



CAPITAL INSTITUTE

FIELD GUIDE TO INVESTING IN A REGENERATIVE ECONOMY

THE NEXT (REGENERATIVE) INDUSTRIAL AGE



THE STORY OF

The National Manufacturing
Renaissance Campaign

THE NEXT (REGENERATIVE) INDUSTRIAL AGE

The Story of the
National
Manufacturing
Renaissance
Campaign

*Forging new strategic
public-private partnerships
in support of the
regenerative role
manufacturing must play in
the next industrial age.*



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FIELD GUIDE TO INVESTING IN A REGENERATIVE ECONOMY



AN INVITATION TO JOIN IN THE FIELD GUIDE STORY

*This is Capital Institute’s first **Field Guide to Investing in a Regenerative Economy** eBook. Two years ago Capital Institute embarked on the Field Guide project to create an ecosystem of stories about real-world enterprises that represent the emergence of a new, “regenerative” capitalist system. We are using the enhanced eBook format to enable you to engage in a more immersive way in the regenerative economy storytelling experience.*

We invite you to view videos interspersed throughout the book, where Manufacturing Renaissance Campaign stakeholders speak directly to you about their experiences and challenges. Enjoy the virtual galleries of still photography that capture both the darker side of deindustrialization, as well as the more optimistic, pivotal moments in the lives of the teachers, leaders, students, and manufacturing partners of the Manufacturing Renaissance Campaign. By tapping the bottom of your screen, then this icon that will appear in the upper left corner, you can return at any time to the table of contents to browse chapters that you find of special interest or to view a directory of the enhanced content. Also, please visit [Latest News](#) for periodic updates to this eBook.

Most importantly, we want to hear from you. Please use the hyperlink below to share your ideas and comments. It is our invitation to you to participate in the unfolding story of the regenerative economy.

—Susan Arterian Chang, Field Guide Project Director, October 2012

IMAGE contents.1
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The Field Guide to Investing in a Regenerative Economy is a storytelling initiative of [Capital Institute](#).

Founded in 2010, Capital Institute is a non-partisan collaborative space whose mission is to drive the transformation of finance to serve the emergence of a regenerative and thereby sustainable economy. The organization's founder and thought leader is John Fullerton, a former managing director with JPMorgan whose two decades of experience and expertise in the financial system combined with a holistic understanding of ecological systems have established Capital Institute as a unique and essential voice in the new economy movement.

The organization's goal is to pioneer a new understanding of wealth that extends beyond financial capitalism to a new form of "regenerative" capitalism grounded in an understanding of, and respect for, the finite boundaries of the planet.



MANUFACTURING IN THE AGE OF THE ANTHROPOCENE



I worked on Wall Street during the height of the leveraged buyout era. At the time we viewed the LBO strategy as making a generally positive contribution to the American economy. The LBO pioneers were taking sleepy, undermanaged companies, with underutilized assets and efficiencies not exploited and, by adding debt to their balance sheets and sometimes new management, the buyout firms believed they were making these companies more competitive in the global economy and creating attractive returns for investors in the process. There were seeds of truth in that thinking, but also self-interested rationalization and callous greed. Twenty-five years later, however, we know the extent to which the LBO phenomenon contributed to the decline of the US manufacturing sector.

We now see a new role for manufacturing in the [Age of the Anthropocene](#). We know that a material intensive industrial economy accelerates the natural entropy that occurs on the earth as it uses up raw materials, consumes energy, and creates waste byproducts during the production process and at the end of product lifecycles. The challenge now is to

sustain our economy while at the same time minimizing that [natural entropy](#)—a concept we call “entropic thrift.” [The National Manufacturing Renaissance Campaign](#), will, I hope, be at the leading edge of shifting our manufacturing sector to one that is very thrifty in the use of materials and energy. Knowing how to do that well will be a value-added process that should generate good jobs, good incomes, and real wealth for the people and businesses that participate in the transition to an economy that operates inside planetary limits.

—John Fullerton, Founder and President, Capital Institute

ENVISIONING A REGENERATIVE ROLE FOR MANUFACTURING



MOVIE 1

Dan Swinney and John Fullerton share their perspectives on the leveraged buyout era and its consequences for American manufacturing.

ENVISIONING A REGENERATIVE ROLE FOR MANUFACTURING

After bearing witness over the past three decades to a relentless stream of plant closings, jobs off shored, and communities devastated by industrial accidents, it is little wonder that Americans are likely to describe what they once considered their vibrant domestic manufacturing economy in three words: dirty, dangerous, and dead-ended. Over those same decades the [Center for Labor and Community Research](#) and its visionary founder Dan Swinney have been studying the root causes of manufacturing's fall from grace. What they began to chronicle, beyond the obvious globalization pressures, was the untold story of how small- to medium-sized private companies with succession issues were falling victim to Wall Street's LBO engineers. Equally troubling was what they uncovered of the public sector's (and in particular, public education's) failure to respond to the changing nature and requirements of American manufacturing.

At the same time CLCR has been attempting to frame a discussion around the regenerative role manufacturing can and must play in a new industrial age. CLCR's initiative, the

Manufacturing Renaissance Campaign (MRC) development model, pioneered in Chicago and now scaling up into a national effort, is forging partnerships among leaders of government, organized labor, public education, the private sector, and civil society who have put their differences aside to rally around a shared belief: that manufacturing, in its current advanced evolution, can and must be mobilized to restore the damaged societal and biophysical systems that represent the dark side of its legacy. If they succeed, these unlikely collaborators may well help catalyze what Marjorie Kelly, author of **OWNING OUR FUTURE**, maintains is the critical transition our economy must make from "extractive" to "generative" forms of corporate ownership.

WHAT REALLY CAUSED THE DECLINE OF AMERICAN MANUFACTURING

Dan Swinney is a pragmatic thinker and doer whose knowledge of the manufacturing sector is grounded in a decade's worth of work on the factory floor and three more as an industry analyst and consultant. After studying history at the University of Wisconsin, he left Madison in 1968 to work as a turret lathe operator and union organizer at a succession of Chicago area manufacturers. In 1975 Swinney was hired at the pipeline fabricator Taylor Forge shortly after Gulf + Western acquired it in a leveraged buyout. Taylor Forge had been a classic example of the old manufacturing model before Gulf+Western acquired it. "Mr. Taylor was an engineer who invented a lot of the equipment we used in the factory," Swinney recalls. "He had a long-term vision for the company, and a decent relationship with the workforce."

In 1967, reaching retirement age without a family member to succeed him, Taylor sold out to Gulf + Western. G+W management quickly began to close down departments in wave after wave of cost cutting. In 1982 management informed employees that if they wanted to keep their jobs



Dan Swinney in his Chicago office.

they should consider agreeing to pay cuts and reduced pension benefits. In 1982 Taylor Forge's Cicero plant was closed and Swinney was out of a job.

Sensing that something hugely destructive was happening to America's industrial base Swinney decided to apply his

historian's perspective and analytical skills to addressing it. In 1982 he founded the Midwest Center for Labor Research (MCLR), where he and his colleagues began to explore the emerging crisis in manufacturing and strategies for regenerating the sector.

While globalization had contributed new competitive cost pressures to American manufacturing, the industry response, fueled by Wall Street short-termism, had largely been simply to outsource and cut costs rather than reinvent the manufacturing model. While this made sense from the narrow, capital efficiency perspective of the engineers of leveraged buyouts, it was to have extremely negative consequences for the industry, the nation's economy and the American middle class.

Beginning with a study of 800 manufacturing companies in the Chicago area, MCLR began to observe a close linkage between the issue of succession and companies' vulnerability to takeover. In the case of many small manufacturers, mostly white-owned, the owners had moved out to the suburbs and their children had chosen careers in the booming financial services sector. When the owners were ready to retire their

children were unwilling to return to the inner city to run the family business. As often as not, MCLR's research uncovered, it was a crisis of ownership rather than a crisis of competition that led to the demise of many American manufacturing companies.

LBO mania had spread virally throughout America's manufacturing landscape beginning in the 1970s. It was a pattern that was to repeat itself again and again—public companies borrowed heavily to purchase undervalued corporations, stripped out and sold their assets, and eventually disinvested. While in the past a manufacturing company might typically reinvest eight percent of its gross sales into research and development to ensure its long-term viability, companies like Gulf + Western, seeking to optimize near-term capital efficiency, were more likely to plow back only a small fraction of that percent into the companies they acquired. As Swinney reports, "it was a short-term strategy—buy a car and never change the oil—that began to dominate every aspect of our business culture."

The myopic, finance-driven response to globalization that dominated the manufacturing sector led inevitably to the off

shoring of thousands of manufacturing jobs and a wave of plant closures in Chicago and throughout the Midwest. In the last two decades of the twentieth century Chicago lost approximately 4000 of its 7000 factories. Swinney's research concluded

that the overwhelming majority of those operations could have survived had labor, government, and the private sector worked more collaboratively and more entrepreneurially to save them. "There were solutions well within reach and they did not require massive subsidies," Swinney maintains.

THE RISE OF FINANCIAL CAPITALISM ... THE DECLINE OF AMERICAN MANUFACTURING



Globalization is only part of the story. LBOs were responsible for the **elimination of 80,000 manufacturing jobs** in the Chicago area during the 1980's. (Center for Labor and Community Research)

"The whole business was about maximizing debt, **extracting** cash, cutting head counts, **skimping** on capital spending, outsourcing production, and dressing up the deal for the earliest, highest-profit exit possible."—*David Stockman*

Particularly vulnerable to the **LBO engineers** were **small, healthy private corporations** that had failed to plan for succession.

Nationally, about **4.5 million** manufacturing jobs, representing 24 percent of the manufacturing labor force, were lost between 1980 and 2005. (Brookings Institution)

TESTING BUYOUT STRATEGIES TO SAVE SMALL MANUFACTURERS

In an earlier Field Guide study, we featured the **Evergreen Cooperatives of Cleveland**, an initiative modeled in part on the [Mondragon Cooperatives of Spain](#). Mondragon, which currently employs 83,000 workers, generates €15 billion in sales, and operates 281 companies worldwide, figures again in the story of the Manufacturing Renaissance. When MCLR began to take an active role in efforts to save small local Chicago manufacturers in the 1980s, Swinney, who had earlier made a close study of Mondragon, advanced the idea that cooperative buyouts could be a viable alternative for companies facing succession challenges. At the time it was not a view that many in the labor movement shared. “In those days a lot of people in the movement felt that workers would somehow be contaminated if they managed a company,” Swinney recalls. “That is why the example of Mondragon was so important—it represented large-scale employee management guided by a different set of values.”

MCLR tested the cooperative buyout strategy in 1986 with Bankers Print, a small, full-service printing company located

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....a Capital Lab Initiative

FIELD STUDY No. 2:

THE
EVERGREEN
COOPERATIVES



The great challenge before us is to unlock the human creative potential for hundreds of place-based Evergreens to flourish, thereby restoring much needed resiliency to our economic web.



Evergreen Cooperatives Field Study

We are constantly told that we live in a competitive global economy, and it's true. But it's not the whole truth. We actually live in a complex global-regional-local economic web with often opposing pressures and objectives. The interplays inside this web are far more nuanced than conventional economic wisdom suggests.

The exercise of free trade suits the interests of politically influential global corporations and their shareholders whose capital moves across borders without restraint to exploit local competitive advantages, most notably labor costs and more lenient environmental regulations. In the name of global efficiency they have often contributed to heightened social injustice abroad, further degraded the global ecosystem, and sacrificed domestic economic resiliency.

The conceivers of the Evergreen Cooperatives see the challenge of economic development and sustainable prosperity differently, through the lens that renowned urban activist and unconventional economist Jane Jacobs articulated so well, identifying cities rather than nations as the core organizing instruments of economies, and drawing parallels between healthy, place-based economies and healthy ecosystems. Central to Jacob's framing is the resilient demand creation of local anchor institutions—the hospitals, universities, and government agencies that all have a strategic long-term interest in the health of their local communities. The properly harnessed energy of these anchor institutions is a vital source of resiliency in place-based economies. And resilient place-based economies provide the strong foundation that is the necessary pre-condition for successfully engaging in the competitive global economy.

Our economic system's drive for efficiency has achieved much, but has also resulted in a host of unintended consequences—chronic underemployment, financial distress, declining health, and erosion of community. We must begin to invest instead in resiliency, and would do well to study, in depth, the holistic elegance of the Evergreen Cooperative's approach to it.

Investing in a resilient economy means investing “upstream.” Capital does not naturally flow upstream, but like the nutrient restoring activities of the salmon teach us, investing upstream is essential to restore and retain system health. After 200 years of pressing for greater and greater efficiency, it is time we initiate a strategic shift on a massive scale.

—John Fullerton,
Founder and President, Capital Institute

Field Study No. 2: EVERGREEN COOPERATIVES www.cnnitalinstitute.org 1

GALLERY 1

THE EVERGREEN COOPERATIVES FIELD STUDY

on the South Side of Chicago that at the time employed 25 workers. It was an all-too-familiar story. The company's

THE **UNTOLD STORY** OF THE SMALL AMERICAN MANUFACTURER

of the nation's **286,000 manufacturers**, approximately **160,000** employ less than **100 workers**.

(Manufacturing Institute)



These **private companies** represent **economic anchors** in their communities

They are particularly vulnerable to succession challenges and to **a broken public education pipeline.**

owner, Carl Wilson, had fallen ill with no family member willing to take over the helm. “We asked him had he ever considered selling to employees,” Swinney recalls. “Then we talked to the workers and demystified the employee buyout process for them.” With a \$50 contribution from each employee and a \$5000 grant from the City of Chicago, MCLR conducted a feasibility study for the buyout. The workers’ group ultimately offered \$250,000 for the company, a bid Wilson eventually accepted.

Not every attempt by MCLR to bring a company back from the brink was equally successful, however. Later, in 1994, MCLR was retained by a Teamsters Local to formulate a strategy to save the jobs of the workers at the E.J. Brach Candy factory, a company located in an inner city neighborhood employing 3700 people, that was threatening to close its Chicago operations. Working with the company’s former CEO, MCLR formulated a plan to purchase the factory. “If the deal had gone through the company could still be open today,” says Swinney, “but the principal shareowner refused the offer.” The Chicago plant closed soon thereafter and was relocated to Mexico.

ARTISTS OF THE FIELD GUIDE: ROBERT R GIGLIOTTI



GALLERY 2 ROBERT R GIGLIOTTI'S PHOTOGRAPHS OF ABANDONED BRACH CANDY FACTORY.

Brach's east and west towers



Click here for a link to the [artist's commentary](#).

CLCR RESEARCH ILLUMINATES SYSTEMIC FAILURE

As MCLR continued to gain clarity on what ailed the manufacturing sector it became apparent that it was infecting the American economic, social, and environmental landscape at the deepest level. Deindustrialization was hollowing out once vibrant, middle-class manufacturing communities leaving chronic unemployment, brownfields, and a host of social ills in its wake. In 1999 MCLR underwent a name change to the Center for Labor and Community Research (CLCR) to reflect a more ambitious mission.

In 2001 CLCR published [“Creating a Manufacturing Career Path System in Cook County](#), an in-depth investigation of the failure of public education to create a pipeline of workers with the requisite skills for employment in the complex, technology-driven American manufacturing sector that had survived the off shoring of low-wage, low-skilled industrial operations. Due to a combination of baby boomer retirement and company growth, the report uncovered, 10,500 high-skilled manufacturing jobs were at the time on offer in the county paying on average \$65,000 a year. However, more

CLCR saw the failure of the public education system to create a pipeline for jobs in advanced manufacturing as a canary in the coal mine, symptomatic of government’s abdication of its responsibilities to the general welfare, just as the financialization of the industrial base represented a corresponding abdication by the private sector of its responsibility as steward of the real economy.

than half of those were unfilled for lack of qualified candidates. Many Chicago manufacturers had resorted to recruiting workers from Eastern Europe to keep their factories running. “So you had PK Tool on Chicago’s West Side looking for a mold designer to do complex stampings, willing to pay \$50 an hour plus benefits, but they couldn’t find any local talent to fill the job,” says Swinney. “Five blocks away you had kids literally dying on the streets with no jobs or working minimum wage at McDonalds or Walmart or in the underground economy.”

This systemic dysfunction was not unique to Cook County in 2001, nor is it today. According to the [Manufacturing Institute's 2011 Skills Gap Report](#), 600,000 positions in the manufacturing sector are going unfilled due to an inadequate pipeline of skilled workers. "It used to be that both large and small American companies provided formal apprenticeship programs in theory and practice and schools would gear students up for those jobs," reports Bruce Braker, Executive Director of Chicago MRC. "But most of those technical high schools were long ago converted to college preparatory schools and students are no longer getting introduced to careers in manufacturing." This demand/supply disconnect represents perhaps one of the greatest threats to the future of American manufacturing, in the view of companies surveyed by the Manufacturing Institute.

The crisis has garnered little public attention until recently, perhaps because it has impacted small manufacturers much more so than larger ones. "Eighty percent of precision manufacturing is done in small, family-owned businesses employing fewer than 100 people and there are thousands of them in many communities across the US hidden in plain

sight," says Jim Wall, executive director of the [National Institute for Metalworking Skills](#). Indeed, according to a [2009 Manufacturing Institute study](#), of the nation's 286,000 manufacturers, approximately 160,000 employ less than 100 workers. Those small companies represent some of the most deeply rooted anchor institutions in their communities. They neither have the option nor the inclination to pick up and move operations in search of skilled labor like larger corporations do. This makes them extraordinarily dependent on a responsive and well-functioning local public education system for their survival. And that system has been failing them for many years.

The old social contract between the private and public sector was predicated on the owners of capital nurturing America's real productive capacity, labor bargaining for its portion of the wealth created, and government attending to the nation's infrastructure and the general social welfare through its taxing authority. CLCR saw the failure of the public education system to create a pipeline for jobs in advanced manufacturing as a canary in the coal mine, symptomatic of government's abdication of its responsibilities to the general

welfare, just as the financialization of the industrial base represented a corresponding abdication by the private sector of its responsibility as steward of the real economy.

Read what Nisha Mistry, manufacturing adviser to the city of Newark, says about the vital role of small manufacturers and a skilled manufacturing workforce in a resilient economy.



GALLERY 3 NIMS CREDENTIALING

A student taking the National Institute of Metalworking Skills (NIMS) credentialing examination. Metalworking companies use NIMS credentials to recruit, hire, and promote employees.

A DEMAND/SUPPLY JOBS **DIS**CONNECT

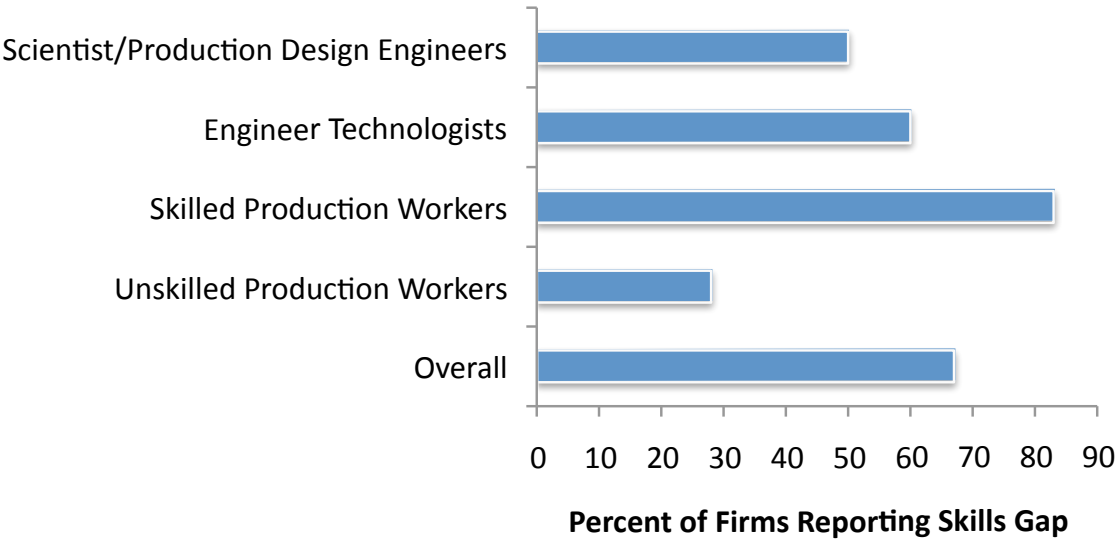
Public education

has **failed** to create
a pipeline of skilled workers
for the manufacturing sector.

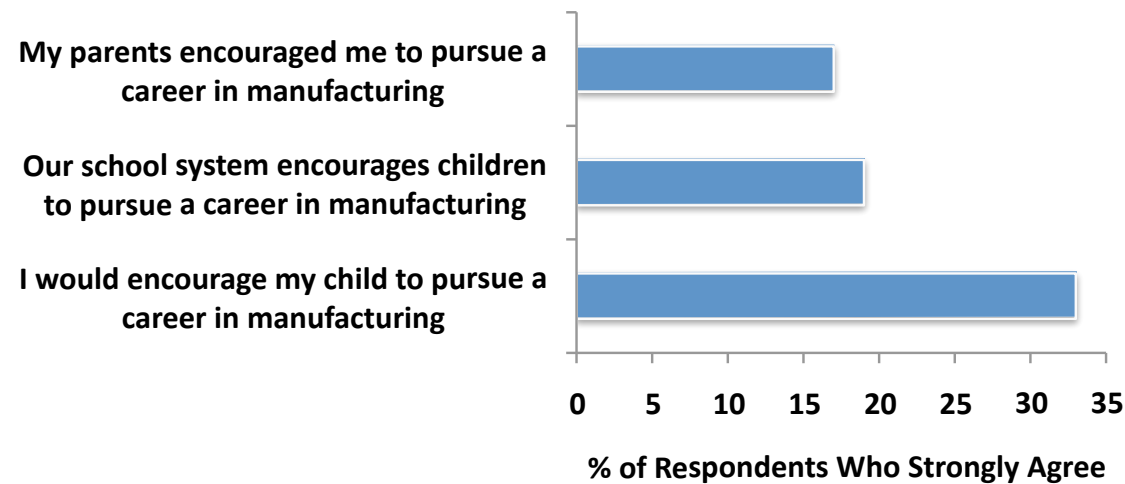
Today, **600,000 jobs**
in the American manufacturing sector
are **unfilled**
due to an inadequate pipeline of skilled workers.



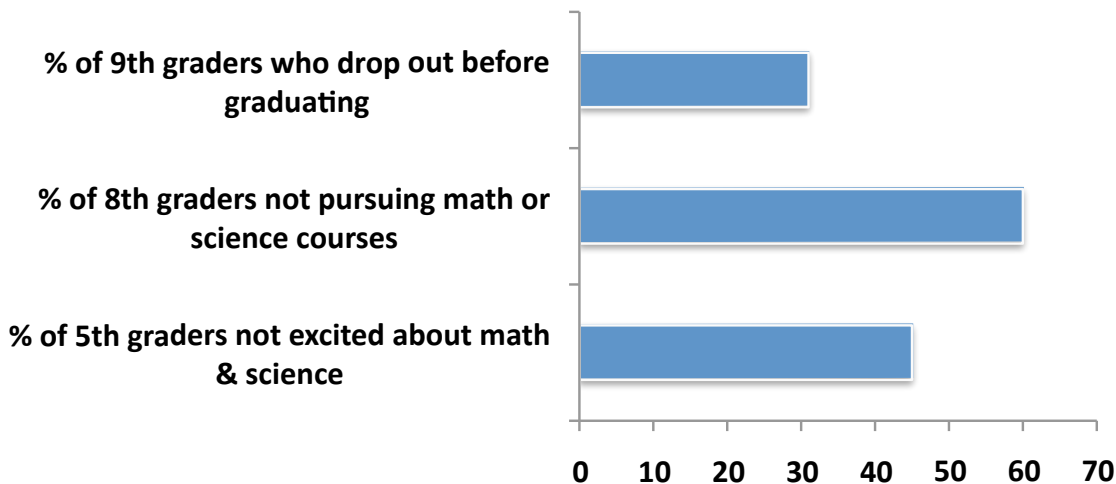
U.S. Manufacturing Skills Gap Crisis



Students Not Encouraged to Pursue Manufacturing Careers



Early on Students Report Lack of Interest in Math & Science



(Data Source: Manufacturing Institute)

HIGH ROAD STRATEGY EMERGES FROM UNLIKELY PARTNERSHIPS



MOVIE 2

Dan Swinney and Jorge Ramirez talk about the qualities of a high road company.

HIGH ROAD STRATEGY EMERGES FROM UNLIKELY PARTNERSHIPS

“The high roaders are those who read Adam Smith’s Theory of Moral Sentiments and The Wealth of Nations and the low roaders are those who read only The Wealth of Nations. You are supposed to read both and to understand that capitalism is not just about self interest but the betterment of society.”

— Edward Hamburg, an operating partner at Morgan Stanley Expansion Capital and CLCR director

Early on CLCR realized that to recast American manufacturing in a new, regenerative mold would require a new social contract with new, more collaborative roles assigned to a broad range of public and private sector, formerly adversarial, stakeholders. So CLCR welcomed the enthusiastic response to its Cook County study—which had in fact been sponsored by the [Chicago Federation of Labor](#)—from a politically right-of-center and decidedly anti-labor organization, the [Illinois Manufacturers’ Association](#). Many of the organization’s 4,000 members

were living the workforce crisis the Cook County study had described. “They told us, ‘you are speaking about the realities of our members,’” recalls Swinney.

Seizing the opportunity to forge what it knew would be an unlikely collaboration, CLCR spent the following few years meeting with the leaders of the Board of the Illinois Manufacturers’ Association and the Chicago Federation of Labor to talk about what it would take for them to work together toward a common goal: shoring up Chicago’s manufacturing sector. In 2005, after recruiting a wider group of small manufacturers, industry trade organizations, and government and civic leaders, the [Chicago Manufacturing Renaissance Council](#) (MRC) was founded to address the Chicago area’s advanced manufacturing workforce crisis. The Chicago MRC was to be grounded in what CLCR called a “high road” strategy.



Photo credit: Peter Le Grand

A white paper published in 1998 by CLCR, [“Building the Bridge to the High Road,”](#) had described how the American industrial economy had been compromised by “low-roaders” driven by short-termism, greed, and narrow self-interest. “High roaders,” in contrast, the paper suggested, would deploy human and material resources in the service of the common good and longer-term societal goals. The paper also called for a recasting of traditional roles. Labor, for example, was called on to focus not only on the redistribution of wealth but also on wealth creation, in a peer relationship with the owners of capital. “We were careful to frame the discussion in terms of the high road versus the low road, not anti- or pro- corporate or anti- or pro- union,” says Swinney.

"We are seeing the beginning of a public/private movement that seeks innovation and development in manufacturing as the means to promote a sustainable and restored society. This movement seeks to reverse the impact of the first industrial era on the environment with a focus on renewable energy, new sustainable processes through chemistry, bio and nano technology."

— Dan Swinney

A POLYTECHNICAL CAREER PROGRAM INCUBATES IN INNER CITY CHICAGO



GALLERY 4

The Austin Polytechnic Career Program operates under a “performance school” model rather than a charter or contract school.

A POLYTECHNICAL CAREER PROGRAM INCUBATES IN INNER CITY CHICAGO

Despite their differences, it took Chicago MRC partners little time to reach a consensus that the advanced manufacturing sector in Chicago could not long survive in the absence of a pipeline of skilled individuals to replace its retiring baby boomer workforce. Establishing a new secondary school in Chicago grounded in a rigorous science, technology, engineering and math (STEM) curriculum became the organization's first formal project. The plan was to augment this rigorous curriculum with a manufacturing-focused polytech career program that would expose students to every aspect of the local manufacturing industry. Students would graduate with the academic and real-world skills required to secure high paying jobs in advanced manufacturing. They would also be encouraged to aspire to further advance themselves through education and on-the-job training for careers in engineering, management, and ultimately ownership of local manufacturing companies.

The Chicago MRC chose the “performance school” model rather than a charter or contract model to enable it to partner

with the Chicago Teachers Union while ceding management of day-to-day operations to Chicago Public Schools. The aim was to influence the public secondary school curriculum and grow a new model within the existing system rather than take full responsibility for all aspects of school operations. As the Chicago MRC's managing partner, CLCR would manage the polytech career program including fund-raising, staffing, and day-to-day operations.

Arne Duncan, who was then CEO of Chicago Public Schools, challenged the Chicago MRC to build the school in Austin, an impoverished west side community that had been a victim of deindustrialization. “It was a key strategy to create a link between the inner city and the companies that had unfilled workforce demand,” says Swinney. “We committed to filling the companies' needs and in return the companies had to accept our social terms. They were not in this for charitable reasons. They were desperate for the work force of the future.”

OVERCOMING A COMMUNITY'S SKEPTICISM



MOVIE 3 THE INNER CITY

Why the Chicago MRC decided to locate its polytechnic school in an inner city neighborhood victimized by deindustrialization.

OVERCOMING A COMMUNITY'S SKEPTICISM

Chicago MRC's attempt in early 2007 to recruit the first freshman class of [Austin Polytechnical Academy](#) was a challenge. "We still battle a perception issue, especially in the African American community, that you are steering people into low paying jobs, and it is a valid concern. Austin has experienced divestment for decades and people had been made many promises but never saw the benefits," says Amara Enyia, CLCR's former policy director. "So there was a lot of skepticism and a sense of, 'do we really want to hang our hats on this?' We had to work hard to coax people along and be transparent and demonstrate that this school could genuinely transform the lives of individuals and the community."

Austin's 7 square miles had once been home to 20,000 manufacturing jobs. Now only 2,000 remained. According to the latest US census data, 19.3 percent of Austin's labor force is unemployed, and almost 30 percent of residents live below the poverty line, including 41 percent of those under age 18. Austin parents had to be convinced that there were high paying, high-skilled jobs waiting for their sons and daughters

in the new world of advanced manufacturing. "We had to let members of the community know that the new manufacturing jobs in the United States were not like the old ones," reports Braker. "They had to understand that while the old repetitive manual work had disappeared it had been replaced by robotics that required advanced skills to run automation equipment."

"People are coming to understand there is nothing wrong with working hard and using your hands. We need to stress the dignity of all workers. We need to place people in jobs where they will find peace and joy in what they are doing. We want to give people opportunities to find fulfillment in their jobs and we think manufacturing is the place they can find it."

*—Bart Aslin, CEO, Society of Manufacturing Engineers
Education Foundation*

AUSTIN'S PUBLIC-PRIVATE PARTNERSHIP IN ACTION



Bill Vogel, Austin Polytech's industrial coordinator, sets the bar high for both APA students and the school's private sector partners. Both are expected to deliver on the promises they make.

AUSTIN'S PUBLIC-PRIVATE PARTNERSHIP IN ACTION

APA's Polytech Career Program is closely modeled on current practices in Germany, Denmark, and Spain where companies provide students with early exposure to the real world of manufacturing and an opportunity to advance after they graduate through both on-the-job and formal academic training. Schools in turn are responsible for providing students with the requisite polytechnic skills that will allow them to begin to make a meaningful contribution to the manufacturing workforce immediately upon graduation.

A team of CLCR-trained staffers recruit manufacturing companies to the Polytech Career Program, administer it, and ensure that both students and companies fulfill the terms of the partnership. The day we visited Austin Polytech, Bill Vogel, the school's impassioned industry coordinator and the former owner of a Chicago die casting firm, reported that the next morning representatives of four companies would be arriving at the school to escort students out to their factories for a day of job shadowing.

Vogel sets the bar high for students in the Career Program. He expects them to maintain their grades and show up for school on time every day. He believes, however, that the sky is the limit for those students who live up to his expectations. In his 52 years in the manufacturing sector, he reports, he has never seen more career opportunities for young people than he is seeing today.

While he demands much of his students, Vogel is equally protective of them. After speaking with us he was leaving to visit a partner company that had hired an Austin graduate, but was not delivering on its promise to support the student's post secondary school education. "We are into uncharted waters on both the education side and the manufacturing side," says Vogel. "Manufacturers have to understand when they hire a person they have a responsibility to enable that person to go forward for their college career."

Marquiese Booker became one of the first 11 APA students to earn two NIMS credentials. He applied and was hired for his first summer manufacturing job at Laystrom Manufacturing in 2010, arriving every day for eight weeks every morning at 5. By January of 2011, Laystrom had decided to create a Quality Control Technician position specifically for Marquiese. Marquiese worked until the fall of 2012 as a full-time employee on a career track at Laystrom but was recently laid off as Laystrom experiences the continuing impacts of the recession. Marquiese remains optimistic and is looking for another job with the support of Austin Polytech's Industry Coordinator Bill Vogel. In the meantime he is planning to enroll at Chicago State to study mechanical engineering.



SETBACKS AND SUCCESSES



MOVIE 4

Austin Polytech Career program “pulls at different parts” of students’ brains and inspires them to be leaders in their community’s redevelopment.

SETBACKS AND SUCCESSES

The Austin Polytech Career Program has encountered its share of setbacks over the course of the last five years. For example, early tensions with Chicago Public Schools resulted in three changes in the school's administration. Like many other inner city schools, Austin Polytech has struggled to meet academic performance standards, since its entering freshman class typically performs below grade level on standardized math and reading tests and students are often burdened with other special needs.

“We could have started this school in the suburbs and had an easier time but our commitment to manufacturing is also a commitment to end poverty and to develop communities that were devastated by deindustrialization,” says Swinney. “So even though Austin presented a lot of challenges, we went there out of principle.”

The challenge of taking entering freshman and moving them up to meet what is essentially an honors math and science curriculum doesn't happen overnight. Experiential learning

drives the process. Students spend time in a calculus or engineering class and then get to apply the theory to practice in the school's machine shop or as an intern at a local manufacturer. ““What I was beginning to see were students grabbing hold of what they were learning in math and sciences and opening up their eyes to the engineering world,” Pete Schoedel, Austin Polytech's former engineering teacher, reports. “What does it mean to design and build something? When they go see a manufacturing plant and do a tour they begin to fit those pieces together.”

Steven McIlrath, APA's mathematics teacher, was initially skeptical of the Polytechnic Career Program out of concern that it would discourage students from aspiring to a liberal arts college education. He has since changed his mind and is one of the program's most enthusiastic supporters. “Instead of trying to force our kids into one track or another we let our kids really be poly in their education and have this complicated education that pulls on different parts of their brain,” he maintains.



Desiree Wordlaw
Student
Austin Polytechnical Academy

MOVIE 5

Pablo and Desiree Wordlaw talk about hands-on learning at Austin Polytech and Torres Hughes describes the connection between APA and the Mondragon Cooperatives.

In 2012, APA graduated its second senior class of 58 students, almost all of whom plan to attend college. Nearly 90 percent of the class has already earned at least one National Institute of Metalworking Skills (NIMS) credential, which directs them into the advanced manufacturing career pipeline. Twenty percent were either offered jobs in manufacturing upon

graduation or are attending colleges with the intention of later pursuing manufacturing or engineering careers.

The ultimate goal of the Austin Polytech Career Program is to inspire students to see themselves as leaders and change agents in their own communities, whether or not they ultimately work in the manufacturing sector. Lucia DeLeon, the program assistant for CLCR's Polytech Career Program and the parent of two girls who attended Austin Polytech, has a wish of her own—to see one of the community's shuttered factories

reopened by an Austin Polytech graduate. "There are a lot of foreclosures and empty factories in Austin and a lot of our kids want to leave it behind," she notes. "We want them to stay, and reopen the old factories as owners. It would be so good if we could have a few of our students do that."

ARTISTS OF THE FIELD GUIDE: PETER LE GRAND

Peter Le Grand, Sr., the father of a former Austin Polytech teacher, photographed the students who appear on this page, as part of a larger commemorative project. Most of the photographs were taken in the auditorium at Austin.

“When we started to talk about the project I realized that there were three groups of people involved in the school and that all three needed to be honored,” says Le Grand. “The students constituted one group, the teachers and staff another group, and the manufacturing partners and community leaders a third group. The one piece that struck me about this entire project was the dedication of the teachers, staff and students and the boundless faith that this project would be successful. When you see the enormous poverty in the neighborhood you wonder how anything can be successful, but these three groups banded together and made it happen.”

These wonderfully evocative portraits capture Austin students’ growing sense of pride and possibility, as well as a seriousness of purpose.



GALLERY 5 PORTRAITS OF PRIDE, POSSIBILITY, AND PURPOSE.
Credit: [Peter Le Grand](#)

OWNERSHIP MODELS INFUSED WITH DEMOCRATIC VALUES

The day that Austin graduates reopen a shuttered factory in their neighborhood may come sooner than expected. Last year, the Society of Manufacturing Engineers Education Foundation contracted with the Austin Polytechnic machining program to make 500 whistles. Five APA seniors were tasked with creating a business model to cost out, price, and manufacture the whistles.

It is envisioned that among Austin Polytech graduates some will eventually become owners of manufacturing start-ups, others will succeed an older generation of owners of mature companies, and yet others will participate in buyouts that involve some form of worker ownership. “We are looking to create a large swathe of the inner city population that has the technical and management skills required to assume ownership. We can then create a variety of ownership models that optimize democratic values,” says Dan Swinney. “Start-ups are great but they have an 80 percent failure rate; buying out existing owners is less risky. And while we have a lot of discussion around cooperatives and how they foster



APA students developed a business model to manufacture whistles for the Manufacturing Engineers Education foundation.

democracy, it is also true that in small, privately held firms you can sometimes have more democracy than in some coops. The opportunity to do something socially significant within the corporate structure is what we should be looking to achieve, whatever that structure may be.”



GALLERY 6 EMPOWERING GIRLS AT AUSTIN POLYTECHNIC ACADEMY

As part of its goal to attract more young people, the manufacturing sector is making concerted efforts to encourage more young women to join its workforce. The girls of Austin Polytech are accepting that invitation.



AUSTIN POLYTECH'S SUSTAINABILITY LEADERSHIP CLUB

Austin Polytech has succeeded in graduating two senior classes and is now taking on another ambitious project. Led by Erica Swinney, a former environmental activist and the school's director of careers and community programs, the school is taking the first steps to embed sustainability education into all aspects of the academic curriculum. Austin Polytech began last year by inviting the International Society for Sustainability Professionals to facilitate the creation of the Austin Sustainability Leadership club. Twice a week, Dr. James Miles, Director of Sustainability Services and Research at Perform Sustain, Dr. Richard Carlson, founder of Carlson Environmental, and Stephen Lane of Capri Capital Partners meet with students for a brown bag lunch to discuss how resource constraints and the plight of the planet must be factored into their personal and working lives.

At a recent club meeting, students were introduced to the concept of the Ecological Footprint and were asked to think about the global implications of how they consume resources. "Our ecological footprint could theoretically extend to Indonesia," one student responded. "If we purchase something made there, we have used their resources and we have put our foot in their county." Later during the class discussion, Carlson informed the students that "there are currently almost 7 billion people on the earth." He followed up with the challenge: "Do you believe that the planet has the capability to support your lifestyle for everyone of those people?" However, proscriptives are avoided at all costs in club discussions. "It is better for students to understand that choices have impacts rather than having a set of values forced upon them," says Miles.

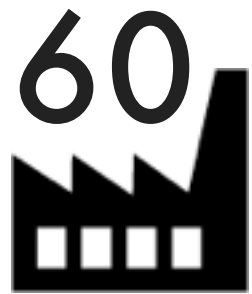
*Miles, Carlson, and Lane are now working with the school's environmental sciences and engineering departments to brainstorm ways to weave the principles of sustainability into daily lesson plans. They draw heavily on the work of the **Waters Foundation**, an organization dedicated to advancing systems thinking in the classroom. Students of the Sustainability Leadership*

Club are now familiar with the concept of closed loop systems and how they minimize material inputs and maximum recycling and reuse. "We would love to see these students become sustainability experts," says Miles, "but it will also be a mark of success to see them employing sustainability systems thinking in whatever they are doing."



AUSTIN POLYTECHNICAL ACADEMY FAST FACTS

INCUBATING A RESPONSE TO A **SYSTEMIC BREAKDOWN**



Chicago area manufacturing companies, partners in the **CHICAGO MANUFACTURING RENAISSANCE COUNCIL**, are providing inner city students with work-based learning experiences, as well as college and career path mentoring.

Since 2007, **75 students** have completed

109 paid internships

or summer jobs at

Austin Polytech's

partner companies.



68 students have participated in

87 job shadowing experiences, learning first-hand about a range of careers, including skilled production, engineering, management, and ownership.



117 students have earned

173 industry-recognized machining

credentials from the National Institute for

Metalworking Skills (NIMS) demonstrating their qualifications to potential employers.

Nearly **90%** of the 2012 graduating class earned at least one NIMS credential.



In 2007, **young workers** between 18 and 24 years old with at least one

NIMS credential  **earned \$28,800** on average, compared to

\$11,439 for those with only a **Chicago Public Schools**  **diploma.** (Source: CLCR)

THE EDGE EFFECT AND THE MANUFACTURING RENAISSANCE MODEL



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*The “edge effect” is what happens at the boundaries between contrasting habitats.
Photo credit: [George Thomas](#) via [photopin](#)*

THE EDGE EFFECT AND THE MANUFACTURING RENAISSANCE MODEL

“The edge effect” is a commonly used ecological term for the phenomenon of creative destruction, rich biodiversity, and ecosystem rebalancing that occurs inside “ecotones,” the boundaries between contrasting natural habitats—a forest and a pasture, or a wetlands and an ocean, for example.

“Edges are also about more than simply re-balancing,” explains Bill Reed, one of the founders of the regenerative design movement. “They are about increased potential of relationship and exchange. The possibility of life happens at edges; they are the bridge and arbiter of relationships—the more edges we have, the richer the potential to improve the resilience of life.”

As the tactical expression of CLCR’s high-level, holistic vision, the Manufacturing Renaissance Campaign faces formidable challenges as the arbiter of relationships along the border between the old industrial paradigm and an emerging one where roles and relationships are as yet undefined. Carving out a collaborative space narrow enough to achieve buy-in from all its stakeholders but broad enough to be game

changing has been a delicate balancing act for its leadership. While the MRC’s mission statement was designed to be in alignment with a broader vision of manufacturing as a democratizing and regenerating agent, it was intentionally framed in far less ambitious terms. “We have struggled for years at CLCR to find a way to achieve sufficient unity in a coalition to drive home a real agenda without requiring unanimity,” says Mike Locker a long-time member and former president of the CLCR board. As Locker notes, “you can’t achieve social justice or economic objectives unless you can put together a coalition that is powerful enough to speak to those objectives in a united way.”

Encounters at “the edges” of the MRC “ecotone” are often rich with possibility but hardly tension-free. For example, while some of the Chicago MRC’s private sector partners are unionized, many are deeply anti-union. Jorge Ramirez, President of the Chicago Federation of Labor and MRC’s co-chair, is acutely aware of this antipathy and tends to tread lightly. He believes, however, that given time and exposure, he



MOVIE 6 *Jorge Ramirez talks about the partnership role labor must play with the private sector in the new industrial era.*

will demonstrate that labor is seeking a new role as a strategic partner with the private sector rather than its adversary.

“Right now you see a lot of companies under attack from outside forces,” says Ramirez. “We want them to see that

there is a collective way out of this, that labor has ideas about how to help maintain jobs and help preserve their industry. We want these advanced manufacturers to see us as someone whose opinions are worth listening to. It is our hope down the line that if their workers then express themselves as wanting to join a union that these companies then see us as someone who is respected at the table with them and someone who has helped preserve their industry. It is our opportunity to work toward a common goal and at the same time say we may have differences of opinion but we can respect each other in our process. I think that is one of the best things to come out of the Chicago MRC—folks focusing on what they have in common rather than their differences.”

Ramirez played a leading role on the Steering Committee for the new Plan for Economic Growth and Jobs developed by World Business Chicago, the city’s economic development arm. As a result of his leadership, the top strategy identified in the plan is for Chicago to become a leading hub of advanced manufacturing. Chicago MRC, Austin Polytech, and the proposed Austin Innovation Park (see page 41) were highlighted in the plan as examples of existing initiatives consistent with this strategy. “This is a big deal because it

represents organized labor’s strategic involvement in shaping economic development policy and contributing to the private sector’s global competitiveness,” notes Swinney. Ramirez recently joined the leadership team of the National MRC, which also includes representatives from the Manufacturing Institute, National Urban League, National Institute for Metalworking Skills, and the Society of Manufacturing Engineers.

Bill Vogel notes that it has also been a challenge to break down “the virtual wall of unfriendliness and mistrust” between the manufacturing and education communities. “The manufacturing community complains that the educational system hasn’t given students the skills they need to participate in the manufacturing workforce,” he report, “and educators have felt that manufacturers have built their companies on the back of cheap labor.”

“We talk a lot at CLCR about how far we can go in building these tactical relationships,” says Edward Hamburg, an operating partner at Morgan Stanley Expansion Capital Partners and a CLCR Director. “At some point do they butt up against, if not go in direct contradiction to, the principles of

CLCR? That has not happened yet and it may not happen for a while, and there is good work to be done before we reach that point. But there is an inherent tension between tactics and strategy.”

Jim Wall, Executive Director of the National Institute for Metalworking Skills, shares that view. “I think the most powerful thing about the Chicago MRC is the cast of unlikely characters that they have put together to focus on the sole issue of improving the manufacturing climate in the Chicago area,” he says. “This is something you rarely see where you have labor, educators, government and business at the table all asking for the same things. There are a lot of areas where they are adversaries, but they all agree that education and training is something they can focus on. To my mind that is the best aspect of this model that we can replicate in other parts of the country— getting that consortium of diverse stakeholders to focus on the importance of manufacturing to the local economy.”

Robert Rosenberg, an adjunct professor of entrepreneurship at the University of Chicago and CLCR board member is also confident that the force and clarity of CLCR’s overarching

nonpartisan vision will enable these unlikely collaborators to transcend their differences. “CLCR’s vision is that the wars need to be over and there are bigger issues to be taken on in transforming American industry,” he reports. “That work is before us.”

THE NATIONAL MRC MISSION STATEMENT

Despite their diverse and at times divergent individual interests, National MRC partners are united in their commitment to four guiding principles:

- 1. The United States must be the global leader in advanced manufacturing.**
- 2. The National MRC’s competitive advantage is a strategic partnership of business, labor, government, education, and community.**
- 3. A world-class educational system is a fundamental requirement for a strong advanced manufacturing sector.**
- 4. A strong advanced manufacturing sector builds communities and a broad middle class, and can drastically reduce poverty.**

PLANNING AN INDUSTRIAL INNOVATION PARK

Austin Polytech does not represent the Chicago MRC's only effort to build the workforce pipeline for advanced manufacturing in Chicago. It has also engaged in outreach to encourage city colleges to introduce a broader range of NIMS programs into their curriculum. The organization is also launching a feasibility study for the Austin Manufacturing Innovation Technology Park, a proposed research and development center at the site of the abandoned Brach Candy factory. The goal will be to create an incubator for commercial innovations and applications as well as to provide enhanced learning opportunities for Austin Polytech and local community college students.

In response to past criticisms that the local community had not been sufficiently engaged in the early planning stages for Austin Polytech, a core team has been assembled to brainstorm the Austin Innovation Park that includes not only local businesses, city leaders, the University of Illinois, and commercial lenders like JP Morgan Chase, but grassroots organizations like Austin Coming Together. ACT is a

collaborative network of not for profits, religious organizations, and individuals working to improve the quality of life in the Austin neighborhood. "We want to talk about the value this can bring to the entire West Side of Chicago," says CLCR's former policy director Amara Enyia. "We don't want this to be a project where the only people who benefit are those who drive in in the morning and go somewhere else after work. Our focus is on workforce development and job opportunities in the Austin neighborhood."

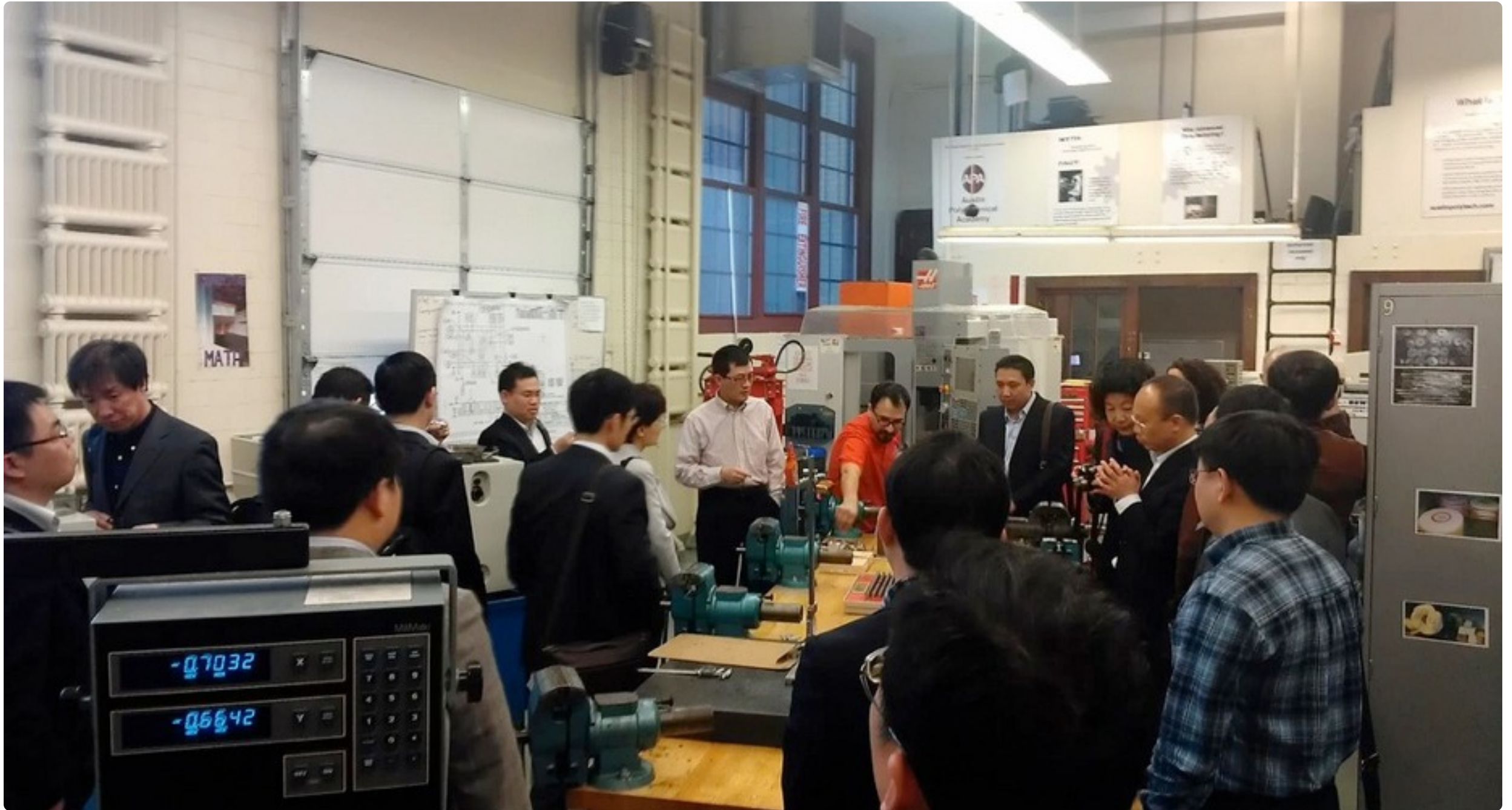
REPLICATING THE MANUFACTURING RENAISSANCE MODEL BEYOND CHICAGO

CLCR has now established the National Manufacturing Renaissance Campaign, an umbrella organization that will oversee nationwide replications of the MRC model. The model's first replication, the Bay Area MRC established in 2011, is already up and running. In addition to launching post-secondary education and credentialing programs, the Bay Area MRC is considering a Polytech Career Program at McClymonds High School in West Oakland. New York, Detroit, and Newark are also in talks with CLCR to explore how they might replicate some variation of the MRC model. "The polytech model looks like it will be a fit in Oakland but in other cities it might not," says National Institute of Metalworking Skills Executive Director Jim Wall. "The key will be to get that consortium of government, education, and labor together at the table. That could mean building on programs that already exist in the community colleges or high schools, or creating new ones. The important thing is to get the focus on creating the pipeline of skilled workers in urban areas."

The New York City public school system, for example, is already advantaged in having a number of strong secondary schools that offer STEM instruction. Mike Locker notes that a New York City working group is currently exploring how it might adapt the MRC multi-stakeholder partnership model in support of a broad swathe of industrial activities in the city.

Interest in the MRC model is building not only in the United States but globally. In the past year, APA students have grown accustomed to official international delegations as diverse as the British Consulate, the China Ministry of Industry and Information Technology, and Australia's Indigenous Stock Exchange trooping through the school's corridors and classrooms. "We have people coming from all over the world to see what makes this program so successful," says Norwin Merens, a former industry coordinator at Austin Polytech. "I have never seen anything like it in my professional career."

A HIGH ROAD FUND ON THE DRAWING BOARDS



GALLERY 7

Austin Polytech has attracted interest globally from groups seeking to replicate its Polytechnic Career Program model.



A HIGH ROAD FUND ON THE DRAWING BOARDS

We live in an era of financial capitalism in which capital flows are increasingly decoupled from the real economy and in which the notion that investment should serve a purpose beyond short-term wealth creation has been all but forgotten. Exemplary projects like MRC that attempt to reverse that trend face significant hurdles. They require innovative “hybrid” funding mechanisms to scale them up. These often involve a combination of “patient” and commercial capital leveraged with grants, and some form of government subsidy, coming together at the frontiers of holistic finance.

Although its initial plans were derailed by the 2008 recession CLCR is now gearing up once again to create a national fund dedicated to sustaining and nurturing small American manufacturers, like those who have partnered with Austin Polytech in Chicago. Possible funders would include impact investors and foundations active in mission-related investing who would contribute capital with a requirement of bond-like returns. The fund would hopefully be leveraged by government funding earmarked for polytechnical education,

job training, and other policy supports for the advanced manufacturing sector. “Right now we are dealing with companies that are already advanced manufacturers,” reports Edward Hamburg, a CLCR director. “You walk into their factories and they are doing cool stuff in cool ways but they can’t get the labor to stay in business. These are high-road businesses operating responsibly in their communities doing things in an environmentally appropriate and sustainable way. If they can do that better we will encourage them and show them how. It will involve maintaining these companies in communities in the way high-road principals would dictate. Our goal is to keep them in business and help them to grow.”

The fund might also facilitate buyouts of small companies facing succession issues. CLCR has had considerable experience in this realm having operated a for-profit arm, Chicago Focus, for a number of years beginning in the late 1980s, to increase the possibility of employee and minority acquisitions of local manufacturing companies. The new fund would be structured to help small manufacturers avoid the

same grim alternatives their counterparts have encountered over the course of the last 30 or so years. “Now when a typical owner retires at 70 his kids want to be doctors or lawyers. They don’t want to run a manufacturing company,” says Hamburg. “These owners are faced with either selling out to a

low-road venture capital group or a global company. Either way the company gets raped and pillaged.” The fund would offer a far better alternative to these companies—helping to facilitate management buyouts by counterparties, in many cases workers, committed to high-road principles.



GALLERY 8

In the Fall of 2011 an Australian delegation representing the Yalanjiwarra Jalunji Marrjanga Aboriginal Corporation, the Indigenous Stock Exchange, the Rumbalara Football/Netball Club (which provides wrap-around services for Aboriginal communities), the Northern Land Council, and the Australian Education Union visited Austin Polytech.

CHAMPIONING THE MANUFACTURING RENAISSANCE AT A BIPARTISAN POLICYMAKING LEVEL



GALLERY 9 CHAMPIONS

Representative Jan Schakowsky of the 9th Congressional District of Illinois is a strong advocate of polytechnic education and of federal policy supports for advanced manufacturing.

CHAMPIONING THE MANUFACTURING RENAISSANCE AT A BIPARTISAN POLICYMAKING LEVEL

CLCR has deployed a very deliberate strategy over the years to put advanced manufacturing on the radar screens of policymakers and legislators at all levels of government and across political parties. In Chicago, City Hall has been responsive to the message.

In the spring of 2012, the Chicago MRC's long-time local campaign in support of advanced manufacturing paid off when Mayor Rahm Emanuel's administration made the sector priority one among its ten strategies for economic revitalization. The study announcing the agenda singled out the Chicago MRC, Austin Polytech, and the Austin Innovation Park as existing initiatives consistent with the city's strategy to make Chicago a leading hub of advanced manufacturing. CLCR now also hopes to tap into Chicago's new infrastructure bank to fund the creation of the Innovation Park in Austin.

"There is a movement in this country back to people making things," says Rita Athas, who heads up World Business Chicago, the city's economic development arm. "Young people

have come to Chicago for the urban environment and the high-end professional services jobs but you can't sustain a whole city with just those job or the lower-pay-scale hospitality jobs that have also been a growth area. What are the types of jobs that pay good salaries and require good skills and are there for the long term? That is where we see manufacturing coming on strong." Athas now serves as a Chicago MRC co-chair along with Chicago Federation of Labor president Jorge Ramirez.

Chicago's municipal commitment to its beleaguered manufacturing sector stretches back to the days of the last Daley administration. Twenty years ago, when Chicago was looking to spur growth in the financial and service sectors after having lost half of its manufacturing jobs, a debate emerged as to whether manufacturing had any role of significance to play in the city's future. "Fortunately, Mayor Daley weighed in that manufacturing mattered," says Dennis Vicchiarelli, World Business Chicago's director of research. "He saw that we needed to do special things to keep it from

disappearing, especially as it was being encroached upon by residential development from wealth in the financial sector and the real estate boom.” The Daley administration resisted considerable pressure from developers to rezone industrial land for residential use, says Vicchiarelli, in many cases preserving this land for small manufacturers who shored up the city’s employment base. Chicago has also been an innovative user of Tax Increment Financing to fund infrastructure improvements in designated manufacturing districts. Local manufacturers are also able to access TIF funds for private projects that ultimately contribute to the city’s tax base.

CLCR has looked beyond Chicago’s local government for support for advanced manufacturing. Swinney recently spoke before the White House forum on manufacturing and met with White House staff. CLCR has also convened a number of other policy briefings at the national level. Leonard McKinnis, CLCR’s national policy director, reports that at a congressional policy briefing hosted by the House Manufacturing Caucus members were encouraged to reallocate federal dollars to support education initiatives based on the Polytech model. “The idea is to creatively

reallocate existing education funds to Polytech initiatives by directing them away from ineffective initiatives and by cutting down on waste,” says Swinney.

The Department of Education offers grants for high-performing schools that provide pathways to college but there is no equivalent grant program in labor or education that links secondary education to manufacturing career jobs. Reports McKinnis: “We want Congress and the White House to broaden their perspective of what is required to support manufacturing at the educational level.” McKinnis maintains that President Obama’s recently announced Skills for the Future initiative, the goal of which is to provide 500,000 community college students with industry-recognized credentials, is unlikely to succeed. “If students are not aware of manufacturing career opportunities by the time they enter post-secondary programs, they are unlikely to pursue training in the industry,” he says. “We make the argument that for the pipeline for students to gain interest in manufacturing to be effective, it must start much earlier.”

CLCR’s efforts to influence policymakers is often an uphill battle requiring patience, hard work, and frequent setbacks.



Dan Swinney presented at the White House Forum on Manufacturing in August 2012 as part of an ongoing effort to put advanced manufacturing on the radar screens of policymakers.

“It is easy to quit but we don’t quit, says Swinney. “The Manufacturing Renaissance Council model is the key and we need infrastructure that demonstrates the power of that model. We need to create a shift from a society that has been dominated by speculative forces to one that is characterized by innovation and real productiveness. We have only so much time, maybe ten more years, to make the transition.”

Swinney envisions the National MRC shaping the discussion around manufacturing in thought leadership and policymaking circles in the years to come. “We now have 60 small companies at the height of the recession that have invested \$250,000 in public education on the West Side of Chicago,” he says. “We have set a high standard for results and these companies are investing in it. We see this can be possible throughout the country.”

FRAMING A NEW NARRATIVE FOR MANUFACTURING'S ROLE IN A REGENERATIVE ECONOMY



MOVIE 7

Erica Swinney advocates for a development approach to solving our environmental challenges—using the tools of manufacturing.

FRAMING A NEW NARRATIVE FOR MANUFACTURING'S ROLE IN A REGENERATIVE ECONOMY

The American public has only a marginal awareness of the contribution that manufacturing is making in the application of renewable energy technologies. It is even less aware of the critical role manufacturing will play in a global economy experiencing relentless population growth at the same time that it is bumping up against planetary resource and waste sink limits. It is a story of manufacturing that needs wider circulation. Advanced manufacturers' business models are grounded in investment in precision technologies that drive continuous reductions in material throughput and energy

expended in the production lifecycle. Utilizing computer numerical control (CNC) processes, manufacturers of the new industrial age are able to produce the most complex parts in sometimes one-off runs, with virtually no excess inventory sitting on warehouse shelves destined for the scrapheap. "Advanced manufacturing is about making it right the first time," says Jim Wall of the National Institute of Metalworking Skills. "It is all about computer engineering and designing, so waste is virtually eliminated."



"There is no easy solution to solving the problems of the environment. It is not as simple as a protest or a picket sign in front of XYZ corporation. What we need is a developmental approach. How can we use the tools of industry, not for the short-term profit of whatever business owner, but to solve the most important technical problems of our time?"

*— Erica Swinney,
former environmental activist and current Director of Career & Community
Programs at The Center for Labor and Community Research*

THE PRAGMATIST'S DILEMMA



Not every one of the Chicago MRC's manufacturing partners is at the farthest reaches of the material throughput and energy efficiency curve. Robert Rosenberg, an adjunct professor of entrepreneurship

at the University of Chicago and CLCR board member, explains why they are nonetheless welcomed as collaborators.

“We are trying to transfer this country from a blue-collar economy to a knowledge one and in a way that is disruptive and creates equity. Educating students in inner cities is a priority in that process. Although we wouldn't presume to prioritize those goals against reducing our carbon footprint we are forced into a bit of a dilemma. We

are surrounded here with neighborhoods that are devastated, that are brown fields, and need massive reinvestment and good schools. And if the employer nearby wants to participate and is not quite the greenest asset, can we afford to make a value judgment against them? Our baseline right now is to ask, is this business sustainable in terms of its margins and the contributions it can make to the viability of the community? Attracting companies that provide the anchor for local wage earners, and that contribute to good schools and neighborhoods is the most pressing problem for us and many other cities in this country.”

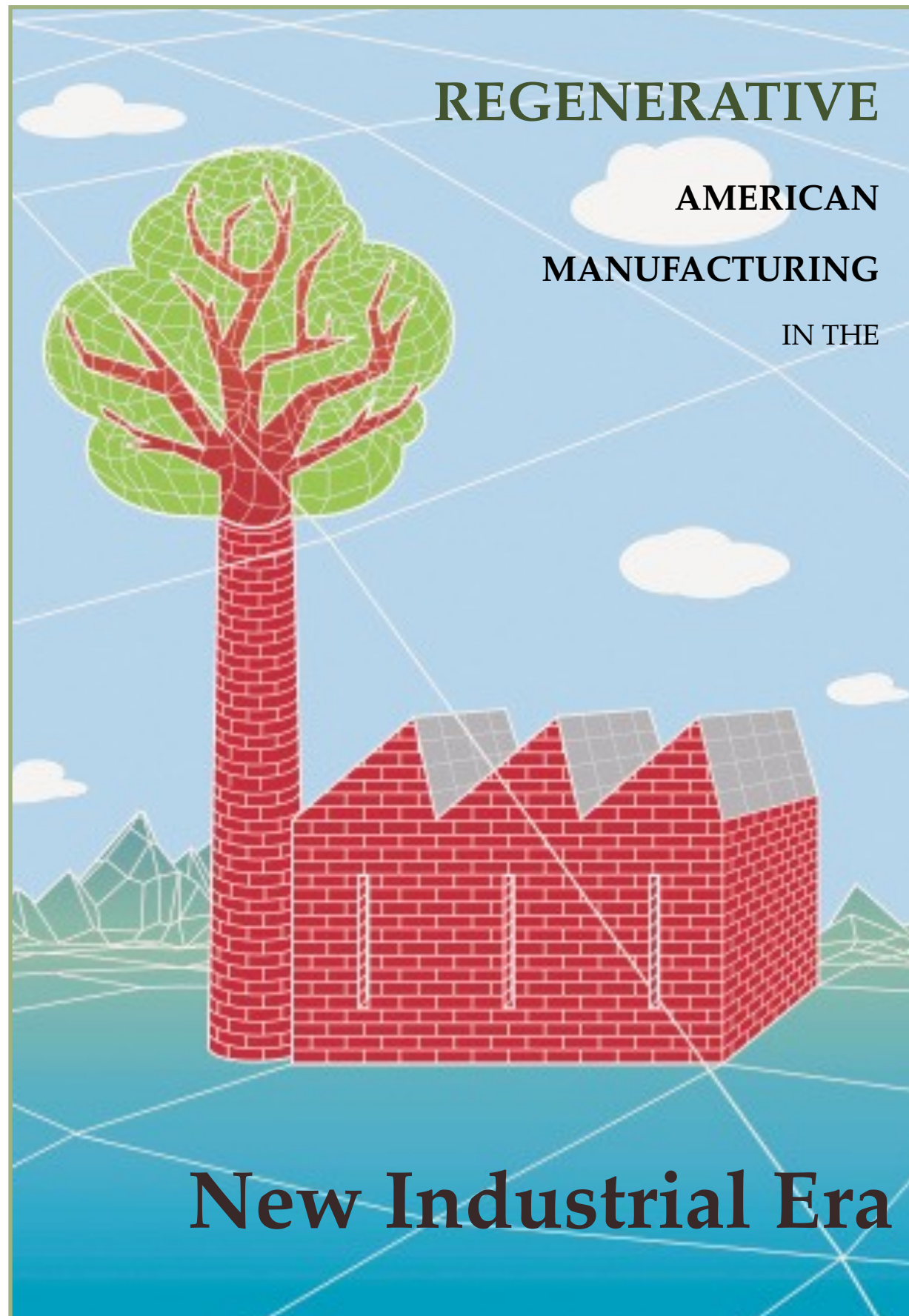
NURTURING A RESILIENT ECONOMY

Nisha Mistry, co-author of the Brookings Institution report, “[The Federal Role in Supporting Urban Manufacturing](#)” and a manufacturing adviser to the City of Newark, has made a close study of the role of small American manufacturers and the largely unrecognized contribution they make to America’s manufacturing supply chain. She reports, for example, that the vast majority of manufacturing firms in Newark are small-to-medium sized, privately held, multi-generational businesses that have been in the city for over 25 years. “These small shops that supply to a larger manufacturing base are key to America’s competitiveness and can’t thrive without access to a diverse workforce,” says Mistry. “They increasingly rely on workers with mid-skilled talent. These men and women are sometimes called ‘half-engineers.’ They possess specialized technical skills but are not in ‘hard science’ professions.”

Nurturing this workforce should be a public policy priority, says Mistry, not only because of the demands of the current advanced manufacturing sector, but because the nature of the skills they have acquired are critical to the longer-term resilience of the American economy. Just as important, says Mistry, these skills are the key to the living wages that are the best shot many inner city youth will have at the middle class.

[click here to return to CLRC RESEARCH](#)

“When you help students gain production skills, you are creating a workforce that will be adaptable to whatever the next wave of technology turns out to be,” says Mistry. “They will be able to think and problem solve on their feet.” Jobs such as CNC machining and welding, Mistry points out, don’t require a four-year college degree (and all the debt associated with it) and they pay higher wages than many service industry jobs.



The real value of industrial output per unit of energy consumed **INCREASED BY 43%** between 1987 and 2007 (Manufacturing Institute)

Even as U.S. industrial production has risen, the amount of CO₂ emissions generated by U.S. factories **DECLINED BY 6%** since 1990.

CO₂ emissions from the transportation, residential, and commercial sectors have all increased since 1990 collectively by 27 percent through 2008. (Manufacturing Institute)

A PARADIGM SHIFT

American Manufacturing has shifted from the old paradigm of "end-of-pipe" treatment of waste and pollution to source reduction of waste, drastically reducing the energy and materials throughput in the manufacturing process.

Nanotechnology innovation, in particular, is accelerating this trend.

ARTISTS OF THE FIELD GUIDE

Robert R. Gigliotti is a photographer based in Chicago. The photographs he shot in this gallery tell the story of the devastating collateral damage caused by the deindustrialization of America's heartland.

Below Gigliotti describes his experience photographing the now vacant Brach's Candy factory in Chicago and other abandoned factories around the country. The Chicago Manufacturing Renaissance Council has proposed that the Brach Candy factory be repurposed to house the Austin Manufacturing Innovation Technology Park.

My father was a chemical engineer and when I was a boy our family moved around the Midwest as his career required of us. Every few years my two older sisters, my mother, my father, and I would be given tours of vast and extremely noisy food production plants. I remember being amazed by the array of complex machines moving canned products in the air and along conveyer belts to other rooms nearby. We would nod our heads to signal we understood

our tour guide's explanations although our earplugs and the intense noise made it almost impossible. The best I could do was follow hand motions to proceed to the next room, hoping it would be quieter there.

In 1984 American Home Products closed their foods division in LaPorte, Indiana, where my father was the plant manager. Nineteen years later, after changing ownership several times, they closed the Brach's Candy factory in Chicago where my father remembers once taking a tour. He still recalls the smell of peppermint burning his eyes when they added the flavoring to the candy. Later at the end of the production line he sampled the finished product to his delight, "the best I've ever tasted." This was just a normal day for my father, visiting a large and loud complex factory. To me, it was bigger than big, full of workers, machines, movement, and the smell of something delicious.

When I entered the vacant Brach's factory on the West Side of Chicago to take these photographs, the stench of decay and mold hit me the moment I climbed in. Open spaces and mazes of hallways seemed to go on endlessly, floor by floor. I heard hardly a stir in a building that once employed as many as 3,500 people. Creaking bits of pipe dangling from the ceiling and the sound of metal rusting were around every corner. I visited Brach's four times over the course of five years. I never once encountered a single other person. As I walked though, time after time, all I saw was human waste, spent spray paint cans, trash, dirty clothes, and, adorning Brach's concrete walls, literally hundreds if not thousands of some of the most amazing graffiti art I've seen.

It's stunning to think it cost \$5 million dollars to build Brach's in 1923. (That would be nearly \$68 million today.) The added cost of machines and the expense to ship them all to Mexico to produce candy was something that I couldn't get out of my mind as I explored the space. It was hard to believe the candy I once paid a nickel for as a boy from the "pick-a-mix" kiosk at the local grocery store could ever have been produced in this nonliving hellhole. After 76 years in

operation, Brach closed its doors in 2003, moving production to Mexico where labor and sugar were less costly. By the time I photographed Brach's, only six years later, the extent of the decay was devastating and shocking. Today it's only a shell of what it once was—a thriving American manufacturing company.

GALLERY 10



Brach's boiler room and demon graffiti, artist unknown.

• • • • •

[Click here to return to the main article.](#)

THE HIGH-ROAD MANUFACTURING PARTNERS OF AUSTIN POLYTECHNIC ACADEMY



Michael Bentley guiding APA students

JOHNSON CONTROLS

Through their mentoring experiences with Michael Bentley and other members of Johnson Controls' African American network, Austin Polytech students get close contact with a manufacturing company whose core model is grounded in enabling its customers to operate with a lighter ecological footprint. Warren Johnson, credited with inventing the electric thermostat, founded the company in Milwaukee in 1885 with a small group of investors. Today, the company operates in 150 countries employing 162,000 people. Johnson Controls specializes in the creation of products and services to optimize the energy and operational efficiencies of buildings. It is also a leading producer of both lead-acid batteries and advanced batteries for hybrid and electric cars. An entire division of Johnson Controls is dedicated to reducing client usage of energy, water and lighting. At the same time, Johnson Controls continually looks for ways to reduce its own material and energy throughput.

As the vice president of Johnson Controls' Field African American Affinity network, Michael Bentley, general manager of the company's compressors operation in Wheeling, Illinois, felt a natural affinity with the Austin Polytech Career program. "Bill Vogel came out to my office and asked for support," Bentley recalls. "I personally committed to the program after my first visit to the school. I saw that students were interested in my career path and I had a lot I could share with them. There was a secondary benefit because this is a program that is training a group of students to be the workforce of the future in manufacturing. We have plants globally that could utilize the skill sets the students are developing."

During their first visit to APA, about 35 Johnson Controls professionals met with a group of 90 students to talk about preparing for college and about the tools they would need to succeed in sustainable technology careers. This led to a variety of more intimate encounters with smaller groups of 15 or 20 students. Now two or three representatives from the company mentor students

throughout the year, providing support and guidance, and information about sustainable technologies and education. Bentley emphasizes the importance of introducing students to industry leaders who represent their demographic.

At a recent visit to the Wheeling operation Bentley showed students an example of how the company has embedded sustainable practices in its own operations by reutilizing compressor housings that it would have discarded in the past. "A typical compressor housing is made from cast iron," Bentley explains. "Some housing needs to be forged in a foundry, transported for machining and then sent on to our operations in Wheeling. By utilizing reworked housing and other components we avoid the forging process and the transporting for machining. We save materials and energy and the associated costs and can pass a substantial cost savings along to our customers. So there is value for the customer and benefit for the environment, and competitive advantage for us."

HUDSON PRECISION PRODUCTS

Joan Wrenn, the straight-talking CEO of family-owned Hudson Precision Products, maintains that companies like hers that are partnering with the Chicago MRC share a “can-do” spirit and are in it for the long haul. “If we were here just for today we would not put energy into Austin,” she maintains. “We would be saying, ‘if we don’t find the people to fill the jobs, well then we are through. It is a struggle and it is huge. But as my sons say, ‘we will disappoint a lot of people in heaven if we let this company fail.’”

In a precision machine products sector where 400 companies have shuttered their doors over the last five years, Hudson Precision Products has emerged as a survivor. Founded in 1906, the company currently employs 72 people in Broadview, Illinois, and has been in Joan’s family since 1933. Although it has struggled through the current recession, Hudson is committed to



Joan Wrenn, CEO of Hudson Precision Products
Photo credit: [Peter Le Grand](#)

the revitalization of the urban manufacturing sector and to investing in the next generation manufacturing workforce.

Hudson has experienced first-hand the fallout from the disconnect between the American system of public education and the requirements of the manufacturing labor force. Like other advanced manufacturers, Hudson has been able to maintain a given level of output with increasingly fewer workers over the years, but at the same time the skill sets required of those workers have become increasingly sophisticated. “We had a group of 42 entry-level positions up to seven or eight years ago,” she notes. “Today we have eight people because the technology has replaced the others.” Meanwhile, Hudson has had to import personnel from Europe on work permits because they could not find domestic workers with the requisite skills.

These labor mismatches were a strong motivating factor in Hudson’s decision to partner with Chicago MRC and Austin

Polytechnical Academy. Wrenn has been deeply involved in curriculum development for Austin’s Career program, in offering students’ direct exposure to Hudson operations, and in mentoring students. She maintains that students will benefit hugely from their relationships with partner companies who are committed to MRC’s “high road” principles. “Not every high school graduate can or should go to college,” she says. “But even students that should need to get money to go to school or affiliate with a company like ours that will help pay tuition.”

Hudson offers numerous opportunities for APA students, including tours, job shadowing, and internships. Through these interactions students are gaining a new perspective on the realities of 21st century American manufacturing, and what it means to be part of what Wrenn calls Hudson’s “worker-family.” Of Hudson’s 72 employees, 23 have been with the company for over 25 years and 6 retirees had been employed for over 50 years.

This past summer, two APA students joined Hudson after graduation. Wrenn notes that one came to her a month later and said, “I hope you are not disappointed, but I am going to college.” He had secured the financial wherewithal to enroll in an engineering program at a four-year college, and Wrenn is happily cheering him on. The second APA graduate is assuming an apprenticeship position with Hudson and will be studying machining at a junior college this fall. Hudson is footing his tuition bill.

Wrenn believes local manufacturers who take part in educational partnerships like APA will be able to source the next generation of skilled workers from current students as well as from the ranks of the urban un- and underemployed. She is now an enthusiastic booster for the Austin Polytech Career program in the local manufacturing community. “We say, yes, you have to take a leap of faith with Austin graduates,” she says. “But they have strong basic skills. You hire an entry-level person from Austin and they have that background. So we tell a manufacturer, you can get CNC operators or someone

interested in advancing their education out of this program and it is much better than hiring someone off the street.”

WATERSAVER FAUCET COMPANY

Steven Kersten, president of WaterSaver Faucet Company, says, only halfjokingly, that his company gave seed money to APA to develop its manufacturing technology center under two conditions: “One was they had to have a big sign that said this was the WaterSaver Faucet Company machine shop, and two, I have to be able to get their best graduates.”

Samuel Kersten Sr. and his son founded WaterSaver Faucet Company in the late 1940’s in Chicago, Illinois. WaterSaver has grown to be one of the largest manufacturers of faucets and valves for laboratory and industrial applications in the world. The company has maintained its original roots in the city of Chicago. Steven

Kersten, WaterSaver's current president, represents the third generation of family ownership. Kersten is an enthusiastic Chicago MRC partner. He has attended Congressional Briefings in Washington in support of MRC initiatives, and WaterSaver was also the major funder of Austin Polytech's state-of-the-art Manufacturing Technology Center. Kersten is confident that WaterSaver will get a good return on its investment in APA, and not just in the monetary sense. "I'm very interested in the mission of the school and the fact that you're trying to take kids from very impoverished backgrounds and give them a skill set that can translate into success in today's economy," he reports. "But there was also a strong element of self interest for us. We made the commitment to stay in the heart of Chicago and in order to make that work we need people to work in our factory. We need people who come in with the work ethic and the skill set and the knowledge base to program a CNC machine, to run an automated powered coating system, and to read work instructions."

In the summer of 2012, WaterSaver hired four APA alumni. One of these individuals had worked at WaterSaver in the summer of 2011 while she attended college. She may transition to part-time work while she continues her studies this fall.

WINZELER GEAR

Winzeler Gear is a case study in how a small manufacturers' engagement with academic partners has not only bolstered its competitive advantages, but has helped to nurture a skilled urban manufacturing class and a more stable inner city community while inspiring creative connections between the arts and manufacturing.

Winzeler Gear, a Chicago-based, family-owned company that manufactures precision gears from cutting edge plastics, traces its origins back to 1908, when John Winzeler founded Winzeler Metal Stamping Company. The company was forced to close during the Great



GALLERY 11

WaterSaver Faucet Company is one of Austin Polytech's closest supporting partners.



Depression, but was revived in 1940 by Winzeler's son Harold. Renamed Winzeler Gear, the company is now headed up by John Winzeler's grandson and namesake.

Like its MRC partner Hudson Precision Gear, Winzeler has maintained its competitive advantage and increased productivity by integrating computer software and next-generation automation equipment into existing operations. Like Hudson, Winzeler now needs fewer employees but with a higher level of skill to maintain operations than it did a decade ago. While ten years ago 50 employees were required to produce 5 million gears a month, today Winzeler can produce 12 million gears with only 35 employees. Meanwhile, John Winzeler, Jr., has found it increasingly difficult to find workers with the requisite qualifications.

"The problem today is my lead workforce, the people who run our day-to-day organization, were a product of schools in the area that still had hands-on learning for the autodidactic student," says Winzeler. "And there were a

lot of them out there. They got hooked on it, they found something they liked, and did it very well. The next generation of those people don't exist because of the philosophy that everyone must go to college and learn out of a textbook. We need an awareness campaign and information needs to get out to society that there are meaningful careers in these fields and they have not been outsourced."

Winzeler Gear is deeply engaged in efforts to help create and educate a new urban manufacturing workforce.

Winzeler is active in [Project Lead the Way](#), an organization that promotes science, technology, engineering, and math (STEM) curriculum. The company offers Project Lead the Way students mentorships and workplace experiences as well as apprenticeship training. "We do this because we come from a family of educators," says Winzeler, "And we realize we don't have the workforce we need today, let alone tomorrow."

The 69-year-old Winzeler, an engineer by training, keeps both sides of his brain in trim as an adviser to both the fashion school and the industrial design school at Chicago's Art Institute. This summer he hosted a design competition for the school's Advanced Headwear Concepts class featuring headwear inspired by the gear. Winzeler awarded \$2000 in scholarships to the top three designers.

Winzeler Gear has also cultivated a mutually beneficial partnership with Bradley University, Winzeler's alma mater. "We use the R&D tax credit to set up research programs with Bradley throughout the year," Winzeler reports. "We have 3 or 4 programs going at any one time. We have a small lab at the university that allows us to educate professors in what we need today and we use their skill sets to help us solve problems, to run friction and durability research."

"I think the model we see emerging," says Winzeler, "is how do you get the right public and private partners to come together to reduce unemployment and better align



Artwork is everywhere on the walls of the Winzeler Gear factory. John Winzeler utilizes art to inspire employees and remind them of the importance of bringing creativity to their every-day problem solving challenges.

people sooner with their career objectives so they can become lifelong learners. When I came out of engineering school in the early '60s I could fake it for five to ten years because technology didn't change that much. Now in six

months time, if you are not continually reading and learning you become obsolete very quickly. We have an

engineer in his mid 80s who just filed two patents. So age has nothing to do with it, it is a state of mind.”



The Winzeler Gear facility in Harwood Heights is the site of Transmission, a permanent installation of eighteen translucent panels created by photographer Erich Schrempp, which are visible from the inside by daylight and from the outside at night. In January of 2010 the piece was installed with new panels printed directly onto Plexiglass.

Photo credit: [Erich Schrempp](#)

THE INTANGIBLE BENEFITS OF AUSTIN POLYTECH'S PARTNERSHIPS



GALLERY 12

Benefits go both ways between Austin Polytech's private sector partners and students.

THE INTANGIBLE BENEFITS OF AUSTIN POLYTECH'S PARTNERSHIPS

For Austin Polytech students, the majority of whom have had no previous exposure to manufacturing, the experiences they gain through the school's private sector partners can be transformative. "When we take on a student we consider ourselves their partner in career development," says Hudson Precision Products CEO Joan Wrenn. "We help structure the student's education and give them a network of support they can depend on. We want them to understand what it is to own a business, not just what their role is in that business."

Manufacturing companies that sign on to partner with Austin Polytech tend to be guided by concerns beyond their bottom lines. But their engagement with a population they may never before have considered potential constituents of their workforce has added a new dimension to their values-driven approach to doing business. "It takes a special individual in our partner companies to understand what is going on here and to make a difference," says Peter Schoedel, the school's former engineering teacher. "They know they are going to be committing themselves to a group of inner city high school

kids from low income families who come to us with, on average, fourth and fifth grade levels of reading and math skills, but they sense there is value here in the making."

"It is in the interest of our economic health and security for manufacturing to rethink what we do in partnership with the educational system," maintains John Winzeler, "If we can help young people or transitioning people find work in manufacturing, that gets us all to a better place in the global competitive landscape. It is a good investment for everyone."

CLOSING THOUGHTS



MOVIE 8 Dan Swinney and John Fullerton discuss manufacturing's role in the next, regenerative industrial age.

A NOTE FROM THE FIELD GUIDE PROJECT DIRECTOR



We all participate in an economy delivering an ever-widening wealth gap and operating outside the earth's biophysical limits. In this context, is achieving sustainability a sufficiently ambitious goal? At Capital Institute we think not. We believe we must instead move quickly beyond mere sustainability to nurture enterprises that are powerfully regenerative of our damaged social and eco-systems. Almost two years ago, Capital Institute embarked on the Field Guide to Investing in a Regenerative Economy project to engage with such real world enterprises. Since then, the common threads running through these disparate initiatives have continued to reveal themselves, providing rich insights into what the tapestry of a regenerative economy—one that heals what in the past it has compromised—might look like.

We have admired the pragmatism and courage of Field Guide project leaders as they promote their expansive visions within real world constraints. How do the managers

of Grasslands LLC, the subject of our first Field Guide study, convince an older generation of South Dakota ranchers and even the U.S. Bureau of Land Management of the virtues of holistic management? How do the leaders of the Manufacturing Renaissance in Chicago explain to inner city parents that careers in manufacturing aren't the dirty and dead-end jobs that left their neighborhood years ago? Through our Field Guide studies we are only just beginning to grasp the wisdom we can extract from examining how these projects sometimes succeed and sometimes fail to win over key constituencies.

Ted Howard, Executive Director of the Democracy Collaborative, tells us that the Evergreen Cooperatives, the subject of our second Field Guide study, are about "unleashing the energy of people to become actors in the history in their own lifetimes." We have in turn been energized by Evergreen worker-owners' enthusiasm as they

see their opinion counting in the work they do every day. It has been exciting to talk to inner city students at the Manufacturing Renaissance's lead initiative, Austin Polytechnical Academy, as they make the connections between what they are learning in calculus class and during lunch club discussions of "systems thinking," and what they observe in job shadowing experiences with Austin's private sector manufacturing partners. We hope our Field Guide studies also communicate some of that optimism, while illuminating the qualities of the regenerative economy we see taking shape.

We also seek to challenge the Field Guide business models as well as celebrate them. In the Field Guide's next phase we will begin to explore how far the regenerative boundaries of these exemplary projects can be pushed. We know, for example, that holistic management can revitalize degraded pastureland, sequestering massive quantities of carbon in the process, but can projects like Grasslands also revitalize compromised rural human communities in meaningful ways? Can the Evergreen Cooperatives make a real dent in the poverty of

Cleveland's University Circle and stay focused on a mission to provide the leanest and greenest business solutions for local anchor institutions? Can the Patient Capital Collaborative, the subject of our third Field Guide study, expand beyond the angel impact investor sector and persuade institutional asset managers to invest for social and environmental outcomes that will add an incalculable value to their clients' portfolios? Can the Manufacturing Renaissance Campaign deliver a ticket to the American middle class as well as a rigorous manufacturing model that recognizes that material throughput must be aligned with ecosystem constraints?

The jury is still out. Both the bar and the stakes are high. The Field Guide will continue to tell the stories of these innovative projects, but it will do more than that. Together with Field Guide project leaders and the Capital Institute's trans-disciplinary community of thought leaders and practitioners, we hope to reveal the emerging ecosystem of the regenerative economy. We invite you to join us.

—Susan Arterian Chang

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Dan Swinney and John Fullerton talk about the LBO Era

[Movie 2](#)

Dan Swinney and Jorge Ramirez define the high road

[Movie 3](#)

Challenges and successes at Austin Polytechnic Academy

[Movie 4](#)

What is a polytechnical education?

[Movie 5](#)

Students and teachers talk about hands-on learning at Austin Polytech

[Movie 6](#)

Jorge Ramirez talks about the possibilities of labor’s new partnership role

[Movie 7](#)

Erica Swinney advocates for using manufacturing as a tool for environmental remediation

[Movie 8](#)

Dan Swinney and John Fullerton discuss manufacturing’s role in the next, regenerative industrial age

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Evergreen Cooperatives Field Guide Study

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Robert R Gigliotti’s photographs of the abandoned Brach Candy factory

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A student takes her NIMS Credentialing Test

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Students and mentors of the Austin Polytechnic Career Program

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Portraits of Pride, Possibility, and Purpose

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Empowering girls at Austin Polytech

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Austin Polytech attracts global interest

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Benefits go both ways at Austin Polytech

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The Rise of Financial Capitalism...The Decline of American Manufacturing

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Austin Polytechnical Academy Fast Facts

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Regenerative American Manufacturing in the New Industrial Era

Capital Institute Field Guide Studies

GRASSLANDS

<http://www.capitalinstitute.org/sites/capitalinstitute.org/files/docs/Grasslands-REGEN%20%282%29.pdf>

EVERGREEN COOPERATIVES

[http://www.capitalinstitute.org/sites/capitalinstitute.org/files/docs/FS2-Evergreenarticle-C%20\(2\).pdf](http://www.capitalinstitute.org/sites/capitalinstitute.org/files/docs/FS2-Evergreenarticle-C%20(2).pdf)

PATIENT CAPITAL COLLABORATIVE

<http://www.capitalinstitute.org/sites/capitalinstitute.org/files/docs/PPCepub%20%282%29.pdf>

White Papers and Research Studies

A PORTFOLIO APPROACH TO IMPACT INVESTMENT

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THE FEDERAL ROLE IN SUPPORTING URBAN MANUFACTURING

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WHY AUSTIN?

[*http://www.capitalinstitute.org/sites/capitalinstitute.org/files/docs/Why%20Austin.pdf*](http://www.capitalinstitute.org/sites/capitalinstitute.org/files/docs/Why%20Austin.pdf)

Websites:

Capital Institute

<http://www.capitalinstitute.org>

Austin Polytechnical Academy

<http://www.austinpolytech.org/>

Center for Labor and Community Research

<http://www.clcr.org/>

Chicago Manufacturing Renaissance Council

<http://www.chicagomanufacturing.org/>

Evergreen Cooperatives

<http://evergreencooperatives.com/>

National Manufacturing Renaissance Campaign

<http://www.nationalmanufacturing.org/>

Patient Capital Collaborative

[http://www.sustainvc.com/
PCC_Mission.html](http://www.sustainvc.com/PCC_Mission.html)

RSF Social Finance

<http://rsfsocialfinance.org/>

Savory Institute

<http://www.savoryinstitute.com/>

November 13, 2012—Chicago’s Mayor Rahm Emanuel announced \$1.25 million in funding for five Austin Polytechnical Academy programs, including funding for the exploratory phase of the Austin Manufacturing Innovation Park, for enhancements to the Austin Polytech Career program, and for a machining training and credentialing program for adults.

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Unless otherwise noted photography is by Austin Polytechnic students and staff.

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