that have “the most positive environmental, social, and economic impacts possible over the entire life cycle.”²² In other words, sustainable procurement considers the long-term effects of Government acquisitions, including impacts beyond the procuring agency and end user; incorporates that perspective into purchasing decisions, entails “adopting social, economic and environmental factors alongside the typical price and quality considerations . . . [in] procurement processes and procedures,”²³ and builds healthy communities, economies, and environments all along local and global supply chains. While this BRIEFING PAPER focuses primarily on the environmental aspect of sustainability, social, economic, and environmental considerations are all inextricably linked to acquisitions by Government agencies and the firms that sell to them.

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The U.S. Government spent more than \$660 billion in federal procurement contracts in fiscal year 2020.²⁴ This immense purchasing power creates two interrelated pathways for leveraging sustainable procurement to mitigate climate change: the Federal Government can (1) buy environmentally preferable goods and services that have less negative impact on the planet than their alternatives and (2) shape markets and spur innovation by signaling the intention to buy those environmentally preferable goods and services.

The Biden Administration's recognition of the potential to leverage the Federal Government's purchasing power to address climate change²⁵ aligns the United States with consensus throughout the broader international community.²⁶ In 2015, all United Nations (UN) member states adopted 17 **Sustainable Development Goals (SDGs)** as part of the 2030 Agenda for Sustainable Development.²⁷ Goal 12, which promotes sustainable consumption and production, specifically calls upon public procurement to play a role in sustainable development.²⁸ The UN Environment Programme (UNEP) actively collects data for an index intended to measure the level of sustainable procurement implementation in individual countries around the world.²⁹

Despite the increased emphasis on, and attention being paid to, sustainability at the federal level, sustainable procurement is neither new nor necessarily novel. The Environmental Protection Agency's (EPA's) **Environmentally Preferable Purchasing (EPP)** program, which assists Federal Government purchasers in identifying and procuring environmentally preferable products and services,³⁰ dates back to a 1993 EO on Federal Acquisition, Recycling and Waste Prevention.³¹ The EPA has implemented and improved the EPP program for nearly three decades to harness the potential of the Federal Government's spending power to "reduc[e] climate impacts, improv[e] the health of frontline communities, prevent[] pollution, and increas[e] U.S. industry competitiveness."³²

Nor is sustainable procurement new to the *Federal Acquisition Regulation (FAR)*. For example, discussion of environmental and energy conservation objectives, assessments, and requirements has long been (at least potentially) a component of written acquisition plans:

Environmental and energy conservation objectives. Discuss all applicable environmental and energy conservation objectives associated with the acquisition (see [FAR] part

23), the applicability of an environmental assessment or environmental impact statement (see 40 CFR part 1502), the proposed resolution of environmental issues, and any environmentally-related requirements to be included in solicitations and contracts.³³

Additionally, prior to the 1997 FAR Part 15 rewrite,³⁴ FAR 15.605(b)(1)(iv) *required* that "[e]nvironmental objectives, such as promoting waste reduction, source reduction, energy efficiency, and maximum practicable recovered material content . . . be considered in every source selection, when appropriate."³⁵ Alas, today the current iteration of that guidance, FAR 15.304, makes no mention of environmental objectives as a mandatory, or even a recommended, **evaluation factor** in negotiated contracts.³⁶

More broadly, FAR Part 23 is dedicated to the implementation of Federal Government policy regarding the environment, energy and water efficiency, and renewable energy technologies.³⁷ However, for a host of frustrating reasons, the EOs currently referenced in FAR Part 23 as underlying authority are long out of date.³⁸ FAR Subpart 23.1, for example, draws its sustainable acquisition policy directives from previously revoked EOs signed in 2007 and 2009.³⁹ FAR Cases 2021-015 and 2021-016 have been opened to update the FAR to reflect the May 20, 2021 EO 14030, *Climate-Related Financial Risk*,⁴⁰ but, at the time this BRIEFING PAPER is being prepared for publication, there is no timetable for these updates,⁴¹ and neither pending FAR Case currently references President Biden's other climate-related EOs.⁴²

Consistent with its treatment in the FAR, practical experience demonstrates that, at the federal level, sustainable procurement often remains on the back burner. The "tyranny of low prices," discussed at greater length below, further impedes progress to the extent that environmentally preferable purchases often require higher up-front costs.⁴³ Accordingly, suppliers and purchasers face significant hurdles in prioritizing the sustainable procurement principles highlighted by the Biden Administration, recognized in the UN SDGs, championed by the EPP program, and reflected in past and present iterations of the FAR. All signs suggest that our legal frameworks—from legislation to FAR cases—will increasingly incorporate sustainable procurement policy directives, but that timeline is unknown and fraught; shifting Government priorities towards longer-term sustainability considerations will take time. Against that backdrop, if the acquisition community plans

to play a role in stemming the relentless progression of climate change, we need to get started—individually and institutionally—now.

Naming The Imperative: The Anthropocene

It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.⁴⁴

We concede that most contract specialists don't need to be able to spell, let alone use, the word **Anthropocene**, but it appears frequently, albeit in scientific and academic discourse, as a commonly understood description of our current situation. Two decades ago, Nobel Prize-winning meteorologist and atmospheric chemist Paul Crutzen notoriously stood up from the audience during a presentation at a scientific conference to proclaim that we should be talking about the current geologic epoch as the "Anthropocene,"⁴⁵ not the Holocene.⁴⁶ With the acceleration of industrialization in the 1800s, humans have become the dominant major driver of change to the planet's climate and ecosystems such that our actions affect the planet on a geologic scale.⁴⁷ Scientists have proposed a new epoch defined by our impact on planetwide systems, using the term "Anthropocene," which combines the Greek words *anthropo*, meaning "man," and *cene*, meaning "new."⁴⁸

Meanwhile, outside the science world, "[t]he knowledge that human activity now rivals geological forces in influencing the trajectory of the Earth System has important implications for both Earth System science *and societal decision making*."⁴⁹ Our actions have proved capable of creating a distinct geologic stratum. Our actions moving forward are capable of equally impressive consequences—and they don't have to be negative consequences—but we need to act deliberately in our efforts to mitigate climate change.

Climate Leadership & Organizational Commitment

Even if we recognize our capacity to impact climate change in a positive manner, slowing the pace of climate change is a daunting task. (It's painful to concede this, but there is no credible scenario in which we can affirmatively *reverse* the trend in our lifetimes.⁵⁰) Moreover, the scale of the undertaking means that individual action, while helpful and often personally satisfying, is unreliable and, quite

frankly, grossly inadequate. Government (and, frankly, corporate,) leadership is required. As public response to the COVID-19 pandemic has demonstrated, when faced with a global crisis, people readily shy away from personal inconveniences regardless of their broad societal benefits.⁵¹ The climate crisis is also simply too vast for individual action to take us as far as we need to go.⁵²

The acquisition community therefore needs **commitment** from top management in organizational hierarchies: "Without this formal commitment, individuals involved in procurement have no official mandate to integrate sustainability into their procurement strategies or processes."⁵³ That commitment needs to extend to mid-level officials and managers. President Biden's commitment to sustainable procurement is necessary and sends the right message, but it will not trickle down to, or change the behavior of, contracting officers (COs) without organizational commitment throughout purchasing agencies and companies selling to the Government.⁵⁴

To make use of commitment from management, organizations need to **prioritize** sustainability issues based on **relevance** (how much a particular sustainability issue *applies to* the organization) and **significance** (how much a particular sustainability issue is *impacted by* the organization).⁵⁵ Especially in the early days of sustainable procurement implementation, bang-for-your-buck will be critical for maintaining momentum, highlighting successes, and efficiently utilizing limited political (and financial) capital.

History reminds that **change management** has proven a daunting hurdle to many acquisition reforms. As BRIEFING PAPER readers know, risk aversion long has permeated our profession. Accordingly, success likely will depend upon the existence of strong leadership, clear messaging, strong incentives to embrace new strategies, powerful disincentives to continue doing business as usual, convenient tools for COs to deploy, and, of course, positive reinforcement. The challenges ahead are all the more daunting because some aspects of sustainable procurement—such as favoring contractual solutions that reduce greenhouse gases—are not only complex, but unlikely to be implemented by a simple mandate inserted into the FAR or introduction of a new solicitation provision or contracting clause or creation of a standard (or optional) form.

Greenhouse Gas Accounting

Put simply, “carbon dioxide emissions are the primary driver of global climate change.”⁵⁶ Since the industrial revolution in the mid-1800s, human activity has increased the concentration of **carbon dioxide** in Earth’s atmosphere nearly 50%.⁵⁷ The primary anthropogenic source of that atmospheric carbon dioxide is the burning of fossil fuels for transportation and energy, which together make up more than 65% of carbon emissions in the United States.⁵⁸ The atmospheric presence of other **greenhouse gases (GHGs)**, namely methane, nitrous oxide, and a variety of fluorinated gases, also contribute to the greenhouse effect, but carbon dioxide makes up 80% of U.S. GHG emissions.⁵⁹

If the goal is to mitigate the worst impacts of climate change, you must play your part in reducing GHG emissions, focusing particularly on carbon dioxide emissions.⁶⁰ But to do so, you need to know how much GHG you (or your business partners) generate. As the saying goes, “**what gets measured gets managed**”;⁶¹ if you want to manage your climate impact, you need to adopt or develop *metrics* that provide you with useful and reliable data. Accordingly, the Government needs to more aggressively track Government-wide and agency-level progress towards achieving sustainability goals,⁶² widely share this information, and utilize the data to address weaknesses and expand upon successes.

Measuring GHG emissions, a process often referred to as **GHG accounting**, therefore plays a central role for purchasers and sellers alike in implementing sustainable procurement. A variety of tools have been developed for measuring GHG emissions,⁶³ with the most widely used measurement standards developed by Greenhouse Gas Protocol⁶⁴ as a joint initiative of the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) in the late 1990s.⁶⁵

Keep in mind that GHG accounting is scalable in terms of complexity. Agencies or firms that have never attempted to measure their emissions should not shy away from the task because of the potential complexity of the most in-depth emissions considerations; even the most straightforward GHG accounting is better than no data at all. To that end, Greenhouse Gas Protocol defines and differentiates between three levels of emissions for measurement:

- **Scope 1 emissions**—These encompass all direct

emissions generated by your institution itself, such as emission from company-owned facilities and vehicles.⁶⁶ When your institution’s trucks burn gasoline or diesel, for example, your assets directly emit GHG as a byproduct of internal combustion. These are Scope 1 emissions.

- **Scope 2 emissions**—These encompass all emissions created by generating the electricity, heating, and cooling consumed by your institution.⁶⁷ Light bulbs, for example, unlike an internal combustion engine, do not emit GHG in and of themselves. However, their use might result in GHG emissions created externally by a coal power plant that generates the electricity that powers the light bulbs. Unless you own the coal power plant, in which case its emissions would be your institution’s direct Scope 1 emissions, the emissions associated with light bulbs would be Scope 2 emissions. In other words, Scope 2 emissions are generated to operate your institution, but they are not emitted directly by your institution’s facilities and vehicles.
- **Scope 3 emissions**—These are the indirect emissions by assets both upstream and downstream in your institution’s value chain.⁶⁸ Upstream emissions include GHG emissions associated with purchased products. For example, when you bought your lightbulbs in the Scope 2 example, the manufacturer of those lightbulbs generated its own Scope 1 emissions in the glass manufacturing process and Scope 2 emissions in the powering, heating, and cooling of its facilities. Likewise, the tungsten wire manufacturer that sold filament components to the lightbulb manufacturer generated its own GHG emissions. Lighting your building requires an entire chain of GHG emissions, and everything else you purchase can be accounted for in the same manner. Downstream emissions include GHG emissions similarly associated with your products after you sell them. Ultimately, all emissions are Scope 1 emissions to someone—Scope 3 accounting aims to capture all of an entity’s GHG emissions up and down the value chain so that you have a complete picture of your operations’ full environmental impact.⁶⁹ The upstream and downstream Scope 3 emissions present the most challenges for data collection, so the Greenhouse Gas Protocol developed tools,⁷⁰ recommended

by the EPA,⁷¹ to aid in the measurement of Scope 3 emissions.

For firms hoping to sell products or services to the Government, GHG accounting needs to be part of your sales pitch. Articulating your GHG emissions at all three levels of accounting may give you a **competitive advantage** over other prospective offerors. To the extent that your product or service carries a higher purchase price, accounting for all three levels of GHG emissions may tell Government purchasers why your product or service is worth the price premium and give COs a concrete metric for evaluating your bid or proposal.

If you utilize the available tools and find that your carbon footprint is suboptimally large, the information gained from evaluating your operations and value chain may form the basis of a plan to reduce future GHG emissions. Indeed, the ISO recommends that sustainability metrics should be designed not only to establish performance baselines but to monitor improvements and communicate them to interested parties, whether they be other companies in your supply chain or Federal Government purchasers.⁷² Multiple organizations have developed measurement and reporting programs—introduced in the *Transitioning From “Talk the Talk” To “Walk The Walk”* section below—designed to help you develop these performance measurement systems.⁷³

Outside of the United States as well, firms’ competitiveness in international markets will increasingly depend on their ability to disclose GHG emissions data and demonstrate less harmful outcomes. Certain European markets already demand this data. Closer to home, U.S. Securities and Exchange Commission (SEC) is currently working on climate-disclosure regulation with the support of the Biden Administration.⁷⁴ Learning the GHG accounting tools now and incorporating the resulting data in operations sooner rather than later will put you ahead of the curve.

Eco-Labels & Certifications

For purchasing agencies, until GHG accounting data becomes ubiquitous and reliable, sustainability assessments of all purchasing options may not be feasible on a realistic or useful time scale. As methodologies for measuring environmental impact develop and improve, the broad availability of such data will correspondingly increase, but there is no time to waste.

Eco-labels and **certifications** almost certainly represent the easiest way to begin to achieve sustainability objectives *now*. For example, many consumers and procurement professionals are already familiar with the ENERGY STAR® program, referenced at FAR 23.203.⁷⁵ Third-party certifications, outsourced to private or Government entities that specialize in sustainability assessment, provide a “walk before you run” tool that must play a central role in sustainable procurements while assessment and reporting capacities catch up.

But it’s not quite so simple. If eco-labels are the easiest game to play because they rely on third-party assessments—not the assessments of COs—then eco-labels also provide opportunities for gamesmanship and exploitation. With hundreds of eco-labels in the marketplace,⁷⁶ indiscriminate reliance on eco-labels can lead to “**greenwashing**,” which refers to the glossing over of environmentally damaging behavior through the use of misleading or false claims.⁷⁷ Dilution of eco-labels in general can also undermine the trust in—and therefore the usefulness of—even thoroughly vetted eco-labels.⁷⁸ Accordingly, some level of vigilance, at least a rudimentary effort at due diligence, is required.

Successful use of eco-labels and certifications therefore depends both on proactive monitoring of the eco-label space by Government agencies, as well as a commitment by companies to only use vetted eco-labels for themselves and their supply chains. The EPA maintains a compilation of recommended category-specific eco-labels, as well as guidelines for evaluating other certifications not already on its recommended list.⁷⁹ We strongly encourage gaining familiarity with and utilizing these tools as an efficient shorthand sustainability assessment, especially for organizations in the early days of their sustainable procurement implementation.

At the prime contracting level, eco-labels appear most useful for General Services Administration (GSA) Schedule buys, purchases under the simplified acquisition threshold, and micro-purchases.⁸⁰ Of course, similar mandates and preferences could be flowed down to sub-contractors, suppliers, and vendors throughout the supply chain.⁸¹ Certain certifications, such as the Leadership in Energy and Environmental Design (LEED) rating system,⁸² apply to more complex procurements such as large-scale construction projects, but many eco-labels and certifications are particularly useful for straightforward

commercial product purchases. This does not diminish their importance; in fiscal year 2020, Federal Government agencies spent approximately \$20.6 billion through more than 17.4 million micro-purchase transactions (averaging \$670),⁸³ and, of course, that volume—both in transactions and in dollars (in total and average)—should increase with the recent, dramatic expansion of the micro-purchase threshold.⁸⁴

Eco-labels and certifications offer a great way to get started and an efficient tool to impact a major portion of Federal Government purchases. Make use of them.

Life-Cycle Costing: Overcoming The Tyranny Of Low Prices

Due to the scale and interconnectedness of the global economy, many economic effects that were treated as “externalities” in the twentieth-century have turned into defining social and ecological crises in the twenty-first century.⁸⁵

In an acquisition system that celebrates low purchase prices, much of our acquisition policy and narrative is subjected to, and all too often dominated by, the “**tyranny of low prices**.”⁸⁶ This poses potential hurdles where innovative environmentally sustainable solutions may require a higher up-front purchase price. Accordingly, procurement officials need to reevaluate the **value proposition**⁸⁷ upon which they base their purchasing decisions. Successfully implementing sustainable procurement policies will require acquisition professionals to break free from the persistent focus on low prices⁸⁸ and instead understand and adopt **life-cycle cost (LCC) analysis (LCA or LCCA)**⁸⁹ to determine value. In other words, in assessing the value proposition of various solutions, whether during **acquisition planning** or proposal evaluation, you need to look beyond the end user (or the customer) and consider the **externalities** or the **effects** of the acquisition strategy and contractual outcomes.⁹⁰ Consider that “the hidden costs of fossil fuels[, one of the most significant causes of climate change,] aren’t represented in their market price, despite serious impacts to our health and environment.”⁹¹ For example, “estimates for the total global fossil fuel subsidies paid out each year run as high as \$5 trillion,”⁹² and that doesn’t include the byproducts or costs associated with gasoline-generated engine exhaust such as pollution, reduced life expectancy, increased healthcare costs, infant mortality, etc.

To the extent that sustainable procurement demands that

requirements generators and acquisition professionals think more broadly and, in effect, focus on the “real price” for the solutions you choose, LCC analysis (or, for that matter, total cost of ownership (TCO) or total ownership cost (TOC) analysis, which are conceptually similar⁹³) and increased focus on externalities can bring transparency to the real—yet often hidden, or not immediately obvious—costs of unnaturally inexpensive solutions that we too frequently take for granted. Specifically, procuring agencies, rather than focusing primarily—or, even worse, exclusively—on low purchase prices, “should consider the cost incurred over the life cycle, value for money achieved, and the costs and benefits for society, the environment and the economy resulting from its procurement activities.”⁹⁴ In a nutshell, in addition to the purchase price, LCC analysis takes into account transaction costs as well as operating, maintenance, and disposition costs.

Economists and business strategists—not to mention common sense—have long recognized that LCC analysis provides a much more thorough and accurate picture of what purchasing decisions really cost. As a consumer, this comes as no surprise. You routinely internalize this type of thinking and, accordingly, choose to pay more for goods and services that last longer, fail less frequently, fit more comfortably, look or taste better or more appealing, require less maintenance, cost less to operate, or make your life or work more efficient. In other words, each of us, as consumers, already conceptually understands that low purchase prices often lead to “false economies.”

Fortunately, the topic of LCC is already familiar to many contracts professionals. And procurement professionals can work with the private sector to integrate LCC in the competitive acquisition process. For example, it is unrealistic, especially in these early stages, to expect most COs, without expert assistance, to conduct the sophisticated **market research**⁹⁵ needed for practicable, proactive, LCC-based decisionmaking. Accordingly, as with carbon footprint data, the Government should shift both the burden and the opportunity to the private sector. COs should craft their **requests for proposals (RFPs)** to permit and empower offerors to incorporate LCC analysis into their proposals and demonstrate the less obvious benefits (or reduced harm) associated with their proposed solutions.

This will not be easy. Because budgets are tight, your success will depend upon your ability to explain—most likely on a procurement-by-procurement basis—the long-

term economic imperatives that make a deceptively attractive low purchase price an outcome that is not a bargain for your customer (or our society) in the long term. Over time, as a community, we need to more thoroughly integrate LCC analysis into our thinking, policies, practices, and daily routines, including the real costs of environmental externalities at all phases of procurement—i.e., generating requirements, drafting solicitations and evaluation factors, evaluation and negotiation, and, of course, post-award contract administration and quality control. Specifically, it is critical to also integrate environmental LCC analysis into postaward contract management, evaluate contractors' compliance with their promised life-cycle costs, and follow through on agreed-upon incentive structures that may raise or lower contract prices.

Resilience & Adaptation

If [and that's a big if] global net negative CO₂ emissions were to be achieved and sustained, the global CO₂-induced surface temperature increase would be gradually reversed *but other climate changes would continue in their current direction for decades to millennia.*⁹⁶

Eco-labels and life-cycle costing are powerful tools for incorporating sustainability principles into public procurement. But mitigating climate change (or attempting to slow the speed of the accelerating climate crisis) is only part of the battle for procurement professionals and commercial businesses. We are already dealing with the burgeoning real-life effects of climate change⁹⁷ and will continue to do so at an increasing scale even in best-case scenarios.⁹⁸ Sea levels will continue to rise, heavy precipitation events will intensify, peak wind speeds of tropical cyclones will increase, fires will proliferate, and heatwaves and droughts will worsen.⁹⁹

We must therefore incorporate climate change **adaptation** and **resilience** into public procurements.¹⁰⁰ We need, among other things, roads and runways that can withstand higher heat without melting, higher sea walls on our coasts, air conditioning further north, and more powerful and efficient air conditioning in all locations. The Pacific Northwest experienced a record-breaking heat wave in late June 2021 that melted power cables, buckled roads, and led to the deaths of hundreds of people in a part of North America with relatively few air conditioners.¹⁰¹ Both during and, for that matter, prior to, acquisition planning, requirements generators must endeavor to foresee and take into account the increased frequency and intensity

of extreme climate events by, for example, altering design and performance specifications in construction contracts.¹⁰²

Relatedly, climate resilience also plays an important role in reducing the costs of climate change.¹⁰³ A 2017 EPA technical report on climate change impacts and economic damages found that “[a]daptation actions, especially in the infrastructure sectors, are projected to substantially reduce climate change impacts.”¹⁰⁴ If purchasing decisions are shaped by an understanding that sea levels will continue to rise, tropical storms will continue to intensify, and heat waves will increase in frequency, then we can limit the worst effects of those events and reduce the amount of money that will need to go towards repairs, relocations, and other emergency relief.¹⁰⁵

Remember, reducing greenhouse gas emissions is critical for mitigating the intensity of climate change, but we must also plan and buy differently to dampen the effects of extreme weather events that will continue to occur.

Environmental Justice

The public procurement community is no stranger to social policies, so it comes as no surprise that the **environmental justice** movement takes center stage in sustainable procurement. The call for environmental justice derives from the statistical fact that “[l]ow-income, minority, tribal, and indigenous communities are more likely to be impacted by environmental hazards and more likely to live near contaminated lands.”¹⁰⁶ Moreover, as climate change intensifies, its effects will disproportionately harm those same communities that have suffered environmental injustice for generations.¹⁰⁷ As we undertake efforts to mitigate the progression of climate change and improve climate resilience, it is critical that environmental justice remains a strong underlying priority for Government agencies and commercial businesses.

Sadly, climate change serves to multiply existing inequity and inequality.¹⁰⁸ A September 2021 EPA report¹⁰⁹ details the myriad ways that climate change will continue to burden racial minorities in the United States;¹¹⁰ for example, Black and African American individuals are 40% more likely than other racial groups to live in areas with the highest projected mortality rates from climate-driven changes in extreme temperatures.¹¹¹ Similarly, as climate resilience efforts reshape city planning and construction,

poor and minority communities may once again find themselves forced out of their homes and neighborhoods.¹¹²

Similar dynamics apply on a global scale. The large-scale industrialization that has drastically increased the concentration of carbon dioxide in the atmosphere has historically been concentrated in what are now the wealthiest countries, largely as a result of that very industrialization.¹¹³ Yet the geographically and socioeconomically vulnerable populations that will bear the worst impacts of climate change are often the populations that have least contributed to the problem.¹¹⁴ Although beyond the scope of this BRIEFING PAPER, it is important to recognize that the exacerbation of environmental injustice for vulnerable populations around the world is likely to contribute to the increasingly inevitable and frequent mass migration events that will strain global systems and threaten states' stability.¹¹⁵

Fortunately, at some level, the Federal Government has recognized and incorporated environmental justice into its operations since the early 1990s,¹¹⁶ and President Biden reiterated the Government's commitment to environmental justice in Executive Order 14008.¹¹⁷ However, a 2019 Government Accountability Office report on environmental justice found that, although "[m]ost agencies that signed [a 2011 Memorandum of Understanding] have developed environmental justice strategic plans that contain strategic goals, . . . most have not shown clear progress toward these goals."¹¹⁸ We have our work cut out for us.

Critically, both the public and private sectors must involve individuals from the communities most vulnerable to the effects of climate change and the consequences of resilience efforts into sustainability decisionmaking: "We need every solution and every solver. As the saying goes, to change everything, we need everyone. What this moment calls for is a mosaic of voices—the full spectrum of ideas and insights for how we can turn things around."¹¹⁹

Transitioning From "Talk The Talk" To "Walk The Walk"

Tools & Resources

Ultimately, this BRIEFING PAPER offers a brief introduction and a potentially entry-level informational toolkit.

Each of these short sections deserves a much deeper dive, and we encourage you to build upon this BRIEFING PAPER with further research, reading, professional development, practice, and discussion. But we also implore you to take the initiative and **start now** to implement the Government's sustainable procurement aspirations¹²⁰ to address a worsening climate crisis. It's critical that we keep educating ourselves, but we don't need to reinvent the wheel to start implementing these ideas right away. To that end, the following tools and resources may get you moving in the right direction:

General Information & Meta-Sites

- **Green Procurement Compilation (GPC) (GSA):** GPC consolidates green purchasing **information, requirements, and guidance, organized by product or service category**, in a single online location for use by federal contracting personnel and program managers. The entire GPC database can be downloaded.¹²¹
- **Sustainable Marketplace (EPA):** This is the EPA's homepage for sustainable purchasing. The Sustainable Marketplace provides a starting point for both purchasers and sellers, with separate categories of resources aimed at consumers, federal purchasers, institutional purchasers, and manufacturers. From here you can access, among many other resources, the GSA's Green Procurement Compilation, the EPA's ecolabel recommendations, and a thorough compilation of links, databases, and reports aimed at sellers hoping to contract with the Federal Government.¹²²
- **Sustainable Facilities Tool (SFTool) (GSA):** Focused primarily on the **construction** industry or, in this context **green facilities**, this is a well-designed website containing a broad array of sustainable procurement resources, including learning tools, project planning tools, and interactive virtual walk-throughs of sustainable buildings.¹²³ The content of this powerful and informative tool ranges from basic vocabulary definitions to in-depth case studies of lessons learned.

Products, Services & Standards

- **Comprehensive Procurement Guideline (CPG)**

(EPA): The CPG program maintains a directory of designated products and suppliers that meet recycled content guidelines established by the EPA.¹²⁴ As a Government purchaser (or as a private purchaser) you can search by product to find a list of suppliers that sell CPG-compliant versions of the specific products you need. If you are a seller who satisfies the recycled content recommendations for a designated product, you can add your company to the CPG database and increase your visibility to purchasers.

- **GSA Advantage! Environmental Program Aisle** (GSA): *GSA Advantage!*, the purchasing portal for federal agencies, has a **special shopping area dedicated to green products and services**. Purchasers can search by product category and environmental program or certification.¹²⁵
- **Energy-Efficient Products and Energy-Saving Technologies** (FEMP): The FEMP tool, referenced in FAR 23.203, provides information about energy-efficient products and energy-saving technologies and includes a product search tool, energy- and cost-saving calculators, suggestions for contract language, and case studies.¹²⁶
- **Ecolabels and Standards for Greener Products** (EPA): The EPA has created a central page for learning about and assessing eco-labels and environmental standards. This is an important resource for staying up-to-date with reputable eco-labels and avoiding greenwashing.¹²⁷
- **EPEAT Registry** (Global Electronics Council): The Global Electronics Council (GEC) manages the EPEAT eco-label, which is the leading global label for technology products. The Registry provides a searchable collection of all EPEAT-certified products.¹²⁸

Sustainability Metrics & Reporting

- **EPA Center for Corporate Climate Leadership** (EPA): This page serves as a resource center for companies and organizations looking to improve their GHG measurement and management capabilities. Resources include Scope 1, Scope 2, and Scope 3 GHG accounting guidance, GHG reduction strategies, and supply chain guidance for engaging with suppliers.¹²⁹

- **Science Based Targets Initiative (SBTi)**: SBTi provides a thorough and user-friendly guide for creating sustainability goals for your company and disclosing your progress towards achieving them. The website walks you through, and provides resources for committing to, setting sustainability targets, developing those targets, submitting them to SBT for review, communicating your targets to stakeholders, and disclosing your progress.¹³⁰
- **Calculation Tools** (Greenhouse Gas Protocol): Greenhouse Gas Protocol's Calculation Tools page provides a central location for accessing an extensive list of cross-sector, sector-specific, and country-specific GHG emissions calculation tools. From here you can also access guidance documents and reporting standards to help you develop accurate GHG accounting procedures.¹³¹
- **Simplified GHG Emissions Calculator** (EPA): This page provides a link to a Microsoft Excel spreadsheet specifically created by the EPA to help small businesses and low-emitter organizations inventory their annual GHG emissions. Links within the spreadsheet provide access to guidance that will help your small business inventory emissions, develop GHG reduction goals, and track progress towards those goals.¹³²
- **Global Reporting Initiative (GRI) Standards**: GRI has established and continues to develop common standards for sustainability reporting, both general and sector-specific, to help your company understand and disclose to stakeholders, or in this case Federal Government purchasers, the impacts that your operations have on the climate. In addition to its standards and reporting tools, GRI also provides guidance and support resources to improve your company's reporting capacity.¹³³

Again, this is *not* an exhaustive list. As sustainable procurement becomes more and more of a priority, agencies, organizations, and companies will continue creating helpful tools. Figure out what works for you and be sure to share helpful resources with colleagues and professional networks.

Become Informed: Join The Coalition Of The Willing

For most of us, better understanding the climate crisis inspires our efforts to learn new skills, engage in proactive change, encourage others to join our efforts, and more broadly entrench sustainable procurement as a core part of everything we do in our profession. We don't expect procurement professionals to attempt to sift through the (frankly, overwhelming) reports of the Intergovernmental Panel on Climate Change (IPCC), but we do recommend their highly accessible summary documents, frequently asked questions, fact sheets, and outreach materials.¹³⁴ Sophisticated professional (science-based) investigative journalists, graphic designers, and communications experts continue to create innovative and powerful tools to introduce key concepts and provide useful context.¹³⁵ And, of course, the ever-expanding literature available¹³⁶ includes a gratifyingly diverse set of options to approach different types of readers. Acknowledging that this small and quirky sample is the tiniest tip of the iceberg,¹³⁷ we offer the following well-respected and widely-read books as a potential starting point:

- David Wallace-Wells, *THE UNINHABITABLE EARTH: LIFE AFTER WARMING* (2019) (a popular starting point);
- Hope Jahren, *THE STORY OF MORE: HOW WE GOT TO CLIMATE CHANGE AND WHERE TO GO FROM HERE* (2020) (considered one of the most highly accessible of the genre);
- *ALL WE CAN SAVE: TRUTH, COURAGE, AND SOLUTIONS FOR THE CLIMATE CRISIS* (Ayana Elizabeth Johnson & Katharine K. Wilkinson eds., 2021) (a powerful, diverse essay collection, highlighting women's voices);
- Katherine Hayhoe, *SAVING US: A CLIMATE SCIENTIST'S CASE FOR HOPE AND HEALING IN A DIVIDED WORLD* (2021) (asserting that “[t]he most important thing . . . [we] can do about climate change is talk about it. . . .”);
- Elizabeth Rush, *Rising: DISPATCHES FROM THE NEW AMERICAN SHORE* (2019) (on the more literary end of the spectrum, Pulitzer Prize winner);
- Michael T. Klare, *ALL HELL BREAKING LOOSE: THE*

PENTAGON'S PERSPECTIVE ON CLIMATE CHANGE (2019) (for those whose interests gravitate towards the Department of Defense (DOD) or national security);

- Naomi Oreskes & Erik M. Conway, *THE COLLAPSE OF WESTERN CIVILIZATION: A VIEW FROM THE FUTURE* (2014) (serious *science fiction*, novella); and
- Kim Stanley Robinson, *THE MINISTRY FOR THE FUTURE: A NOVEL* (2020) (serious *science fiction*, full-length).

Information is power. The more you know, the easier you'll find it to embrace the imperative of the work that needs to be done.

Next Steps

Climate change awareness is widespread and growing. Private enterprises are developing new technologies, greener products, and more sustainable means of carrying out their missions. President Biden has repeatedly expressed, through rhetoric and executive orders, that the current Administration is prioritizing climate change. We need to harness this attention and use this momentum. And we can't wait. As Senator Chris Murphy (D-Conn.) recently conceded: “My kids don't understand why I work on anything other than climate change. ‘Why does anything else matter if you don't fix this?’ they wonder.”¹³⁸ Despite presidential sustainable procurement mandates and ongoing efforts that may ultimately lead to expanded legal authorities and guidance for implementing the aspirations and principles discussed in this BRIEFING PAPER, too much is at stake to wait around for more instructions. As legislation, regulation, and policy guidance evolves, we can do our part by taking appropriate actions, progressing up the learning curve, and encouraging others to join us.

For now, this BRIEFING PAPER provides an introduction to the evolving discipline of sustainable procurement, highlights important vocabulary and concepts, offers examples of the rich universe of existing tools and resources that will assist procurement professionals in their efforts to implement sustainable procurement practices, and suggests themes and ideas for discussion in our professional circles. Hopefully, some of this material will help businesspeople gain a competitive edge in a world that will increasingly prioritize sustainable purchasing as well as assist procurement officials tasked with implementing new purchasing frameworks.

Guidelines

Climate change is real, it's here to stay, and if we fail to address it, we only make the effects of the climate crisis worse. These *Guidelines* offer a broad range of actions and initiatives for those throughout the Government contracts community to begin incorporating environmental sustainability into their procurement policies and practices. They are not, however, a substitute for professional representation in any specific situation.

1. *Make sustainable procurement a core competency throughout the acquisition community.* Legislators, regulators, policymakers, heads of contracting activities, leaders at educational institutions and professional organizations (from Defense Acquisition University (DAU) and the Federal Acquisition Institute (FAI) to the National Contract Management Association (NCMA)), as well as the broader oversight community, will need to embrace the imperative of addressing climate change and making sustainable procurement part of our policy, practice, skill set, nomenclature, training, certification, and, ultimately, culture.

2. *Don't reinvent the wheel.* Just because federal procurement laws, regulations, policies, and practices may currently be lacking and will almost certainly evolve (too slowly), do not assume there is nothing you can do. Find and take advantage of existing tools, electronic resources, guidance, and best practices that are currently available.

3. *Rethink and avoid fossil fuel solutions.* Greenhouse gas emissions are the primary anthropogenic driver of climate change. Break the habit of relying on the fossil fuel solution. Broaden your market research and be open to alternative approaches. Utilize life-cycle cost analysis or similar tools to internalize (and attempt to avoid) the very real (and very harmful) costs of continuing to rely on fossil fuel solutions.

4. *Escape the tyranny of low prices.* Broaden your thinking, revise your metrics, and restructure your incentives to ensure that externalities and effects are a part of your assessment of the value proposition during acquisition planning, proposal evaluation, contract pricing (including incentive structures), and contract performance.

5. *Identify, specify, and purchase environmentally preferred products.* From acquisition planning and market research through evaluation of prospective offerors and offers, mandate minimum standards, incorporate eco-

labels or certifications into specifications, or integrate them into evaluation rubrics.

6. *Pick the low hanging fruit.* Particularly below the micro-purchase and simplified acquisition threshold, rely on prequalified or precertified options through reliance on eco-labels or shop, to the extent possible, through the *GSA Advantage! Environmental Aisle*.

7. *Let the private sector help.* If you're a CO, remember that many sectors within the private sector, and many savvy businesses, have been focused on addressing and adapting to climate change for some time. Accordingly, they have more experience and often are far more adept at communicating and quantifying *value* related to, among other things, carbon emissions and footprints. But they can't help unless you remain open to alternative solutions, particularly during market research. Consider posting draft requests for proposals¹³⁹ to ensure you have not foreclosed alternative, more sustainable solutions, with unduly restrictive specifications or evaluation rubrics that emphasize low purchase prices over total costs (including externalities or effects).

8. *Share best practices and helpful resources with colleagues and professional networks.* There is much difficult work to be done, and the learning curve is steep. If something works, spread the word. (It's not a competition; indeed, we're all in this together.)

9. *Raise your voice; talk the talk.* Make addressing the climate crisis part of everything you do, and that includes broadening the coalition of the willing by spreading the word. Don't assume others have thought about what they can do to address climate change. It's not someone else's problem; it's everyone's problem. Don't hesitate to read (outside of your comfort zone or field of expertise) to learn more and strengthen your resolve and enhance your persuasiveness. Engage with experts and like-minded change agents through professional community efforts such as NCMA's nascent Community of Practice.¹⁴⁰ Let's show the next generation that they haven't been completely "betrayed, ignored and abandoned by politicians and adults."¹⁴¹

10. *Implement sustainable procurement initiatives throughout the supply chain.* Government purchasers should demand that prime contractors adopt, quantify, disclose, and demonstrate sustainable practices throughout their value chains. Prime contractors should support

subcontractors and downstream vendors by sharing expertise, helpful tools, and lessons learned.

11. Foster innovation; incentivize success. Recognize your team's or individuals' successes when they implement sustainable principles and achieve measurable results. Generate enthusiasm and draw attention to best practices with inexpensive, high-profile award programs such as the DOE's Office of Environment, Health, Safety & Security GreenBuy Awards program, which recognizes "excellence in 'green purchasing' that extends beyond minimum compliance requirements."¹⁴²

12. Integrate climate change adaptation and resilience into requirements generation, acquisition planning, and specification drafting. Neither the status quo nor historical conditions provide satisfactory assumptions for future planning or specification drafting with regard to temperatures (which will continue to rise), water levels and flooding, frequency and severity of fires and storms, etc. Broader policy planning, of course, needs to account for water and food shortages and related large-scale population migrations.

13. Trust but verify. It makes no sense to pay a price premium for an environmentally friendly solution at the contract formation stage if the contract's **quality assurance**¹⁴³ requirements or oversight mechanisms fail to hold the contractor accountable for fulfilling its promises during contract performance. Among other things, Government buyers must beware of greenwashing. Paying premium prices to firms that make false or misleading claims about sustainability issues wastes valuable resources and adversely impacts the credibility of the procurement system. In addition to incorporating sustainability performance objectives into the contract's specifications and quality assurance plan, consider incorporating key performance indicators (KPIs) and creating meaningful incentive structures—such as bonuses, incentive fees, or award fee pools—that reward providing value (or causing less harm) to not only the end user, but the broader global community.

14. What gets measured gets managed, so focus on metrics. Greater emphasis must be placed on tracking Government-wide and agency-level progress towards achieving sustainability goals. Contractors and prospective contractors should embrace available tools and develop their greenhouse gas accounting (GHG) account-

ing capacity. Agencies should consider mandatory GHG accounting disclosures, and agency-level results should be transparent and compared to other agencies. (A little competition never hurt!) Contractors should increasingly expect GHG accounting data to impact their competitive standing and eventually become a command prerequisite or qualification standard.

15. Act! Do not wait for Congress, the FAR Council, or others. Sure, legislation and regulation may be on the horizon, but we don't have the luxury of waiting for new legislation, implementation of that legislation through amendments to the FAR, or new training programs that have yet to be conceived, designed, staffed, or offered by the DAU or the FAI. Every procurement matters. Do what you can to be part of the solution. Future generations are counting on you.

ENDNOTES:

¹Intergovernmental Panel on Climate Change, Working Group I Contribution to the Sixth Assessment Report of the IPCC, Summary for Policymakers, in *Climate Change 2021: The Physical Science Basis* 10, 19 (Aug. 2021) (emphasis added), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf [hereinafter IPCC AR6 SPM]; see also Al Shaw et al., "New Climate Map Shows a Transformed United States," *ProPublica* (Sept. 15, 2020), <https://projects.propublica.org/climate-migration> (presenting dynamic visualizations of the changes the North American landscape is likely to see in the next 50 years, including extreme heat, crop yields, and wildfires).

²The United Nations (UN) Intergovernmental Panel on Climate Change (IPCC) is made up of 195 UN member governments and is dedicated to assessing the science related to climate change. IPCC scientists read thousands of scientific papers annually to synthesize current scientific agreement regarding climate change and indicate areas in need of further research. IPCC's work culminates every 5-8 years in an assessment report aimed at providing governments with scientific information that can be used to develop climate policy. See About the IPCC, IPCC, <https://www.ipcc.ch/about/>. Created in 1988, the IPCC has published five assessment reports to date, with its Sixth Assessment Report being published in sections in 2021 and 2022. See IPCC Factsheet: Timeline—Highlights of IPCC History, IPCC, https://www.ipcc.ch/site/assets/uploads/2021/07/AR6_FS_timeline.pdf.

³Intergovernmental Panel on Climate Change, Working Group I Contribution to the Sixth Assessment Report of the IPCC, *Climate Change 2021: The Physical Science Basis* (Aug. 2021), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf.

⁴See, e.g., “It’s Official: July Was Earth’s Hottest Month on Record,” National Oceanic and Atmospheric Administration (Aug. 13, 2021), <https://www.noaa.gov/news/its-official-july-2021-was-earths-hottest-month-on-record>; Karin Brulliard & Joshua Partlow, “First-Ever Water Shortage Declared on the Colorado River, Triggering Water Cuts for Some States in the West,” Wash. Post (Aug. 16, 2021), <https://www.washingtonpost.com/nation/2021/08/16/colorado-river-water-cuts-drought/>; Sarah Kaplan, “A Critical Ocean System May Be Heading for Collapse Due to Climate Change, Study Finds,” Wash. Post (Aug. 5, 2021), <https://www.washingtonpost.com/climate-environment/2021/08/05/change-ocean-collapse-atlantic-meridional/>; Julie Ingwersen, “‘Wither Away and Die:’ U.S. Pacific Northwest Heat Wave Bakes Wheat, Fruit Crops,” Reuters (July 12, 2021), <https://www.reuters.com/world/us/wither-away-die-us-pacific-northwest-heat-wave-bakes-wheat-fruit-crops-2021-07-12>.

⁵Sarah Kaplan & Andrew Ba Tran, “Nearly 1 in 3 Americans Experienced a Weather Disaster This Summer,” Wash. Post (Sept. 4, 2021), <https://www.washingtonpost.com/climate-environment/2021/09/04/climate-disaster-hurricane-ida>.

⁶See NOAA National Centers for Environmental Information, Billion-Dollar Weather and Climate Disasters: Time Series, NOAA, <https://www.ncdc.noaa.gov/billions/time-series> (providing an interactive graph of Consumer Price Index-adjusted billion-dollar weather and climate disaster events from 1980 to present day).

⁷See NOAA National Centers for Environmental Information, Billion-Dollar Weather and Climate Disasters: Time Series, <https://www.ncdc.noaa.gov/billions/time-series>.

⁸IPCC AR6 SPM at 28.

⁹White House Press Release, Paris Climate Agreement (Jan. 20, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/paris-climate-agreement>.

¹⁰Exec. Order No. 14008 (Jan. 27, 2021), 86 Fed. Reg. 7619 (Feb. 1, 2021), <https://www.govinfo.gov/content/pkg/FR-2021-02-01/pdf/2021-02177.pdf>; Exec. Order No. 13990 (Jan. 20, 2021), 86 Fed. Reg. 7037 (Jan. 25, 2021), <https://www.govinfo.gov/content/pkg/FR-2021-01-25/pdf/2021-01765.pdf>.

¹¹Exec. Order No. 14027 (May 7, 2021), 86 Fed. Reg. 25,947 (May 12, 2021).

¹²Exec. Order No. 14030 (May 20, 2021), 86 Fed. Reg. 27,967 (May 25, 2021).

¹³Exec. Order No. 14037 (Aug. 5, 2021), 86 Fed. Reg. 43,583 (Aug. 10, 2021).

¹⁴See Carsten Hansen, Waking the Trillion-Dollar Giant: Sustainable Public Procurement (SPP) and the 2030 SDG Agenda 7 (Aug. 2020), [https://www.greengrowthknowledge.org/sites/default/files/SPP%20Article%20-%20Waking%20the%20Giant%20\(Carsten%20Hansen%202020\)%20\(Final\)%2001%20October%202020.pdf](https://www.greengrowthknowledge.org/sites/default/files/SPP%20Article%20-%20Waking%20the%20Giant%20(Carsten%20Hansen%202020)%20(Final)%2001%20October%202020.pdf)

(“[A] key barrier to rolling out SPP activities is overwhelmingly the lack of high-level political buy-in and support from executive management.”).

¹⁵We agree with those who assert that public procurement can play an important role in these efforts. See generally Tanya Filer, “How governments can turn procurement into a climate innovation tool,” Brookings (Sept. 16, 2021), <https://www.brookings.edu/techstream/how-governments-can-turn-procurement-into-a-climate-innovation-tool/>; Sarah Gibbens, “What if the world’s biggest customer went green? The U.S. government wants to find out.,” Nat’l Geographic (Mar. 23, 2021), <https://www.nationalgeographic.com/environment/article/what-if-worlds-biggest-customer-went-green-us-government-wants-to-find-out>.

¹⁶Exec. Order No. 14008, 86 Fed. Reg. at 7623–26.

¹⁷Exec. Order No. 14008, 86 Fed. Reg. at 7623.

¹⁸Exec. Order No. 14008, 86 Fed. Reg. at 7624.

¹⁹The National Contract Management Association (NCMA) publishes the Contract Management Body of Knowledge (CMBOK), an internationally recognized authoritative reference for contract management professionals, which provides practitioners with standardized, common understandings of terminology, practices, policies, and processes used in contract management. Nat’l Cont. Mgmt. Ass’n, Contract Management Body of Knowledge (6th ed. 2019); see also DoD Contracting Competency Model (Contract Management Standard) (based on the NCMA’s Contract Management Standard (ANSI/NCMA ASD 1-2019)), <https://icatalog.dau.edu/onlinecatalog/DoC/CFcompetencys/CONCompetencies.pdf>.

²⁰Int’l Org. for Standardization, ISO 20400, Sustainable Procurement—Guidance § 3.33 (2017).

²¹Int’l Org. for Standardization, ISO 20400, Sustainable Procurement—Guidance § 3.33 note 1 to entry (2017).

²²Int’l Org. for Standardization, ISO 20400, Sustainable Procurement—Guidance § 3.38 (2017).

²³See, e.g., Sustainable Purchasing Leadership Council’s (SPLC’s) (15-minute) Introduction to Sustainable Purchasing, <https://vimeo.com/458283170/4f013267ce>; Sustainability, Chartered Institute of Procurement and Supply (CIPS), <https://www.cips.org/knowledge/procurement-topics-and-skills/sustainability/>.

²⁴Advanced Search, [USAspending.gov](https://www.usaspending.gov), <https://www.usaspending.gov/search> (last visited Sept. 5, 2021). This represented a significant increase and suggests an upward trend. See, e.g., \$440 million in fiscal year (FY) 2015, \$475 million in FY 2016, \$511 million in FY 2017, \$555 million in FY 2018, \$590 million in FY 2019, and \$666 million in FY 2020. Advanced Search, [USAspending.gov](https://www.usaspending.gov), <https://www.usaspending.gov/search> (last visited Sept. 5, 2021).

²⁵Exec. Order No. 14008, 86 Fed. Reg. at 7623–26.

²⁶See, e.g., Env’t Prot. Agency (Ireland), Green Public Procurement: Guidance for the Public Sector (2d ed. 2021), <https://www.gov.ie/en/publication/efa12-green-pub>

[lic-procurement-gpp/](#); Canadian Collaboration for Sustainable Procurement, *Sustainable Procurement Guide* (2021), <https://www.reeveconsulting.com/about-ccsp/>; European Comm'n, *Buying Green: A Handbook on Green Public Procurement* (3d ed. 2016), https://ec.europa.eu/environment/gpp/buying_handbook_en.htm.

²⁷Sustainable Development Goals, United Nations, <https://www.un.org/sustainabledevelopment/sustainable-development-goals>.

²⁸Goal 12: Ensure Sustainable Consumption and Production Patterns, Sustainable Development Goals, United Nations, <https://www.un.org/sustainabledevelopment/sustainable-consumption-production> (“12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities.”).

²⁹Indicator 12.7.1, UN Env't Programme, <https://www.unep.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-12-8>.

³⁰About the Environmentally Preferable Purchasing Program, EPA, <https://www.epa.gov/sustainable-marketplace-greener-products-and-services/about-environmentally-preferable-purchasing>.

³¹Exec. Order No. 12873 (Oct. 20, 1993), 58 Fed. Reg. 54,911 (Oct. 22, 1993) (revoked by Exec. Order No. 13101 (Sept. 14, 1998), 63 Fed. Reg. 49,643 (Sept. 16, 1998)).

³²About the Environmentally Preferable Purchasing Program, EPA, <https://www.epa.gov/sustainable-marketplace-greener-products-and-services/about-environmentally-preferable-purchasing>.

³³See FAR 7.105(b)(17); FAR 7.105(b)(15) (1995) (containing identical language to the current FAR).

³⁴See 62 Fed. Reg. 51,224 (Sept. 30, 1997, effective Oct. 10, 1997).

³⁵FAR 15.605(b)(1)(iv) (1996).

³⁶FAR 15.304.

³⁷See FAR Part 23.

³⁸See, e.g., FAR 23.102; FAR 23.201; FAR 23.402, FAR 23.702, FAR 23.801; FAR 23.901.

³⁹FAR 23.102(a)–(b).

⁴⁰Exec. Order No. 14030 (May 20, 2021), 86 Fed. Reg. 27,967 (May 25, 2021).

⁴¹See FAR Case 2021-015: Disclosure of Greenhouse Gas Emissions and Climate-Related Financial Risk; FAR Case 2021-016: Minimizing the Risk of Climate Change in Federal Acquisitions.

⁴²See FAR Case 2021-015; FAR Case 2021-016; Exec. Order No. 13990 (Jan. 20, 2021), 86 Fed. Reg. 7037 (Jan. 25, 2021); Exec. Order No. 14008 (Jan. 27, 2021), 86 Fed. Reg. 7619 (Feb. 1, 2021); Exec. Order No. 14027 (May 7, 2021), 86 Fed. Reg. 25,947 (May 12, 2021); Exec. Order No. 14037 (Aug. 5, 2021), 86 Fed. Reg. 43,583 (Aug. 10, 2021).

⁴³See Steven L. Schooner & Markus Speidel,

“‘Warming Up’ to Sustainable Procurement,” 60 Cont. Mgmt. 32, 37 (Oct. 2020).

⁴⁴IPCC AR6 SPM at 5.

⁴⁵See Susan Solomon, “Paul J. Crutzen (1933–2021),” *Science* (Feb. 26, 2021), <https://science.sciencemag.org/content/371/6532/892.full>; Jos Lelieveld, “Paul J. Crutzen (1933–2021): Ozone Nobel Prizewinner Who Coined the Term Anthropocene,” *Nature* (Feb. 24, 2021), <https://www.nature.com/articles/d41586-021-00479-0>. Crutzen and colleague Eugene F. Stoermer then immortalized the term in writing in a May 2000 article in the International Geosphere-Biosphere Programme’s Global Change Newsletter. Paul J. Crutzen & Eugene F. Stoermer, “The ‘Anthropocene,’” 41 *Glob. Change Newsl.*, 17 (2000).

⁴⁶The current official geologic epoch, known as the Holocene, began 11,700 years ago after the last major ice age, and corresponds with post-Stone Age history of humans. Rhodes W. Fairbridge, “Holocene Epoch,” *Britannica*, <https://www.britannica.com/science/Holocene-Epoch>.

⁴⁷Anthropocene, Nat’l Geographic, <https://www.nationalgeographic.org/encyclopedia/anthropocene>.

⁴⁸Anthropocene, Nat’l Geographic, <https://www.nationalgeographic.org/encyclopedia/anthropocene>. Since the popularization of the term in the early 2000s, geologists and stratigraphers have been conducting research to determine precisely when humans started leaving evidence of our presence in the geologic strata of the planet. See Meera Subramanian, “Humans Versus Earth: The Quest To Define the Anthropocene,” *Nature* (Aug. 6, 2019), <https://www.nature.com/articles/d41586-019-02381-2>. Multiple research groups have emerged that are dedicated to the topic of the Anthropocene. See, e.g., Anthropocene; Anthropocene Review; Elementa; Anthropocene Working Group, <http://quaternary.stratigraphy.org/working-groups/anthropocene/>.

⁴⁹Will Steffen et al., “Trajectories of the Earth System in the Anthropocene,” 115 *Proc. of the Nat’l Acad. of Scis.* 8252, 8252 (2018) (emphasis added).

⁵⁰See David Wallace-Wells, *The Uninhabitable Earth: Life After Warming* (2019); Hope Jahren, *The Story of More: How We Got to Climate Change and Where To Go From Here* (2020).

⁵¹For example, at the time of writing this, only 55% of Americans have been fully vaccinated against COVID-19 more than four months after broad vaccine rollout in the US. US Coronavirus Vaccine Tracker, USAFACTS, <https://usafacts.org/visualizations/covid-vaccine-tracker-statistics> (last visited Sept. 19, 2021).

⁵²“[T]he climate crisis demands political commitment well beyond the easy engagement of rhetorical sympathies, comfortable partisan tribalism, and ethical consumption.” David Wallace-Wells, *The Uninhabitable Earth: Life After Warming 186–87* (2019).

⁵³Int’l Org. for Standardization, ISO 20400, *Sustainable Procurement—Guidance* § 5.1.11 (2017).

⁵⁴For commitment from the business side, ClimateVoice is an organization with the mission of mobilizing individuals to urge companies to commit to and prioritize climate issues and sustainability. ClimateVoice, <https://climatevoice.org/>.

⁵⁵See Int'l Org. for Standardization, ISO 20400, Sustainable Procurement—Guidance § 4.53 (2017); see also Carsten Jansen & Farid Yaker, A Sustainability-Weighted Procurement Portfolio Model (PPM) (Apr. 2021), https://www.oneplanetnetwork.org/sites/default/files/a_sustainability-weighted_procurement_portfolio_model_esg-ppm_ch_13_july_2021.pdf (proposing a procurement portfolio model based on identifying procurement categories with both high sustainability risk exposure (relevance) and high sustainability impact (significance)).

⁵⁶Hannah Ritchie & Max Roser, CO₂ Emissions, Our World in Data, <https://ourworldindata.org/co2-emissions> (last visited Sept. 17, 2021).

⁵⁷Carbon Dioxide, NASA, <https://climate.nasa.gov/vital-signs/carbon-dioxide> (last visited Sept. 17, 2021).

⁵⁸Overview of Greenhouse Gases, EPA, <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>.

⁵⁹Overview of Greenhouse Gases, EPA, <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>.

⁶⁰Carbon dioxide's role as a contributing factor to global warming has been researched and contemplated by scientists and policymakers for nearly 200 years. See Climate Change: How Do We Know?, NASA, n.2, <https://climate.nasa.gov/evidence/>; Overview of Greenhouse Gases, EPA, <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>.

⁶¹Commonly credited to influential management consultant Peter Drucker (though this origin story is disputed), the full saying addresses the problem that “what gets measured gets managed—even when it's pointless to measure and manage it, and even if it harms the purpose of the organization to do so.” Paul Barnett, “If What Gets Measured Gets Managed, Measuring the Wrong Thing Matters,” 19 Corp. Fin. Rev. 5 (2015). Whether or not you are measuring the right thing, those measurements shape your management strategy; make sure you measure the right thing.

⁶²For a taste of some of the evolving landscape of sustainability performance measurement, see, Office of the Federal Chief Sustainability Officer, Council on Environmental Quality, Federal Sustainability Progress, Plans, and Performance, <https://www.sustainability.gov/performance.html>. Alas, even the most cursory examination of the trend data could inspire pessimism with regard to the feasibility of achieving the dramatic changes necessary during the coming decade.

⁶³See, e.g., Simplified GHG Emissions Calculator, EPA, <https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator>; see also EPA Center for Corporate Climate Leadership, EPA, <https://www.epa.gov/climateleadership> (providing a centralized collection of GHG accounting guidance and tools).

⁶⁴See Greenhouse Gas Protocol <https://ghgprotocol.org/>. GHGP has also developed cross-sector and sector specific tools to enable companies to measure and manage their emissions, as well as online courses to help implement and utilize those tools. The GHG Emissions Calculation Tool, Greenhouse Gas Protocol, <https://ghgprotocol.org/ghg-emissions-calculation-tool>; Calculation Tools, Greenhouse Gas Protocol, <https://ghgprotocol.org/calculation-tools>; Online Training, Greenhouse Gas Protocol, <https://ghgprotocol.org/training-capacity-building>.

⁶⁵About Us, Greenhouse Gas Protocol, <https://ghgprotocol.org/about-us>.

⁶⁶Greenhouse Gas Protocol, Corporate Value Chain (Scope 3) Accounting and Reporting Standard 5 (2011), https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf.

⁶⁷Mary Sotos, Greenhouse Gas Protocol, GHG Protocol Scope 2 Guidance 5 (2015), https://ghgprotocol.org/sites/default/files/standards/Scope%202%20Guidance_Final_Sept26.pdf.

⁶⁸Briefing: What Are Scope 3 Emissions?, Carbon Trust, <https://www.carbontrust.com/resources/briefing-what-are-scope-3-emissions>; Scope 3 Inventory Guidance, EPA, <https://www.epa.gov/climateleadership/scope-3-inventory-guidance>; Emily Pontecorvo, “Big Oil is finally talking about scope 3 emissions. What the heck is scope 3?,” Grist (Feb. 12, 2020), <https://grist.org/energy/big-oil-is-finally-talking-about-the-elephant-in-the-room-the-emissions-footprint-of-its-products>.

⁶⁹See FAQ, Greenhouse Gas Protocol, https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf (Scope 3 emissions can account for up to 90% of a company's total emissions).

⁷⁰Scope 3 Evaluator, Greenhouse Gas Protocol, <https://ghgprotocol.org/scope-3-evaluator>; Greenhouse Gas Protocol, Technical Guidance for Calculating Scope 3 Emissions (2013), https://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf.

⁷¹Scope 3 Inventory Guidance, EPA, <https://www.epa.gov/climateleadership/scope-3-inventory-guidance#resources>.

⁷²Int'l Org. for Standardization, ISO 20400, Sustainable Procurement—Guidance § 6.5.1 (2017) (“[Organizations] should implement a performance measurement system that: establishes a baseline measurement, associated goals, and [key performance indicators]; monitors, assesses and continuously improves performance. . . ; assists in the selection of suitable suppliers; communicates results and engages with decision makers and stakeholders; [and] benchmarks the organization against competitors.”).

⁷³See, e.g., Set a Target, Science Based Targets, <https://sciencebasedtargets.org/set-a-target>; GRI, <https://www.globalreporting.org>; CDP, <https://www.cdp.net/en>.

⁷⁴See Jean Eaglesham & Shane Shifflet, “How Much

Carbon Comes From a Liter of Coke? Companies Grapple With Climate Change Math,” Wall St. J. (Aug. 10, 2021), <https://www.wsj.com/articles/climate-change-accounting-for-companies-looms-with-all-its-complexities-11628608324>; Public Statement, U.S. Secs. & Exch. Comm’n, Public Input Welcomed on Climate Change Disclosures (Mar. 15, 2021), <https://www.sec.gov/news/public-statement/lee-climate-change-disclosures>; Exec. Order No. 14030 (May 20, 2021), 86 Fed. Reg. 27,967, 27,969 (May 20, 2021).

⁷⁵The ENERGY STAR® label, intended to provide “the simple choice for energy efficiency, making it easy for consumers and businesses to purchase products that save them money and protect the environment,” is perhaps the most well-known American example of an effective eco-label. Run by the EPA and the Department of Energy, ENERGY STAR® is a Government-backed eco-label for energy efficient solutions across consumer, commercial, and Government settings. See About Energy Star, Energy Star, <https://www.energystar.gov/about>. See also FAR 2.204 (exceptions), FAR 2.206, and the contract clause, FAR 52.223-15, “Energy Efficiency in Energy-Consuming Products (May 2020).”

⁷⁶Guidelines for the Assessment of Environmental Performance Standards and Ecolabels for Federal Purchasing, EPA, <https://www.epa.gov/greenerproducts/guidelines-assessment-environmental-performance-standards-and-ecolabels-federal> (“There are over 460 standards and ecolabels in the marketplace claiming to validate environmental and human health benefits.”).

⁷⁷See Greenwashing, Investopedia, <https://www.investopedia.com/terms/g/greenwashing.asp> (“Greenwashing is the process of conveying a false impression or providing misleading information about how a company’s products are more environmentally sound. . . . Greenwashing is a play on the term ‘whitewashing,’ which means using misleading information to gloss over bad behavior.”).

⁷⁸Take the three-arrow recycling symbol stamped on plastic goods, for example: “[T]here are very few plastic products that are fully recyclable today, but the chasing arrows symbol on nearly every plastic product in distribution would have the public believe otherwise. As long as we are mislabeling all plastics as recyclable, the shroud of cynicism around the entire recycling system will persist and continue to be a headwind for the recycling industry. What the symbol implies does more harm than good.” Kate Bailey, “Commentary, It’s Time To Remove the Recycling Symbol from Plastics,” Waste 360 (Nov. 16, 2020), <https://www.waste360.com/plastics/its-time-remove-recycling-symbol-plastics-commentary>.

⁷⁹EPA, Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing (Updated Jan. 26, 2021), https://www.epa.gov/sites/default/files/2021-03/documents/epa_recommendations_of_specs_standards_and_ecolabels.pdf 1.26.21.pdf; Guidelines for the Assessment of Environmental Performance Standards and Ecolabels for Federal Purchasing, EPA, <https://www.epa.gov/greenerproducts/guidelines-assessment-environmenta>

[l-performance-standards-and-ecolabels-federal](#). Use these resources as a basis.

⁸⁰See generally FAR Subpart 8.4, and the GSA Schedule, <https://www.gsa.gov/buying-selling/purchasing-programs/gsa-schedule>; FAR Part 13, Streamlined Acquisition Procedures, and FAR Subparts 13.2 & 13.3.

⁸¹See, e.g., FAR 23.203(a)(2), mandating that ENERGY STAR® and FEMP requirements be included in service and construction contracts “that will include the provision of energy-consuming products. . . .”

⁸²Leadership in Energy & Environmental Design, U.S. Green Bldg. Council, <http://leed.usgbc.org/>; Unlike the government-administered ENERGY STAR® program, LEED offers an example of a third-party sustainability assessment created and run by a private non-profit organization, the U.S. Green Building Council. See Why LEED, U.S. Green Building Council, <https://www.usgbc.org/leed/why-leed>.

⁸³Gen. Servs. Admin., GSA SmartPay Purchase Card Statistics Report (2020).

⁸⁴See 85 Fed. Reg. 40,064 (July 2, 2020), <https://www.federalregister.gov/documents/2020/07/02/2020-12763/federal-acquisition-regulation-increased-micro-purchase-and-simplified-acquisition-thresholds>.

⁸⁵Kate Raworth, Doughnut Economics: 7 Ways to Think Like a 21st Century Economist, 123 (2017).

⁸⁶See Steven L. Schooner & Markus Speidel, “‘Warming Up’ to Sustainable Procurement,” 60 Cont. Mgmt. 32, 37 (Oct. 2020).

⁸⁷“Best value means the expected outcome of an acquisition that, in the Government’s estimation, provides the greatest overall benefit in response to the requirement.” FAR 2.101. Sustainable procurement requires us to think more broadly, or beyond the program manager or end user, in determining what “provides the greatest overall benefit” to the government. For example, to the extent that the government exists to serve the public, the public health or quality of life ramifications of the Government continuing to purchase fossil fuel vehicles can no longer be discounted or ignored altogether.

⁸⁸We consider the GSA’s longstanding focus on “prices paid,” particularly through its Transaction Data Reporting (TDR) Pilot, one of the most pernicious examples, because “low prices,” without context, neither reflect nor speak to basic consumer concerns, such as value for money and customer satisfaction. See generally “[T]he TDR pilot is not meeting its intended purpose of improving taxpayer value” Office of the Inspector General, GSA, Report No. A140143/Q/6/P21002, GSA’s Transactional Data Reporting Pilot Is Not Used To Affect Pricing Decisions, (June 24, 2021), <https://www.gsaig.gov/content/gsa-s-transactional-data-reporting-pilot-not-used-affect-pricing-decisions>; Office of the Inspector General, GSA, Report No. A140143/Q/T/P18004, Audit of Transactional Data Reporting Pilot Evaluation Plan and Metrics (July 25, 2018), https://www.oversight.gov/sites/default/files/oig-reports/A140143_2.pdf.

⁸⁹See Jason J. Czarnecki & Steven V. Garsse, “What Is Life-Cycle Costing?” in *Cost & EU Public Procurement Law: Life-Cycle Costing for Sustainability* 3, 8, 10, 14 (Marta Andhov et al., eds., 2019) (“LCC can include[,] capture, measure, quantify, and monetize environmental, social, and health effects of products and services”); Marta Andhov, Roberto Caranta & Anja Wiesbrock, “The European Union Law of Life-Cycle Costing,” *id.* at 20, 30 (“Since the introduction of the new provision [Article 68 of Public Sector Directive 2014/24/EU] LCC have been seen as a tool with a great potential to significantly facilitate [sustainable public procurement] by encouraging contracting authorities to ‘think outside the (price) box in the context of sustainable public procurement.’ ”); Jason J. Czarnecki, *Green Public Procurement: Legal Instruments for Promoting Environmental Interests in the United States and European Union* 132 (2019) (EU “Directive 2014/24 both provides a working definition of life-cycle costing and lays down award criteria through which contracting authorities (and entities) may take account of externalities in their purchasing decisions. . . .”).

⁹⁰“LCA [or LCCA] relies on five principles: (1) bringing a wide range of environmental problems into an integrated assessment framework; (2) capturing these problems in a scientific and quantitative manner; (3) allowing environmental pressures and impact potentials to be related to any defined system, such as a particular type of goods, a service, a company, a technology strategy, a country, etc.; (4) integrating the resource use and emissions over the entire life cycle of the analyzed system, from the extraction of natural resources through material processing, manufacturing, distribution and use, up to recycling/energy valorization and the disposal of any remaining waste; and (5) facilitating comparisons of the environmental performance of different systems/options on an equal basis and helps to identify areas for improvement.” Jason J. Czarnecki, *Green Public Procurement: Legal Instruments for Promoting Environmental Interests in the United States and European Union* 153 (2019) (citing Marc-Andree Wolf et al., European Commission, Joint Research Center, *The International Reference Life Cycle Data System (ILCD) Handbook 17* (2012), <https://eplca.jrc.ec.europa.eu/uploads/JRC-Reference-Report-ILCD-Handbook-Towards-more-sustainable-production-and-consumption-for-a-resource-efficient-Europe.pdf>).

⁹¹“Externalities are sometimes easy to see, such as pollution and land degradation, and sometimes less obvious, such as the costs of asthma and cancer, or the impacts of sea level rise.” Union of Concerned Scientists, *The Hidden Costs of Fuels*, (July 15, 2008, Updated Aug. 30, 2016), <https://www.ucsusa.org/resources/hidden-costs-fossil-fuels>.

⁹²Wallace-Wells at 70. See also Majority Staff of H. Select Comm. on the Climate Crisis, 116th Cong., Rep. on Solving the Climate Crisis at 60 (Comm. Print 2020), available at <https://climatecrisis.house.gov/report> (recommending Congress amend the Federal Power Act to direct FERC to find rates “unjust, unreasonable, unduly discriminatory, or preferential if they do not incorporate the cost of

externalized greenhouse gas emissions”).

⁹³See generally DAU, *Life Cycle Costs (LCC) and Total Ownership Costs (TOC)—A Study in Contrasts*, [http://www.dau.edu/training/career-development/logistics/blog/Life-Cycle-Costs-\(LCC\)-and-Total-Ownership-Costs-\(TOC\)—A-Study-in-Contrasts](http://www.dau.edu/training/career-development/logistics/blog/Life-Cycle-Costs-(LCC)-and-Total-Ownership-Costs-(TOC)—A-Study-in-Contrasts). To be clear, however, the DOD has not moved aggressively to integrate climate-related externalities or effects into LCC or TOC analysis.

⁹⁴ISO 20400, *International Standard: Sustainable Procurement—Guidance*, 7 (1st ed. 2017-04), <https://www.iso.org/standard/63026.html>.

⁹⁵See FAR Part 10.

⁹⁶IPCC AR6 SPM at 39 (emphasis added).

⁹⁷See Sarah Kaplan & Andrew Ba Tran, “Nearly 1 in 3 Americans Experienced a Weather Disaster This Summer,” *Wash. Post* (Sept. 4, 2021), <https://www.washingtonpost.com/climate-environment/2021/09/04/climate-disaster-hurricane-ida>.

⁹⁸IPCC AR6 SPM at 39.

⁹⁹IPCC AR6 SPM at 25, 28.

¹⁰⁰See generally Center for Climate and Energy Solutions, *What is Climate Resilience and Why Does it Matter?* (Apr. 2019); see also Exec. Order No. 14008, 86 Fed. Reg. at 7619 (“The United States will . . . move quickly to build resilience, both at home and abroad, against the impacts of climate change that are already manifest and will continue to intensify according to current trajectories.”).

¹⁰¹See Aarian Marshall, “Oregon’s Buckled Roads and Melted Cables Are Warning Signs,” *WIRED* (July 1, 2021), <https://www.wired.com/story/oregons-buckled-roads-melted-cables-warning-signs>; Kim Malcolm et al., “Nearly 800 People Believed To Have Died in Northwest Heat Wave,” *NPR* (July 12, 2021), <https://kuow.org/stories/nearly-700-people-believed-to-have-died-in-northwest-heat-wave>; Scott Neuman, “The Pacific Northwest Has Limited A/C, Making the Heat Wave More Dangerous,” *NPR* (June 28, 2021).

¹⁰²The Center for Climate and Energy Solutions (C2ES) maintains a helpful portal with links to useful publications and blog posts about climate resilience strategies. Resilience Solutions, Center for Climate and Energy Solutions, <https://www.c2es.org/category/climate-solutions/resilience-solutions>.

¹⁰³“The cumulative cost of extreme weather events and climate-related disasters to our transportation, energy, water, sewer, and other infrastructure has exceeded \$1.5 trillion since 1980.” Invest in 21st Century Infrastructure, Nat’l Res. Def. Council, <https://www.nrdc.org/issues/invest-21st-century-infrastructure>.

¹⁰⁴EPA, *Multi-Model Framework for Quantitative Sectoral Impacts Analysis: A Technical Report for the Fourth National Climate Assessment 3* (2017), https://www.epa.gov/sites/default/files/2021-03/documents/ciraii_technicalreportfornc4_final_with_updates_11062018.pdf (“Proactive adaptation measures implemented in anticipa-

tion of future climate change risks are generally more cost-effective in reducing damages than adaptation responses implemented after impacts have already occurred.”).

¹⁰⁵See, e.g., Adam B. Smith, “2020 U.S. Billion-Dollar Weather and Climate Disasters in Historical Context,” Climate.gov (Jan. 8, 2021), <https://www.climate.gov/news-features/blogs/beyond-data/2020-us-billion-dollar-weather-and-climate-disasters-historical> (“There were 22 separate billion-dollar weather and climate disasters across the United States, shattering the previous annual record of 16 events . . .”).

¹⁰⁶EPA, EPA Annual Environmental Justice Progress Report FY 2020 5 (2020), https://www.epa.gov/sites/default/files/2021-01/documents/2020_ej_report-final-web-v4.pdf.

¹⁰⁷See, e.g., “Ten Years on, Hurricane Katrina’s Scars Endure for Black New Orleans,” Reuters (Aug. 6, 2015), <https://www.reuters.com/article/us-usa-katrina-anniversary/ten-years-on-hurricane-katrina-scars-endure-for-black-new-orleans-idUSKCN0QB2AS20150806> (“[R]ecovery [from Hurricane Katrina] has been uneven in the city [of New Orleans] . . . Many properties still bear physical scars from the hurricane, particularly in poorer African-American neighborhoods . . . The black population of the city, long a hub of African-American culture, has plummeted since Aug. 29, 2005.”).

¹⁰⁸S. Nazrul Islam & John Winkel, Climate Change and Social Inequality 6 (U.N. Dep’t Econ. & Soc. Affs., Working Paper No. 152, 2017) (noting that climate change aggravates inequality for disadvantaged groups through “increase in the exposure to climate hazards,” “increase in the susceptibility to damage caused by climate change,” and “decrease in the ability to cope with and recover from the damage”).

¹⁰⁹EPA, Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts (2021), https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf.

¹¹⁰See Darryl Fears & Dino Grandoni, “EPA Just Detailed All the Ways Climate Change Will Hit U.S. Racial Minorities the Hardest. It’s a Long List.” Wash. Post (Sept. 2, 2021), <https://www.washingtonpost.com/climate-environment/2021/09/02/ida-climate-change/>.

¹¹¹Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts, EPA 6 (2021), https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf.

¹¹²See What is Climate Gentrification?, Nat’l Res. Def. Council (Aug. 27, 2020), <https://www.nrdc.org/stories/what-climate-gentrification> (“The efforts to redevelop or build new structures that can withstand the impacts of intensifying storms, flooding, erosion, and sea-level rise may inadvertently pose new threats to low-income communities of color.”).

¹¹³See Climate Change, Ctr. for Glob. Dev., <https://www.cgdev.org/topics/climate-change> (“Historically, the responsibility for climate change . . . rested with the rich

countries that emitted greenhouse gases unimpeded from the Industrial Revolution on—and became rich by doing so.”).

¹¹⁴See e.g., Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries, United Nations Framework Convention on Climate Change 5 (2007) (“Over the next decades, it is predicted that billions of people, particularly those in developing countries, face shortages of water and food and greater risks to health and life as a result of climate change.”); Justin Worland, “Climate Change Has Already Increased Global Inequality. It Will Only Get Worse,” TIME (Apr. 22, 2019), <https://time.com/5575523/climate-change-inequality>; Germana Canzi, What is Climate Justice?, World Economic Forum (Aug. 4, 2015), <https://www.weforum.org/agenda/2015/08/what-is-climate-justice>.

¹¹⁵See Michael T. Klare, All Hell Breaking Loose: The Pentagon’s Perspective on Climate Change 166–170 (2019); Int’l Org. for Migration & United Nations Off. of the High Representative for Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, Climate Change and Migration in Vulnerable Countries 1 (2019), https://publications.iom.int/system/files/pdf/climate_change_and_migration_in_vulnerable_countries.pdf.

¹¹⁶In 1994, President Clinton signed Executive Order 12898, which mandated that each Federal agency “make environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” Exec. Order No. 12898, 59 Fed. Reg. 7629 (Feb. 11, 1994). Among other environmental justice initiatives, the Executive Order established the Federal Interagency Working Group on Environmental Justice (EJ IWG), which “provides a forum for Federal agencies to collectively advance environmental justice principles . . . [and] increase local community capacity to promote and implement innovative and comprehensive solutions to environmental justice issues.” Federal Interagency Working Group on Environmental Justice (EJ IWG), EPA, <https://www.epa.gov/environmentaljustice/federal-interagency-working-group-environmental-justice-ej-iwg>.

¹¹⁷See Exec. Order No. 14008, 86 Fed. Reg. at 7,622, 7,629, 7,631–32.

¹¹⁸U.S. Gov’t Accountability Off., GAO-19-543, Environmental Justice: Federal Efforts Need Better Planning, Coordination, and Methods to Assess Progress 13 (2019), <https://www.gao.gov/assets/gao-19-543.pdf> (emphasis added).

¹¹⁹Ayana Elizabeth Johnson & Katharine K. Wilkinson, Begin, in All We Can Save: Truth, Courage, and Solutions for the Climate Crisis xvii (Ayana Elizabeth Johnson & Katharine K. Wilkinson eds., 2021).

¹²⁰Exec. Order No. 14008, 86 Fed. Reg. at 7623–26.

¹²¹Green Procurement Compilation, GSA, <https://www>

[w.gsa.gov/tools-overview/buying-and-selling-tools/green-procurement-compilation](https://www.gsa.gov/tools-overview/buying-and-selling-tools/green-procurement-compilation).

¹²²Sustainable Marketplace: Greener Products and Services, EPA, <https://www.epa.gov/greenerproducts>.

¹²³SFTool, <https://www.sftool.gov>.

¹²⁴Comprehensive Procurement Guideline (CPG) Program, EPA, <https://www.epa.gov/smm/comprehensive-e-procurement-guideline-cpg-program>.

¹²⁵Welcome to the GSA Environmental Program aisle on GSA Advantage, GSA, https://www.gsaadvantage.gov/advantage/ws/search/special_category_search?cat=ADV.ENV.

¹²⁶Federal Energy Management Program's Energy-Efficient Products and Energy-Saving Technologies, <https://www.energy.gov/eere/femp/energy-efficient-products-and-energy-saving-technologies>.

¹²⁷Introduction to Ecolabels and Standards for Greener Products, EPA, <https://www.epa.gov/greenerproducts/introduction-ecolabels-and-standards-greener-products>.

¹²⁸EPEAT Registry: Your Resource for Sustainable Electronics, Glob. Elecs. Council, <https://epeat.net>.

¹²⁹EPA Center for Corporate Climate Leadership, EPA, <https://www.epa.gov/climateleadership>.

¹³⁰Set a Target, Sci. Based Targets Initiative, <https://sciencebasedtargets.org/step-by-step-process>.

¹³¹Calculation Tools, Greenhouse Gas Protocol, <https://ghgprotocol.org/calculation-tools>.

¹³²Simplified GHG Emissions Calculator, EPA, <https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator>.

¹³³Get Started with Reporting, Global Reporting Initiative, <https://www.globalreporting.org/how-to-use-the-gri-standards/get-started-with-reporting>.

¹³⁴"The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change." See generally <https://www.ipcc.ch/>. For specific examples, see <https://www.ipcc.ch/report/ar6/wg1/>.

¹³⁵See, e.g., Julia Rosen, "The Science of Climate Change Explained: Facts, Evidence and Proof: Definitive answers to the big questions," N.Y. Times (April 19, 2021,

Updated Sept. 7, 2021), <https://www.nytimes.com/article/climate-change-global-warming-faq.html>; Introduction to Climate Change, Let's Talk Science (Canada, Jan. 14, 2021), <https://letstalkscience.ca/educational-resources/backgrounders/introduction-climate-change>; Al Shaw, Abrahm Lustgarten, ProPublica & Jeremy W. Goldsmith, et al., The Great Climate Migration: A Warming Planet and a Shifting Population, ProPublica, <https://www.propublica.org/series/the-great-climate-migration>; Henry Fountain, et. al. "A Crash Course on Climate Change, 50 Years After the First Earth Day," N.Y. Times, (Apr. 3, 2020), <https://www.nytimes.com/interactive/2020/04/19/climate/climate-crash-course-1.html>.

¹³⁶We've come a long way since, for example, Al Gore, Earth in the Balance: Ecology and the Human Spirit (1992).

¹³⁷Obviously, innumerable alternative lists are available. See, e.g., Gal Beckerman, Gregory Cowles & Jounama Khatib, "The Year You Finally Read a Book About Climate Change," N.Y. Times, (April 19, 2020), <https://www.nytimes.com/interactive/2020/climate/climate-change-e-books.html>; Christianne Taylor, "The Top 10 Nonfiction Climate Change Books You Should Read in 2021," Who's Saving the Planet? (Feb. 11, 2021), <https://whosavingtheplanet.com/read/lifestyle/the-top-10-nonfiction-climate-change-books-you-should-read-in-2021/2021-02-11>.

¹³⁸See <https://twitter.com/ChrisMurphyCT/status/1435937882351484931>.

¹³⁹See FAR 15.201(c)(6).

¹⁴⁰See, e.g., <https://www.ncmahq.org/climate>.

¹⁴¹Roger Harrabin, "Climate change: Young people very worried—survey," BBC (Sept. 14, 2021) <https://www.bbc.com/news/world-58549373>; see also How youth climate anxiety is linked to government inaction, https://seecure.avaaz.org/campaign/en/climate_anxiety_panel/.

¹⁴²GreenBuy Awards, Energy.gov, <https://www.energy.gov/ehss/greenbuy-awards>. The Climate Leadership Conference's Climate Leadership Awards are another example of a low-cost high-impact program that "recognizes and incentivizes exemplary corporate, organizational, and individual leadership in response to climate change." Climate Leadership Awards, Climate Leadership Conf., <https://climateleadershipconference.org/awards>.

¹⁴³See FAR Part 46.

BRIEFING PAPERS