





Jeremy Rifkin W'67

launched his career as an activist by protesting the Vietnam War. Now he's making perhaps his biggest impact yet advocating for a "third industrial revolution" to save the world from stagnating productivity and the ravages of climate change.

By Alyson Krueger

At the tail end of the Great Depression and on the eve of a second World War, 44 million people flocked to the 1939 World's Fair in Flushing Meadows in Queens, New York, and its most popular exhibit—the "Futurama," in General Motors's "Highways and Horizons" pavilion.

They marveled at large cities full of skyscrapers, department stores, and parking lots, all lit up by electric lamps. They were delighted to see suburbs of spacious homes with generous backyards. They viewed hydroelectric plants lighting up the countryside, thriving farms, airports with miniature planes flying above them, and an Interstate Highway system that linked all of it together and made this imagined world of 20 years hence possible.

"This 1960 drama of highway and transportation progress is but a symbol of future progress in every activity made possible by constant striving toward new and better horizons," gushed a brochure for the exhibit produced by General Motors. "Who can say what new horizons lie before us if we but have the initiative and imagination to penetrate them—new economic horizons—new social horizons—new horizons in many fields, leading to new benefits for everyone, everywhere."

The vision embodied in the Futurama exhibit was so compelling that it helped influence government policy. The exhibit's designer, Norman Bel Geddes, was instrumental in causing President Franklin D. Roosevelt to sign the Federal Highway Act of 1944 as a first step toward building those super highways. In due course, that future became reality—with all the inevitable compromises, unintended consequences, and disappointments alongside its technological and economic achievements.

Here in our present, the mighty infrastructure built in that burst of post-war optimism and energy is crumbling from decades of neglect, the productivity gains that fueled economic progress have leveled off, wages have been stagnant for the vast majority of workers for a generation or more, and the dire effects of climate change grow increasingly obvious even as the political "debate" over its existence continues unabated.

But all is not lost. It's just time for a *new* vision of the future, says economist, social theorist, and longtime activist Jeremy Rifkin W'67. And Rifkin has articulated that vision in both a

New York Times bestselling book published in 2011, *The Third Industrial Revolution: How Lateral Power Is Transforming Energy, the Economy, and the World*, and a documentary film produced by Vice Media that premiered last spring at the trendy Tribeca Film Festival in New York.

Rifkin contends that industrial revolutions are born out of transformations in three areas: communications, energy, and transportation. In his analysis, steam power, the telegraph, and coal-driven railroad transportation were

the key forces propelling the first industrial revolution, launched in 19th-century Britain. That was succeeded by a second industrial revolution in the United States in the 20th century built around centralized electricity; the telephone, radio, and television; and cheap oil and the automobile.

The technologies responsible for the third industrial revolution will revolve around digitization and renewable energy, he says. In the future Rifkin lays out, everyone communicates over free and fast broadband. Every house has solar panels that collect and store its own cheap energy. The only vehicles on the road are electric, smart, and driverless. "Sharing" services like Uber and Lyft broaden to encompass material goods from toys to clothing, using less of the earth's resources along the way. Every building, road, and automobile operates as a Big Data center, collecting and distributing information about everything from weather conditions to maintenance needs.

These changes will solve three urgent problems, Rifkin argues. Because this new world is carbon free, it will mitigate the effects of climate change. The need to build a new infrastructure will put "millions of people back to work," he says, and the creation of new, efficient transportation and logistics regimes will jumpstart stalled productivity and spur economic growth.

Rifkin's ideas have gotten a respectful hearing in Europe and Asia, where he has served as an advisor to the European Union and China in formulating plans for carbon-free, automated, digital-forward zones. Rifkin's consulting firm, TIR Consulting, has helped craft China's Internet Plus Action Plan, and the EU's SmartEurope initiative, for example. But he's yet to make much headway with policymakers in the US, and many economists and theorists regard his ideas with skepticism.

"It's a part of human nature that we are excited about the future, and there will always be authors who offer that to people," says Gregory Clark, an economic historian at the University of California, Davis. "Then there are people who have to look at the cold data and actually point out that it can't happen."

But there were few naysayers in the audience when the new documentary was screened at the Tribeca Film Festival back in April. Also titled *The Third Industrial Revolution*—but with the warm-and-fuzzier *A New Story for the Human Family* substituted for the book's tech-speak subtitle—the film is built around Rifkin giving a lecture and fielding questions from an engaged, diverse group of Millennials in a Brooklyn warehouse, supplemented by archival and other footage. It's basically Rifkin's modern version of Futurama. At the festival it worked; the people at the screening—also mostly Millennials—discussed and defended his ideals late into the night at a boozy party. When Rifkin walked into the room, eager fans swarmed him. "I felt like Tony Bennett," he says.

But the audience Rifkin and the documentary's director, Eddy Moretti, are really intent on reaching are decision-makers—specifically the nation's CEOs—in the hope that they will embrace Rifkin's ideas. "We have a list of over 2,000 names we are reaching out to," says Moretti, chief creative officer with Vice Media Worldwide. "The person I want to see it the most is Jeff Bezos. Amazon has such power potential to reinvent a digital, efficient economy." The buy-in of business leaders is especially important in the US, they feel, since, even aside from the continuing paralysis on the issue of climate change, government is still focused on fixing old infrastructure, not building systems for the future. Companies and local leaders will have to take on the job instead.

One company that has signed on is Ford, a sponsor of the documentary and of Vice Impact, Vice Media's advocacy arm that launched with *The Third Indus-*

trial Revolution project. "We're selling cars, trucks, and SUVs, while developing 13 new electric car models, delivering a shared micro-transit service called Charriot in cities, providing a bike share in San Francisco, deepening relationships with cities and with start-ups, and convening conversations to help build a better future," says Carrie Majeske, the company's associate director of global sustainability integration. "Society is in an in-between space right now and needs to have one foot in the second industrial revolution and one foot in the third."

The question is whether enough players can be sufficiently inspired to start building the cities and towns of the future. As Jeff Beer, a journalist who profiled Rifkin for *Fast Company*, puts it: "He has this plan, the ball is rolling in other parts of the world, he has this documentary, but will American business bite, will it buy in? I can only use the worst phrase in journalism: it remains to be seen."

From the day he was born—on January 26, 1945, in Denver, Colorado—Rifkin has been a fighter, against long odds. He and his twin sister were born prematurely, when his mother, Vivette, was in her sixth month of pregnancy. They weighed only about two pounds each, a very dangerous condition at the time. According to Rifkin, they were among the first babies in the US to be treated with penicillin—obtained from a nearby Air Force base—and their survival made the front page of *The Denver Post*.

After they were healthy enough to travel, the family moved to the South Side of Chicago. Rifkin's father, Milton, made his living as the owner of a small factory that made plastic bags for industrial use. The neighborhood was mostly working class, and Rifkin says that 20 percent of his high school class did not even graduate—and no one knew anything about college. He decided where to apply by watching a television show in which smart kids representing different universities competed against each another, he says.

Penn was still a pretty conventional, buttoned-down place when Rifkin arrived on campus in the fall of 1963. Many of the students were affluent and came from prep- or boarding-school backgrounds. They played pinball late into the evening for fun. The doctrine of *in loco parentis* was still in force, and female students especially were affected. "There were visiting hours, and you had to leave the door three feet open so there wasn't any hanky panky," remembers Rifkin, who, according to a 1992 *Gazette* profile, "organized 600 students in a demonstration that helped change visiting-hour limitations for females in the all-male dormitories."

Rifkin thrived in that world, serving as president of his senior class and winning the student Alumni Award of Merit and the Cane Award. He was also vice president of the Inter-Fraternity Council, a member of the debate team, and a Penn cheerleader. (Gender equality only went so far: in that era's debate over allowing female cheerleaders, he pronounced himself "unequivocally opposed in any way, shape, or form" in *The Daily Pennsylvanian*.)

But the divisions of the era were increasingly felt on campus. Opinions on the Vietnam War still varied among students, but more of them were beginning to question it, Rifkin included. Referring to a class on the war, he says, "It was quite surprising to learn that what the government was saying about the war did not jibe with what was actually happening in Vietnam." But his real turning point came when he happened to witness some frat guys beating up war protesters stationed near Van Pelt Library. "This doesn't happen here," he remembers saying.

In April 1967 Rifkin spoke at a rally in Houston Hall plaza at which students aired their views of the war, declaring that it "is the responsibility of concerned individuals to speak out and be counted," according to a report in the *DP*. The rally was part of an effort at campuses across the country to mobilize a nation-



wide protest on April 15, which Rifkin called “the last chance for a large organized effort to change the course of the war before the United States begins to significantly increase escalation in Vietnam.” He also participated in protests against two classified research projects on chemical and biological weapons being conducted at the University, known as Spice Rack and Summit—a controversy that roiled the campus in those years and sparked the first-ever College Hall sit-in, starting on April 26 and lasting three days.

Some classmates and Rifkin’s family warned that getting involved with anti-war and other protests could “ruin [my] life,” he says. But for at least one then-underclassman, the engagement of the senior class president was a source of inspiration.

Freshman Ira Harkavy C’70 Gr’79—who would later become the founding director of the Netter Center for Community Partnerships [see story on page 21]—was among a group of activists meeting at the Christian Association when they were joined by Rifkin, who had left his senior

prom to attend and show solidarity. “Jeremy came in in his tuxedo and said, ‘I’m with you,’” Harkavy recalls. “To have the senior class president do that, it felt like an important indicator of change and something that increased my optimism at the time. I thought it was likely there would be more and more support of the anti-war movement at the University of Pennsylvania.”

After graduation, Rifkin attended Tufts University’s Fletcher School of Law and Diplomacy, earning a master’s degree. He also became more involved in anti-war protests. He joined VISTA—Volunteers in Service to America, the domestic Peace Corps created by President Kennedy—and helped welfare recipients in New York City’s poorest neighborhoods. He went to Woodstock—and got soaked in the rain. “My brand-new sleeping bag was stolen the first night,” he says, laughing. “Someone wanted to share it.”

Rifkin launched his career as a professional activist by founding the People’s Bicentennial Commission, designed to counter the corporatization and com-

mercialization of the nation’s Bicentennial. One of many actions by the group that gives a flavor of its tactics was a protest against President Nixon and the oil companies during the OPEC oil embargo in December 1973 that included dumping empty oil cans into Boston Harbor in mock emulation of the 200th anniversary of the Boston Tea Party occurring simultaneously.

In 1977 Rifkin cofounded the non-profit Foundation on Economic Trends, “to examine emerging trends in science and technology, and their impacts on the environment, the economy, culture, and society,” which is still in operation. Over the next decade, the group produced books, set up transnational coalitions of nongovernmental organizations to work against climate change, and established the Greenhouse Crisis Foundation in the United States to educate parents and students on environmental risks.

When the *Gazette* wrote about him in 1992, Rifkin was riding a wave of media attention around two recent books. *Beyond Beef: The Rise and Fall of Cattle*

Culture was an attack on industry practices combined with an effort to convince Americans to cut their beef consumption by half. *Who Should Play God?* sounded the alarm about the ethics of biotechnology—he opposed genetic manipulation of species, the Human Genome Project, and genetically altered crops and foods. “When you can begin to intervene in the blueprints of life it raises significant ethical, social, and economic questions,” he says now of his interest in the “challenges and opportunities” presented by the “biotech revolution.” To a certain extent, the piece seems to catch Rifkin in mid-transition from pranksterish gadfly—prone to gimmicky PR stunts and filing lawsuits against opponents—to futurist sage.

In the 1992 *Gazette* article he had complained that the University had never asked him back to campus to speak, but in 1994 he began teaching in the Wharton Executive Education program. That association persists: this past summer senior executives participating in the Wharton Fellows program were planning a trip to Shanghai and Shenzhen for *Creating New Growth Opportunities in the Third Industrial Revolution: Lessons from China*, the first of three planned programs on Rifkin’s theories.

The relationships he has made along the way have been vital, he says. “I work with all sides because I grew up with working people, I am an activist, but I also worked and taught at Wharton so I cross into all camps, which is important.”

Rifkin’s books—20 in all, so far—have always tracked the causes he has embraced. Along with *The Third Industrial Revolution*, others key to his current thinking include 2000’s *The Age of Access: The New Culture of Hypercapitalism Where All of Life Is a Paid-For Experience*—which examines the internet-spawned move away from ownership in favor of “‘just-in-time’ access to nearly every kind of service”—and his most recent, *The Zero Marginal Cost Society: The Internet of Things, the Collaborative*

Commons, and the Eclipse of Capitalism, which came out in 2014.

Readers respond to Rifkin’s ability to weave together complex concepts while always bringing the focus back to how the vast technological and social changes he contemplates will play out on the ground.

Rifkin is also able to weave those concepts into a clear narrative. “Everyone talks about the coming digital economy or they talk about climate change and the planet but few people put it together, and that is what I love about what he does,” Moretti says, explaining what appealed to him about Rifkin as the subject for a film. “I bought one book, read it, bought the others, became really interested in them, and had my assistant track down this guy so I could meet him and make a documentary and help him tell his story.”

(“Reading all my books is something my own family doesn’t even do,” jokes Rifkin.)

After Moretti introduced a preview clip of the film at Ford’s “Cities of Tomorrow” symposium held at the 2017 North American International Auto Show in Detroit, Rifkin emerged in person to elaborate on its implications and detail some of his work in Europe and China.

Rifkin told of meeting with German Chancellor Angela Merkel shortly after her election in 2007, and telling her that no social or economic reforms being contemplated would be effective as long as they were built on the assumptions and aging infrastructure of the second industrial revolution. Instead, he said, she needed to take advantage of a “new convergence of communications, energy, and transport to manage, power, and move Germany.” Merkel pledged her government’s cooperation.

Germany has announced plans to generate 100 percent of its power from renewable energy sources by 2050; renewables of all types currently account for approaching one-third of the nation’s capacity. Combine that trend with the curve toward cheaper and more efficient solar power collection and storage—advancing at a rate similar to Moore’s Law

for computing power, Rifkin asserted—and it’s clear that, “This is the sunset for fossil fuels and nuclear power.”

Legacy companies in the energy sector will need to change their business model, looking ahead to a 30 year or so transition in which they will shift from production to providing management services to assist smaller producers. The same choice faces auto manufacturers, who will still sell plenty of cars for a long time but will have to shift focus away from their “car ownership” business toward the “mobility internet” as well, since every car-share eliminates an estimated 10-15 cars from production, he said.

In the case of China, Rifkin’s influence was being felt even before he was aware of it. Chinese Premier Li Keqiang was taken with Rifkin’s plans after being slipped *The Third Industrial Revolution* during a visit to Germany. He read it and was so enthralled that he instructed the central government to begin moving on the themes immediately.

In March 2015, the country released its 13th Five-Year Plan, devoting \$360 billion to investments in renewable energy, followed a few months later by the premier’s announcement of the China Internet Plus action plan. “The action plan will integrate mobile Internet, cloud computing, big data and the Internet of Things with modern manufacturing, to encourage the healthy development of e-commerce, industrial networks, and Internet banking, and to help Internet companies increase their international presence, Li said,” according to a release from China’s Xinhua news agency.

While he won’t reveal names, Rifkin insists other leaders have already commissioned his help to transform their countries or companies. “You will see this in other places in the next few years,” he says.

But how about the United States?

He hopes the increased visibility of the documentary will help make further inroads, if not with the current generation of leadership then the one coming up. He says he’s been approached in the past by

documentary filmmakers, and always turned them down. He accepted Vice Media's request because the company's big reach—135 million viewers in 2016—made it an ideal platform from which to build momentum to enact change. At the premiere of the film at the Tribeca Film Festival, he encouraged the Millennial audience to pressure their local lawmakers to enact change. "My hope is the mayors and county commissioners and local chambers of commerce will move forward and respond to and start grassroots movements," he said.

Rifkin also seems to regard the Millennial generation as uniquely able to sympathize with his ideas and push the agenda of the third industrial revolution forward. "I'm putting my faith in the Millennials," he says. "We have to make sure this doesn't get lost because there won't be a second chance."

It also helps that many of the innovations Rifkin is talking about implementing—self-driving trucks, solar-powered buildings, automated traffic systems—are already a reality. "There is only so much audience for ideas when they seem so way out on the horizon," says *Fast Company's* Beer. "The most effective thing you do is point to an example and say, 'It's real.' You can point to a YouTube video of a driverless truck and say, 'This is it. It's happening. We are already there.'"

Innovations in communication have also primed people to want technological innovations in other areas, adds Moretti. "We have this very fancy communications infrastructure while everything else, our transportation and logistics regimes, are from during the last industrial revolution."

These new technologies are also becoming affordable, according to Wolfram Schlenker, a professor of environmental and natural resource economics at Columbia University. "There are some people who are very bullish about the breakthroughs of new technology," he says. "The costs have come down much faster than people have anticipated."

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And once the infrastructure for solar energy and wind energy are in place, for example, marginal energy costs should plummet. That will incentivise other companies to get on board. "If you are in business you want to make money and your margins are being squeezed by energy costs, you are screwed," says Beer.

"The sun has not sent us a bill. The wind has not invoiced us," Rifkin said in Detroit, summing up the economic impact of the move to renewables. "How does a second industrial revolution country compete?"

But other economists crunch the numbers and say yes, sustainable, carbon-free systems are getting cheaper, but they are not cheap enough yet for any rational player to switch. New sources of energy will only depress demand for oil, driving prices down to a point no one can ignore. "I'm skeptical that when push comes to shove, countries will make really big changes," says Clark.

He points out that even countries that claim to be committed to renewable energy still have one foot in oil. "Canada is pro renewable energy, but it still wants to exploit the Tar Sands," he points out.

"It's encouraging that China is moving towards renewable energy, but it's still true that China is a major issuer of carbon pollution in the world."

Clark is also skeptical of Rifkin's claims that the third industrial revolution will increase productivity by all that much. "It's unusual for social changes to occur that rapidly," he says. "Even in the time of Henry Ford, things were changing fast, but income per person was only going up two percent a year." Clark's own research suggests, contrary to conventional wisdom, that social mobility has been constant—and excruciatingly slow—for basically forever, and it has been largely unaffected by economic system, increasing democratization, mass education, or any other external factor.

And he cites economists like Northwestern University's Robert Gordon, who contends that digital-era advances pale in comparison to key 19th and 20th century inventions like the electric light, internal combustion engine, and telephone/radio/TV in their ability to transform economic life for the better. Over a million people have watched Gordon's TED talk lecture, "The Death of Innovation, the End of Growth," on YouTube, in which he argues that the diminished impact of innovation, combined with "headwinds" in demography, education, inequality, and national debt, will lead to slow or no growth in US living standards in the future.

Rifkin knows the criticisms and the many challenges ahead. "I will have more failures than wins, more defeats than victories," he concedes. But he also is convinced that if no one offers a vision of what can be, there is no way society will ever move forward.

"We have to have someone like General Motors who puts it together for people," he insists, harking back to "Futurama" at the 1939 World's Fair. "There has to be someone to set up the next revolution."

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