WASHINGTON — In nearly eight years in office, President Obama has sought to reshape the nation with a sweeping assertion of executive authority and a canon of regulations that have inserted the United States government more deeply into American life.

Once a presidential candidate with deep misgivings about executive power, Mr. Obama will leave the White House as one of the most prolific authors of major regulations in presidential history.

Blocked for most of his presidency by Congress, Mr. Obama has sought to act however he could. In the process he created the kind of government neither he nor the Republicans wanted — one that depended on bureaucratic bulldozing rather than legislative transparency. But once Mr. Obama got the taste for it, he pursued his executive power without apology, and in ways that will shape the presidency for decades to come.

The Obama administration in its first seven years finalized 560 major regulations — those classified by the Congressional Budget Office as having particularly significant economic or social impacts. That was nearly 50 percent more than the George W. Bush administration during the comparable period, according to data kept by the regulatory studies center at George Washington University.

An army of lawyers working under Mr. Obama's authority has sought to restructure the nation's health care and financial industries, limit pollution, bolster workplace protections and extend equal rights to minorities. Under Mr. Obama, the government has literally placed a higher value on human life.

And it has imposed billions of dollars in new costs on businesses and consumers.

Many of the new rules are little known, even as they affect the way Americans eat, love and die. People can dine on genetically engineered salmon. Women can buy emergency contraceptive pills without prescriptions. Military veterans can design their own headstones.

In its final year, the administration is enacting some of its most ambitious rules, including limits on airborne silica at job sites, an overhaul of food labels to clarify nutritional information, and a measure making millions of workers eligible for overtime pay.

The administration's regulatory legacy has become an issue in the campaign to replace Mr. Obama, as Donald J. Trump has sharply criticized regulatory overreach and promised to undo many of the new rules. But executive power has expanded steadily under both Republican and Democratic presidents in recent decades, and both Mr. Trump and Hillary Clinton have promised to act in the service of their own goals.

The new rules built on the legislative victories Mr. Obama won during his first two years in office. Those laws — the Affordable Care Act, the Dodd-Frank Act and the $800 billion economic stimulus package — transformed the nation's health care system, curbed the ambitions of the big banks and injected financial support into a creaky economy. But as Republicans increased their control of Capitol Hill, Mr. Obama's deep frustration with congressional opposition led to a new approach: He gradually embraced a president's power to act unilaterally.

History may now judge the regulations to be one of Mr. Obama's most enduring legacies. At the least, his exercise of administrative power expanded and cemented a domestic legacy that now rivals Lyndon B. Johnson's Great Society in reach and scope.

In May, Mr. Obama was asked by a farmer in Elkhart, Ind., to justify the "dramatic increase" in government regulations that affected his business. "I'm not interested in regulating just for the sake of regulating," Mr. Obama responded. "But there are some things like making sure we've got clean air and clean water, making sure that folks have health insurance, making sure that worker safety is a priority — that, I do think, is part of our overall obligation."

Infuriated Republicans describe many of the new rules as unwarranted, resulting in “less jobs, less businesses, less prosperity, lower take-home pay,” in the words of the House speaker, Paul D. Ryan. Business groups, also incensed, have challenged a number of new regulations in court, delaying them or preventing them from taking effect. Some economic experts worry that the accumulation of regulation is contributing to the economy’s persistent sluggishness.

“The big issue that I grapple with is that the regulatory state keeps growing,” said Robert Hahn, an economist and a regulatory expert at the Smith School at the University of Oxford. “And as it keeps growing, when does it become too much?”

Not Inherently a Regulator

Mr. Obama entered office in January 2009 determined to make his mark by passing bold new laws, not by tinkering with rules. Rahm Emanuel, his first chief of staff, and other top aides mapped out an ambitious two-year agenda that included a health care overhaul, new banking laws, a remake of the federal student loan program, infrastructure spending and stricter limits on pollution.

The new president had a skeptical streak when it came to the value of regulation, influenced by his friend Cass R. Sunstein, a Harvard Law professor who had long argued that the government should more rigorously assess the benefits of new regulations. Mr. Obama liked that idea so much that he named Mr. Sunstein to lead the White House office that oversees rule-making.

“The president is not somebody who is intuitively or inherently a regulator,” said Howard Shelanski, who followed Mr. Sunstein in that role in mid-2013. He said Mr. Obama conveyed a simple message: “‘If we can get a good result without regulating, let’s do that.’”

But after eight years of a Republican administration, many Democrats were eager for the government to lean more forcefully on the levers of regulatory power, and officials within the federal bureaucracy felt emboldened.

The White House did resist some ideas. It shut down efforts by Lisa Jackson, Mr. Obama's first administrator of the Environmental Protection Agency, to increase the regulation of ozone, a decision that environmentalists viewed as a betrayal.

But other rules were allowed to proceed. Kate Hanni, an advocate from Napa, Calif., for the rights of airline passengers, had tried for years to persuade the government to address a series of incidents in which flight delays left passengers trapped for hours on planes that had already left the gate, often in cabins with stinking toilets, weak air-conditioning and no food. The Bush administration put Ms. Hanni on a task force consisting mostly of airline executives, which concluded in the fall of 2008 — over her forceful and repeated objections — that the public was best served by allowing the airlines to make their own decisions.

Weeks after the task force released its report, Ms. Hanni was invited to Washington in December 2008 to meet with Robert S. Rivkin, the head of Mr. Obama's transportation transition team. Democrats in Congress had introduced legislation to address the issue, but Mr. Rivkin asked Ms. Hanni if she would support new regulations instead. She would back anything enforceable, Ms. Hanni said.

"Right answer," he replied.

Over the course of the next nine months, Mr. Rivkin and his team of career regulators at the Department of Transportation developed rules prohibiting planes loaded with passengers from sitting on the tarmac for more than three hours.

In meetings with Ray LaHood, Mr. Obama's first transportation secretary, and his staff, airline representatives argued for flexibility, saying rigid timelines would only increase flight cancellations. They chafed at the regulators' willingness to see the benefits but not the costs.

Sharon L. Pinkerton, an executive at Airlines for America, the industry's main trade group, recalled Transportation Department regulators suggesting that "unquantifiable, unidentifiable benefits" would "outweigh the costs" of new rules for the airlines.

"What are we supposed to do with that?" she asked later in an interview.

But Mr. LaHood had himself experienced long waits on the runway during frequent trips home to Illinois. Just days before Christmas in 2009, he announced a Passenger Bill of Rights, which for the first time levied fines of up to $27,500 per passenger on airlines that leave domestic flights stranded for more than three hours. He challenged the major carriers to provide their service “in a way that is halfway convenient” for their customers.

His department, Mr. LaHood said in a recent interview, had a new sense of purpose, independent of any specific directive from the White House.

“They had other fish to fry,” Mr. LaHood said of senior officials at the White House. “We didn’t want to wait around for Congress to take five, 10 years to do this. We could do this by rule and regulation, so we were pretty much off to the races.”

Other agencies were moving too. In its second year, bureaucrats working across the government completed 96 major rules, more than in any subsequent year.

Equal Rights for Everyone

The White House soon began to take a greater interest in regulation.

In May 2009, Mr. Emanuel raised concerns about Janice Langbehn, a social worker featured in The New York Times who was barred from visiting her hospitalized same-sex partner.

Passing legislation to address the problem was unlikely, Mr. Emanuel knew, given entrenched ideological opposition and the White House’s focus on overhauling the health insurance system. But Nancy-Ann DeParle, director of the newly created Office of Health Reform, suggested an alternative: The administration had the power to impose conditions on hospitals that got federal Medicare funding.

A year later, the president directed the Department of Health and Human Services to develop regulations requiring hospitals to extend visitation rights to same-sex partners.

“All too often, people are made to suffer or even to pass away alone, denied the comfort of companionship in their final moments while a loved one is left worrying and pacing down the hall,” Mr. Obama wrote in an April 2010 memo.

A focus on similar issues produced more than 100 executive actions and regulatory changes intended to improve the lives of lesbian, gay, bisexual and transgender people, particularly after the Supreme Court in 2013 struck down the federal law that defined marriage as between a man and a woman.

People with H.I.V. were no longer barred from entry into the country; federal housing rules recognized lesbian, gay, bisexual and transgender families; health insurance companies were barred from discriminating against gay people; labor protections applied to gay couples; married same-sex couples could take family and medical leave; and the Internal Revenue Service started treating same-sex couples no differently.

“These are really lasting things,” said David Stacy, the government affairs director for the Human Rights Campaign, a gay rights advocacy organization. “They affect people in their everyday lives.”

The Value of Regulation

As the Obama administration turned toward regulation, it sought to strengthen its hand by changing the estimates of what a life is worth. Those estimates allowed the administration to argue that the benefits of many regulations were greater than previously appreciated. This push was particularly important as a justification for stronger environmental protections.

A White House push to pass a sweeping climate change bill in 2009 failed to pass in Congress, but almost from the outset some of Mr. Obama’s aides were working on a Plan B. Mr. Sunstein and Michael Greenstone, the first chief economist

Embrace It

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By BINYAMIN APPELBAUM and MICHAEL D. SHEAR

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of Mr. Obama’s Council of Economic Advisers, created an internal task force to put a dollar figure on the cost of carbon emissions.

The government does not try to quantify all the benefits of proposed regulations. When it came to environmental regulations, the calculation was particularly limited. Analysts often assigned a dollar figure to just one kind of damage — emissions of “small particles” — and then stacked up the costs of the proposal against the benefits of fewer particles.

Quantifying a second kind of damage, from carbon emissions, would broaden the assessed benefits of new regulations — potentially justifying new and stronger restrictions. In 2010, the administration issued a report that estimated the economic impact of global warming, including agricultural disruptions, increased flooding and health problems. It pegged the cost of carbon emissions at $21 per ton. An updated assessment in 2013 raised the price tag to $33.

When the administration announced stricter standards for automobile fuel efficiency in 2011, it cited the reduction in carbon emissions as a key benefit. Those benefits have since been cited in several dozen new regulations, including the hotly debated 2015 rule seeking to restrict emissions from new power plants.

Regulators also revisited a more fundamental concept: the value of life. Not just a theological or philosophical abstraction, that figure is used to assess how much spending the government should require to prevent death or injury.

The Department of Transportation, for example, increased the estimated value of preventing one death from $6.6 million in 2009 to $9.4 million last year, adjusting for inflation. The department made an even larger adjustment for preventing injuries, for example raising the value of averting a broken arm from $103,000 in 2009 to $442,000 in 2015, also adjusting for inflation. The increases have helped to justify new requirements for stronger roofs and rearview cameras on automobiles and seatbelts on buses.

The new carbon cost estimate, in particular, has drawn fire from industry groups who regard it as an arbitrary assessment intended to further an environmental agenda.

Environmentalists, however, argue that the government is still significantly understating the actual impact. A 2014 analysis by economists at Stanford University, published in the science journal Nature, estimated that the cost of carbon was actually $220 per ton, far above the government's official estimate.

Mr. Greenstone, in a recent interview, defended the government's number as a result of a technocratic process that was not influenced by political pressures.

"Our job as faceless bureaucrats sitting in windowless rooms was not to do science but to summarize the frontier of science," he said. " And I feel that we were faithful to that."

The Room Where It Happens

By the fall of 2011, after a summer standoff between the two political parties nearly caused a government shutdown, it was clear to Mr. Obama that little hope remained for moving his agenda forward in a Congress controlled by Republicans.

Speaking in Las Vegas that October, Mr. Obama expressed disdain for "an increasingly dysfunctional Congress" and pledged: "Where they won't act, I will."

That sentiment kicked off a slow-moving realignment as White House officials held a series of strategy meetings that fall in the Roosevelt Room, first with Mr. Obama on Saturdays and later with agency and policy experts, usually on Tuesdays and Fridays. Led by Ms. DeParle, who had become deputy chief of staff, and Dan Pfeiffer, the communications director, they asked: What can we do without Congress?

"It's certainly true that we learned by about the third year that the answer to every challenge isn't going to be legislative," said Cecilia Muñoz, now director of Mr. Obama's Domestic Policy Council.

The pace of regulation stalled somewhat in 2012, amid political concerns about announcing sweeping new regulations during the campaign. In 2013, Mr. Obama's team briefly hoped his victory would lead to legislative progress, but Republicans blocked gun control measures and an immigration overhaul, and partisan gridlock shut the government down for 15 days that October.

In early 2014, the moment was finally ripe. Mr. Obama recruited John D. Podesta, then the head of the Center for American Progress, a liberal research and policy institution, to be his counselor in the White House

"The weight, if you will, changed with a very recalcitrant Republican House, and with both the House and the Senate being part of the 'Nyet!' caucus," Mr. Podesta said. "It meant that you had to be seriously concerned with trying to make change happen with the tools that you had available."

A Year of Action

In January 2014 a frustrated president stood before Congress and declared "a year of action" — with or without the help of the Republicans arrayed before him.

"Whenever I can take steps without legislation to expand opportunity for more American families, that's what I'm going to do," Mr. Obama said in his State of the Union address.

Mr. Obama announced an executive order raising the minimum wage to $10.10 an hour for several hundred thousand cooks, janitors and other federal contract workers. In subsequent orders, each resulting in a new regulation, the president required contractors to let their workers take paid sick days and banned discrimination against lesbian, gay, bisexual and transgender workers. He also increased workplace protections for all workers at businesses that held federal contracts — an umbrella covering roughly 29 million workers.

“What the president was ultimately doing was holding up the United States government as a model employer,” said Joseph Geevarghese, director of Good Jobs Nation, a union-backed advocacy group that pressed the administration to embrace its regulatory power. “And it created a ripple effect. Within months of the president acting you had private C.E.O.s — Ikea, Gap, Disney, airlines — saying they too were going to boost minimum pay.”

The new regulations again required the White House to broaden its assessment of regulatory benefits. During Mr. Obama’s first term, administration officials told Mr. Geevarghese and other activists that the government did not have the power to make such changes. But after Mr. Obama’s re-election, they found a way: White House lawyers concluded that the president could impose requirements on contractors in the interest of taxpayers.

Betsey Stevenson, a member of the president’s Council of Economic Advisers, took the lead in building a case that contractors who paid higher wages would attract and retain better workers, increasing their productivity.

The theory holds, for example, that if the lunch lines at a federal office building moved a little more quickly because of more competent, motivated cafeteria workers, every employee in those lines would save a few minutes a day and have more time to work, thus increasing productivity.

The idea has its roots in work by George Akerlof, a Nobel Prize-winning economist, and his wife, Janet Yellen, now chairwoman of the Federal Reserve, who decided in the early 1980s to pay their babysitter above-market wages as motivation.

With the president’s blessing, the E.P.A. also became more aggressive. The agency asserted federal authority to protect thousands of waterways and wetlands, proposed to cap carbon emissions at new and existing power plants, raised emissions standards for trucks and airplanes, and called for new limits on methane, mercury and ozone.

“He has been much more ambitious and aggressive on environmental regulation than any other president we’ve had,” said Jeffrey Holmstead, a lawyer pursuing legal challenges to some of Mr. Obama’s signature environmental rules.

Courts have now temporarily blocked the administration's water rules and delayed the power plant limits on carbon dioxide emissions. The next administration will also have considerable leeway to determine how quickly new rules are carried out, and how strictly enforced.

The Next White House

Every president promises to prune the federal rule book.

Mr. Obama has tried to formalize the process for reviewing existing regulations, and the two candidates vying to take his place, Hillary Clinton and Donald J. Trump, have nodded at the need to ease the burdens of regulation.

But the scope of federal regulation has continued to grow, and the trend is likely to continue. Presidents, both Democratic and Republican, have asserted greater power in recent decades to dictate the shape of regulations, while Congress has become less specific in its instructions.

"We live in an era of presidential administration," Elena Kagan, a Harvard law professor since appointed by Mr. Obama to the Supreme Court, wrote in a 2001 paper that reviewed the expansion of the regulatory state.

Both Mrs. Clinton and Mr. Trump would most likely face significant congressional opposition to their major campaign promises. To sidestep Congress, they now have the legacy of Mr. Obama. Mr. Podesta, now Mrs. Clinton's campaign chairman, said the appeal of taking action without Congress is hard to resist.

"You come in with a strategy of going to the Hill, certainly where you can find some cooperation," Mr. Podesta said. But when that fails, writing regulations "is a way to get much more substantial throw-weight behind solving the problem."

Correction: August 15, 2016

An earlier version of this article misstated the role of Michael Greenstone on the Council of Economic Advisers. He was its first chief economist under President Obama, not its first head.

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