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The IEDC
Economic Development Journal

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Unleashing Fundamental Change

Networking Transformational Thinking and Action Through Economic Development

Clean Energy

An Ultra-Dynamic Game of Chess

Turning Coal into Diamonds

The Ottawa Power Station Redevelopment Project

Building an Entrepreneurial Ecosystem in Northwest Florida

A Multidimensional Strategy for Building an Innovation-based Economy

Sustainable Lisle Business Partnership

Green By Choice

Auto

One of the Most Significant Industries in North America

INTERNATIONAL
ECONOMIC DEVELOPMENT
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The International Economic Development Council (IEDC) is the premier international association dedicated to leadership and excellence in economic development. IEDC can equip you with the tools and resources that are helping to shape economic development throughout the country and around the world. Our services include:

- *ED Now*, a twice-monthly newsletter
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- Improved access to resources and information
- Enhanced educational choices
- Stronger advocacy and access at the federal level
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- Industry-leader publications
- Expanded research and technical assistance
- An international presence

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Chair: Jay C. Moon, CEcD, FM
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Jay C. Moon, CEcD, FM
IEDC Chair

dear colleague

I am honored to become IEDC's newly elected board Chair. Playing a leadership role for the premier economic developer's association will be a challenging and rewarding experience. I am especially enthusiastic about working with IEDC's staff and board members, both of which are comprised of effective and knowledgeable professionals. Together, we make a great team.

Our Governance Committee members will serve as the organization's leadership team for 2012: Paul Krutko, FM (Vice Chair); Dennis G. Coleman, CEcD, FM (Immediate Past Chair); William C. Sproull, FM (Secretary/Treasurer); JoAnn Crary, CEcD (External Member Relations); Lynn Martin Haskin, Ph.D. (Planning and Business Development); and Barry Matherly, CEcD (Performance Oversight and Monitoring). Each of these individuals brings a unique array of strengths to the board and is committed to IEDC's continued success.

I have defined three goals for 2012:

- Create a framework to support the manufacturing sector
- Support and expand our partnerships throughout North America and the globe
- Provide IEDC members with cutting edge economic development strategies and best practices

A recent report from IEDC's Economic Development Research Partners, *"Jobs in the Making: Economic Development Strategies to Grow Manufacturing,"* spurred IEDC's recent web seminar, "Workforce Development Strategies to Spur Manufacturing Growth." It was the first of many upcoming initiatives addressing manufacturing. You can anticipate additional information, supporting manufacturing, during IEDC's 2012 conferences.

Federal Economic Development Forum, *Building Tomorrow's Economic Foundation*, Alexandria, VA, March 18-20

Spring Conference, *Driving Innovation and Prosperity: Transforming Industries and Communities for the Next Economy*, St. Louis, MO, June 10-12

Annual Conference, *Energizing Today to Empower Tomorrow*, Houston, TX, September 30-Oct 3

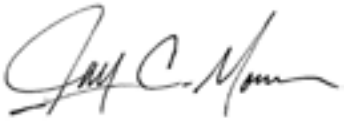
Participation in these conferences will provide economic developers with strategies, tools, and resources to build and maintain a resilient manufacturing economy within their respective communities. I encourage you to make plans to attend.

This past year, IEDC signed memoranda of understanding for collaboration with the economic development organizations of three Canadian provinces: **Economic Development Association of British Columbia, Economic Development Alberta, and the Economic Development Council of Ontario**. I anticipate expanding such partnerships. Our **goals** will be to **share** access to products, services, and professional information; **create** a consistent and unified professional image; **collaborate** to enhance financial stability and growth; and **innovate** within the profession – raising the visibility of model practices. IEDC has also accredited its first economic development organizations in Mexico and Canada. I hope that additional organizations, both in the U.S. and abroad, will engage in partnerships with IEDC or embark on the accreditation process in 2012.

Another critical priority is to bolster IEDC's already impressive reputation. Through its conferences, professional development courses, journal, newsletters, clearinghouse services, and many other offerings, IEDC will continue to be the go-to organization for the tools and knowledge necessary to establish your community as leading competitors in the global economy. Relative to this effort, IEDC has revised all training manuals. The organization is updating the CEcD exam, accordingly, to reflect the content in the manuals and to maintain the certification program as the gold standard for economic development professionals. IEDC also plans to introduce a redesigned website that will raise the organization's profile and make it easier for members and other stakeholders to access the many valuable resources available.

I look forward to further assisting IEDC's mission of providing leadership and excellence in economic development for our communities, members, and partners. We will all be working together to turn today's obstacles into tomorrow's opportunities. I am honored to serve as your 2012 Chair and am committed to continue the exemplary leadership provided by IEDC's esteemed list of volunteers.

Sincerely,



The IEDC
Economic Development Journal

TABLE OF CONTENTS

PAGE 10

PAGE 18

PAGE 35

INTERNATIONAL
ECONOMIC DEVELOPMENT
COUNCIL

unleashing
FUNDAMENTAL CHANGE

By LaDene Bowen, CEcD, FM; Ronnie Bryant, CEcD, FM, HLM; Jim Damicis; Scott Gibbs; Rick Smyre; and Mark Waterhouse, CEcD, FM, HLM

"Problems cannot be solved by the same 'level of thinking' that created them."

– Albert Einstein

"When we are no longer able to change a situation, we are challenged to change ourselves."

– Victor Frankl

OVERVIEW

We've been borrowing from the future, and the debt has fallen due. We have reached or passed the limits of our current economic model of consumer-driven material economic growth. We are heading for a social and economic hurricane that will cause great damage, sweep away much of our current economy and our assumptions about the future, and cause a great crisis that will impact the whole world and to which there will be a dramatic response.

– Paul Gilding
The Great Disruption

The basic premise of this article is that the global economy has changed in fundamental ways, and the current practice of economic development is no longer working and needs to be changed. If you don't agree with that premise, there is no need to read further.

OK – so you are still here. Let's explore that premise more.

In a time of such fundamental change, the very idea of what kind of change is occurring needs to be considered. We are in a transition from an Industrial Society to a new type of society that some have titled an Organic Society, in which fundamental principles of thinking and organization are transforming. Everywhere one looks, whether in education, governance, the military, leadership, or economic development, one sees the term transformation, or its derivatives…both as a noun and adjective.

We live in an age of transformation, not one that is merely in the process of reforming traditional concepts. The more articles about transformation you read, the more it becomes apparent that there is much confusion between "reforming change" and "transformational change". This is not done to be disingenuous or with deception by intent. Rather, we are caught in a time when there is often a misconception of the fundamental ideas of what transformation is and how it can occur….and is already occurring. Reforming change modifies, improves, and makes more efficient and effective ideas and methods that have existed for many years. Transformational change redefines institutional structures and challenges undergirding principles.

It is our belief that we live in an age of such significant change that the very worldview we have used for 200 years is in the process of transforming. Additionally, we believe that this transformation is structurally changing our economy and society and

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NETWORKING TRANSFORMATIONAL THINKING AND ACTION THROUGH ECONOMIC DEVELOPMENT

The global economy has changed in fundamental ways and the current practice of economic development is no longer working and needs to be changed. We live in a time of transformation when there are three different types of economies mixed together for the first time in history – the old industrial, recent knowledge and emerging creative molecular economies. As a result, practitioners of economic development will be required to expand their focus beyond creating jobs primarily through recruitment and retention. Economic developers will need to help build successful communities that can adapt to constant change using the emerging principles and skills of "comprehensive community transformation."

The recent economic recession has raised questions among economists regarding how long this downturn will continue and when will we recover. For economic developers however there is a more fundamental question: "Are we in the process of shifting from an Industrial Economy to a Creative Molecular Economy?"

has profound implications for the practice of economic development.

We are currently in a "weak signal" stage of the next iteration of an economic system. This system demands economic developers who are able to shift their thinking and action back and forth among the current and rapidly changing future needs of business attraction and expansion (declining in importance over time); the development of a workforce capable of moving beyond continuous improvement to continuous innovation; the formation of individual collaborative connections and disconnections; and many other interrelated challenges and opportunities to help new knowledge emerge. It will be the connection of new knowledge to new resources in the creation of transformational projects that will seed what we call a "Creative Molecular Economy," a term that is further explored and defined below.

The recent economic recession has raised questions among economists regarding how long this downturn will continue and when will we recover. For economic developers however there is a more fundamental question: "Are we in the process of shifting from an Industrial Economy to a Creative Molecular Economy?"

Our answer to this question is that we are in the midst of a fundamental systemic change. The idea of developing a new type of economic resiliency in our communities and society is at the core of preparing for a different kind of economy that will need to adapt to constantly changing conditions. Furthermore, this resiliency cannot be achieved through just reforming the current practice of economic development. In other words, we can't just tinker at the margins.

Adding to the complexity over the next 20 years is the fact that there are three different types of economies that are in churn and mixed together for the first time in the history of the world.

1. The first is the very last stages of the old Industrial Age Economy based on hierarchies, economies of scale, mechanization, and predictability.
2. The second is a transitional economic phase called the Knowledge Economy that was recognized a decade or so ago and is based on knowledge creation and diffusion.
3. This transition phase is reaching its maturity and will quickly shift within the next ten-to-fifteen years to an emerging Creative Molecular Economy (CME) in which biological principles will form the framework for how the CME will be organized and operate.

This newly emerging economy will flow with the speed and strength of a surging river, constantly overflowing the banks of traditional economic principles and thinking. A key principle in preparing for success in this new economy will be the need to have leaders in communities who are open to new ideas and begin to understand the challenges they face in transforming their approach to the future systemically – how they connect ideas, people, processes, and methods; how they develop a culture in support of continuous innovation; how they build new capacities for a new type of economic development involving as many citizens as possible with distributive intelligence; how they create an environment for individualized, autonomous education/learning; how they shift paradigms of governance using mobile technologies – and the list goes on and on.

This is no small task for economic developers…it WILL NOT BE EASY. There is no template, model or standard operating procedure to guide the journey. This new economy is in the process of emerging before our eyes. As a result, a unique opportunity is presented for economic developers that is counterintuitive and, at present, largely hidden in the fog of an incomplete and not fully formed future.

Since the profession first developed in the late 19th century, economic developers, for the most part, have been focused on the functions of business and industry attraction and expansion, with a more recent attention to business creation. The Industrial Society brought with it the term "jobs" and, until recently, there was an understanding that a focus of the economic developer was to attract "jobs" into his/her local community, region, state or specific geographic boundary.

The profession rocked along for years until the "weak signals" of change in jobs provided per business relocation began to occur in the 1980's. Over the last 20 years, the number of jobs created per recruited business has declined. Impacting this is the projection by forecasters such as Dr. Marvin Cetron, that by 2015, only 4-8 percent of all the jobs in the U.S. will be in manu-

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What has become obvious is that we are in a time of comprehensive transformation – and only by systemic approaches will we be able to adapt to an increasingly fast-paced, interconnected and complex society and economy. Minor reform of current systems and thinking will not get the job done.

facturing. A recent 2011 Kauffman Foundation study (*Starting Smaller; Staying Smaller: America's Slow Leak in Job Creation*) of business formations over the last 20 years reported a reduction in number of start-ups established per year as well as jobs provided per start-up.

The confluence of these and other trends and weak signals reflects a continuous shift to a more digital, entrepreneurial economy driven by collaborative networks. This Creative Molecular Economy will be defined by the following:

1. New ways to access capital for start-ups;
2. A *Future Forward Workforce* able to adapt to any of the three types of economies;
3. An ability to identify weak signals about what the future holds;
4. A broad-band infrastructure capable of uploading and downloading massive amounts of data and video-streaming;
5. The formation of interlocking networks to build momentum for new ideas, whether economic, educational or governance; and
6. Crowd-sourced innovation.

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A UNIQUE APPROACH

As a result of the transformation of society and the economy, the economic development profession has an opportunity to transform itself to be aligned with the changing requirements brought about by the emergence of a Creative Molecular Economy. The last 30 years in business and industry have focused on lowering costs, increasing productivity of production and service delivery, and increasing demand for consumption. In this environment, the economic developer could focus on competing for business attraction and retention/expansion within specific geographic areas primarily through incentives to lower costs, providing necessary infrastructure, finding access to financing, and expanding worker training.

It was a natural fit for the special expertise needed in an economic system where specialization was the norm.

We are now moving at light speed into an age of dynamic connections and disconnections, where the economic vitality and sustainability of any local area, region or state will be based on how well its leadership, workforce, capital availability, educational system and methods, and governance decision-making processes are able to adapt quickly and effectively. Hierarchies, standardized processes, and predictability will give way to interlocking networks, multiple methods, and finding comfort with ambiguity, uncertainty, and even situations that are more chaotic. Of great importance will be the ability to build parallel processes where different people and organizations work in deep collaboration to help each other succeed – not just in individual communities but across the globe as well. True transformation will not occur unless many projects, programs, processes, and people are involved in a totally new system of dynamic, adaptive planning and execution.

It is this emerging context of a new society and economy that offers – perhaps requires – a unique approach for traditional economic developers who realize *that only a system and processes of community transformation will provide a healthy economy* – and that their local communities, by themselves, may not yet have the types of leaders who are able to build "capacities for transformation."

In a commercial culture whose tradition has been centered on economic materialism, visionary individuals in the economic development profession can become transformational leaders who help communities transform themselves to foster a healthy economy. Without a systemic approach to community transformation, there can be no effective shift to a sustainable Creative Molecular Economy that is based on continuous innovation, openness, and collaborative interlocking networks.

Simply stated, the business of economic development and its practitioners will be required to expand their focus beyond creating jobs through recruitment and retention. Rather, the responsibility of the economic developer

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is to help build better places in which to live, work, play, and run a business. Of particular importance will be an understanding of ideas, methods, and processes that are aligned with an emerging society and economy that is increasingly fast-paced, interconnected, and complex – in other words, economic developers will need to learn to focus on "comprehensive community transformation."

A SUGGESTED METHOD OF INTERLOCKING NETWORKS

We are moving from an Industrial Age based on hierarchies, standard answers and replication, and predictability to an Organic Age of interlocking networks and webs, multiple pathways leading to innovative solutions for emerging issues, and uncertainty and ambiguity. Although counterintuitive for many traditional economic developers (and many others as well), the lessons of how nature organizes its systems can be instructive as the Creative Molecular Economy emerges.

Nature's method of developing more complex systems comes through interlocking collaboration as well as competition. Dr. Lynn Margulis at the University of Massachusetts gained fame in 1970 when she suggested that the ability of prokaryotes to connect and collaborate created the first human cell. The principles of connection and collaboration become increasingly important as complexity emerges. Increasingly, economic developers will need to connect innovators, transformational learning concepts leading to a Future Forward Workforce, new communication technologies and their application, and crowd-sourcing ideas and funding for startups as the Creative Molecular Economy gains in importance.

If that last sentence does not sound like your current job description – that is the point of this article.

In a time of stress on any system (e.g. the Industrial Age), there appear networks of factors (in the case of a society or economy….people, new ideas, and multiple processes) that begin to work in collaboration. Such is the idea of "biomimicry" – the principle of interlocking networks mimicking biology.

Using this principle of biomimicry, it is suggested that multiple networks of interested economic developers be developed to work in collaboration to seed the concept of community transformation in local areas of the country. Simultaneously, there must be a shift in the field of economic development so that economic developers are seen as the leaders of a totally new approach to the future to include new concepts, new processes, new values, and new methods. Only if that occurs will citizens be more likely to allow and adopt various capacities for transformation that will be needed to insure a healthy economy and society in an era of constant change.

Change is scary for many people, to be avoided if possible. As a result, leadership by economic developers is an absolute necessity to help communities understand the need to build "capacities for a Creative Molecular Economy" using the concepts and methods of "comprehensive community transformation."

Growing beyond the context of our current economic development system, initially, three levels of interlocking networks will emerge:

1. Regional (both sub-state and multi-state)
2. State
3. National

To initiate and model these new concepts and methods of transformation, some places must lead by example. Some areas and their economic developers are already emerging as possible leaders of community transformation including the Charlotte Regional Partnership and the Panhandle of Florida as sub-state regional areas; Rhode Island and North Carolina as states…. the Heartland states (Iowa, Missouri, Oklahoma, Nebraska, and Kansas) and New England as multi-state regions. Within each are community-level collaboratives.

These areas can work both individually and in collaboration to bring the idea of systemic community transformation to the forefront and create interlocking networks of interested economic developers who are willing to commit the time and effort to learn how to be "Master Capacity Builders." It is important for any economic developer who is a part of this process to realize that he/she will need to be simultaneously involved in multiple con-

Change is scary for many people, to be avoided if possible. As a result, leadership by economic developers is an absolute necessity to help communities understand the need to build "capacities for a Creative Molecular Economy" using the concepts and methods of "comprehensive community transformation."

There is no magic wand that will move us from old-school transactional economic development to the new world of never-ending transformation. Linking the two is a necessary transitional process. Economic developers have a critical opportunity and responsibility to make this happen.

cepts of economic development (to include traditional business and industry attraction) as each learns this new approach to community transformation.

TRANSACTIONAL → TRANSITIONAL → TRANSFORMATIONAL

There is no magic wand that will move us from old-school transactional economic development to the new world of never-ending transformation. Linking the two is a necessary transitional process. Economic developers have a critical opportunity and responsibility to make this happen.

In so doing, the economic development profession can be the conduit for unleashing fundamental change as we transition from one type of society and economy to another.

" Digitization is creating a second economy that's vast, automatic, and invisible – thereby bringing the biggest change since the Industrial Revolution. Business processes that once took place among human beings are now being executed electronically. They are taking place in an unseen domain that is strictly digital. On the surface, this shift doesn't seem particularly consequential – it's almost something we take for granted. But I believe it is causing a revolution no less important and dramatic than that of the railroads. It is quietly creating a second economy, a digital one.

Is this the biggest change since the Industrial Revolution? Well, without sticking my neck out too much, I believe so. In fact, I think it may well be the biggest change ever in the economy. It is a deep qualitative change that is bringing intelligent, automatic response to the economy. There's no upper limit to this, no place where it has to end. What I am saying is that it would be easy to underestimate the degree to which this is going to make a difference."

– Brian Arthur
The Second Economy

clean energy

By Tracey Hyatt Bosman, CEcD

Championing clean energy is like playing chess with the pieces AND the squares constantly moving around. Multiple forces are at work shaping, pushing, and pulling the industry. Legislation is ephemeral. Polysilicon prices have been extremely volatile over the past five years. Cheap natural gas complements wind power as a back-up source when the wind stops but also competes with it for market share. Game-changing technology is an ongoing occurrence. The game pieces (or in this case, industry sectors) all have their unique strengths and limitations.

In chess, the object is to capture the opponent's king. In clean energy, the object is to provide alternative energy sources that will meet the world's insatiable (and growing) demand for electricity, as well as protect our environment. Many add energy independence as an objective here in the United States. Meeting these objectives will require masterful orchestration of all the pieces and perhaps sacrificing a few pieces along the way, especially as many of the "game pieces" are competing against their teammates as well as their opponents for funding and talent.

This article will touch briefly on some of the most salient squares (industry fundamentals), move on to the most dynamic and versatile of the game pieces (industry sectors), and close with some thoughts on how economic developers can successfully play the game.

The reader is invited to pay particular attention to the sidebar conversations regarding the often-overlooked suppliers of the industry sectors. When someone mentions alternative energy, companies like First Solar, Hemlock, Vestas, Acciona, Th!nk, and others come to mind. But these are just the most visible elements of clean energy. There are extensive, less visible "root systems" forming to support alternative energy. In fact, the interconnectivity of the sectors is comparable to the root system of a tree grove, where the root systems are connected and the entire group of seemingly individual trees is actually just one tree.

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THE SHIFTING GAMEBOARD

Politics

Ever-changing governmental incentives and policies (or a lack thereof, some would argue – especially at the federal level) make long-term planning nearly impossible.

According to Grubb and Ellis's Clean Energy Practice Group, at the state level, "California is consistently the trendsetter, but not all regulations are industry-friendly. Other states come in and out of stardom based on incentive programs. New Jersey enjoyed strong growth in solar installations during 2011, but Massachusetts and Connecticut are expected to join California as top destinations in 2012, with Rhode Island ramping up for 2013." *(Source: Grubb and Ellis 2012 Real Estate Forecast)*

Traditionally, alternative energy grows most rapidly during periods of predictability in federal government incentives.

There are currently four key programs impacting industry expansion in clean energy:

AN ULTRA-DYNAMIC GAME OF CHESS

Keeping pace with the rapidly-changing clean energy industry can be a real challenge. Successfully positioning a community to reap clean energy jobs and investment is an even trickier proposition. Understanding some of the less visible segments of the industry is one possible solution.

1. **Production Tax Credit (PTC) –** The renewable energy production tax credit was first passed in 1992 and has been heavily utilized since its inception. The PTC establishes a 10-year income tax credit of 2.2 cents per kilowatt-hour for electricity production from utility-scale turbines. Historically it has been renewed for only one to two years at a time, which does not allow for adequate project planning. For example, wind and solar generation projects require over a year of field testing before construction can begin. The current PTC legislation will expire on December 31, 2012.
2. **Investment Tax Credit –** The ITC was originally created by the Energy Policy Act of 2005 and later amended by the Emergency Economic Stabilization Act of 2008 and the American Recovery Act in 2009. It provides an uncapped 30 percent investment credit for residential and commercial solar projects.
3. **1603 Treasury Program –** The 1603 Program was passed in 2009 in response to an economy that was producing little in the way of tax liabilities from ailing corporations. Reduced tax liability due to the flailing economy meant a stagnant market for the PTCs and ITCs. Another means of incentivizing clean energy projects was needed. The 1603 Program allowed companies to elect a grant instead of a tax credit. The grants were equal to 30 percent of the qualified investment. Project construction must have begun by December 31, 2011 and be completed by the end of 2016 in order to qualify.
4. **Renewable Fuel Standard (RFS2) –** RFS2 sets national targets for the production of biofuels and is the key piece of legislation driving bioenergy. The current target is 36 billion gallons by 2022, which would equate to 15 percent of total transportation fuel consumption in the United States.

Clean energy companies strongly support these legislative initiatives and are constantly lobbying for their extension and/or expansion. The short-term (typically one to three years) and last-minute nature of the extensions is the biggest concern, as clean energy projects take multiple years to ramp-up, plan, and implement. Industry leaders argue they need a more stable landscape.

Transmission

"Currently, almost 300,000 megawatts of proposed wind projects, more than enough to meet 20 percent of our electricity needs, are waiting in line to connect to the grid because there is not enough transmission capacity to carry the electricity they would produce." (American Wind Energy Association)

Transmission constraints must be addressed if states are to achieve their renewable portfolio requirements, which IHS Emerging Energy Research estimates will require over 70 gigawatts (GW) of new renewable energy capacity by 2020.

China

The expansion of China's overall energy consumption is staggering. According to the International Energy Agency, China's consumption was less than half that of the United States as recently as 1990. In 2009 its consumption surpassed that of the U.S. and is on track to exceed it by 68 percent by 2035. *(Source: http://www.iea.org/index_info.asp?id=1479)*

Meanwhile, China is reputed to have taken over the title of the world's largest wind energy producer, and Forbes reports that China has gone from producing less than 1 percent of the world's solar panels in 2003 to producing over 50 percent by 2010. *(Source: http://blogs.forbes.com/kerryadolan/2010/11/30/the-china-clean-tech-divide-threat-or-opportunity/)*

Expect to see big growth in biomass in China, too. According to China Business News, the country plans to "expand its installed generation capacity of biomass power to 13 million kilowatts by the end of 2015. The figure doubled the former goal proposed by the China Electricity Council and is even higher than the planned installed capacity of solar power." *(Source: http://www.chinadaily.com.cn/business/2011-07/11/content_12878618.htm)*

Investment Capital

If the sustained deployment of capital into an industry is a measure of the industry's long-term viability and health, clean tech is doing well, with clean energy specifically leading the way. Because so many of the technologies, facilities, and companies in clean energy are new, venture capital has been a key ingredient to the industry's growth.

- According to Clean Tech Group, clean tech venture investments totaled $2.14 billion in Q3 2011. This was an increase of 6 percent over the previous quarter and 18 percent over the same quarter last year. *(Source: http://research.cleantech.com/resources/)*

Courtesy of DOE/NREL, Photoshop work performed by Raymond David

Transmission infrastructure constraints represent one of the biggest challenges to the future of renewable energy.

Key supply chain link: Inverter manufacturers

Inverters are needed to convert the energy by solar panels to alternating current electricity, which is then transferred to transmission power lines.

The inverter market has been tumultuous over the past several years, but the overall trend is growth. Recent statistics from IHS's PV Inverter Market Tracker indicate photovoltaic (PV) inverter shipments declined slightly in 2011 but will rebound to 5 percent growth in 2012 and more than double by 2015. *(Source: http://www.isuppli.com/Photovoltaics/Pages/PV-Inverters-Surviving-the-Storm.aspx?PRX)*

Power-One, the second largest manufacturer of solar power inverters globally, recently opened manufacturing centers in Phoenix, Arizona, and Toronto, Canada.

According to IMS Research, unlike all other aspects of PV manufacturing, inverter assembly is labor intensive and not reliant on manufacturing equipment. Supply and demand dynamics can be adjusted quickly via workforce reductions and additions when necessary.

At the same time, large central inverters "are typically highly engineered, with advanced functionality and design which attract healthy margins and also prevent low-cost competitors from stealing market share," says Ash Sharma, PV research director at IMS Research.

Courtesy of DOE/NREL Credit – Williamson, Robb, NREL Contract Photographer

Inverters and battery storage for photovoltaic system

- New Energy Finance reported global investment in clean energy and carbon markets was up 30 percent in 2010 over 2009, representing the highest investment since New Energy Finance started tracking the data in 2004.
- Drawing on data from Dow Jones VentureSource, Ernst & Young LLP reported a 73 percent increase overall in U.S. venture capital investment in clean tech in Q3 2011 versus Q3 2010, with fuel cell and energy storage companies accounting for the largest portion of the $1.1 billion total.

WHICH GAME PIECES ARE ON THE MOVE?

Solar Generation

In chess, the knight is the most unusual piece. Because it can move in an L-shape pattern in any direction, one square forward and two to the side OR two squares forward and one to the side, it is arguably the most versatile piece on the board, especially as it is the only piece that can jump over any other piece, making it particularly useful on a crowded board.

Likewise, solar has shown great versatility. It can be deployed to heat a swimming pool or residential home or a large manufacturing facility. Large solar farms provide utility-scale generation, but solar technology can also power everything from hand-held calculators to desk lamps to traffic lights.

As with any young industry, solar has experienced and will experience transitions and consolidations, as illustrated by the well-publicized bankruptcies of Solyndra and Evergreen. While these events have implications for the federal financing programs that had invested in the companies, a certain degree of fall-out is to be expected as technologies and business models are proven or fail. The failure of a few companies should not be interpreted as an omen for the entire industry.

The precipitous decline in polysilicon prices, while bad for the polysilicon sector, has improved solar's competitive position in the race for parity. Clean Edge projects "installed solar PV [photovoltaic] costs in the U.S. – without subsidies – will be competitive with residential electricity prices in more than half the states by 2020."

The growth in solar is not just about the solar panel manufacturers and the polysilicon plants. A lot of components and technology are required as well. Engineering companies are needed to do the resource field testing and IT specialists to design the monitoring systems.

- Shoals, which makes solar panel components, set up shop in Gallatin, TN, a couple of years ago.
- Xtreme Power is another rapidly expanding company, headquartered in Kyle, Texas, and manufacturing at multiple, U.S. locations. It designs, engineers, manufactures, and operates integrated energy storage and power management systems.
- Draker Labs of Burlington, VT, provides monitoring solutions for commercial and utility-scale PV systems.
- Unirac, based in Albuquerque, makes PV mounting systems and is doing very well. It just opened a manufacturing plant in Ontario, CA.

Wind Generation

The bishop, like wind energy, is a foundational part of any strategy. The bishop can move on any diagonal, for any distance, making it both powerful and flexible. However, it is limited to half of the squares on the board, either the black or the white. Likewise, wind generation is more limited than some of the alternative energy sectors in that not all locations have sufficient wind resources.

Offshore is a growing segment of the wind industry.

Wind energy has been around since before the industrial age and is arguably the largest and most established of the alternative energy sectors.

Bloomberg New Energy Finance predicts wind energy will be competitive with natural gas by 2016. *(Source: http://www.renewableenergyworld.com/rea/news/article/2011/11/wind-electricity-to-be-fully-competitive-with-natural-gas-by-2016-says-bloomberg-new-energy-finance??cmpid=WNL-Wednesday-November16-2011)*. Pike Research predicts a doubling of total installed wind capacity in North America over the next six years. Community and offshore wind are growing in importance and market size.

As mentioned earlier, though, we need to look beyond the big wind farm developers and turbine manufacturers to see the full impact of the growth of this sector. Metal components make up nearly 90 percent of the weight and over one-third of the value of a wind turbine. The annual demand for turbines is projected to double during the next few decades, which means we're going to need forges, foundaries, fabricators, machine shops, and integrators.

Companies like Vestas, Nordex, and Iberdrola have been working hard to build up the supply chains they need here in the states.

Key supply chain link: Repair and parts distribution facilities

There will be greater demand for consolidated parts warehouses and repair facilities to service large, even multi-state jurisdictions rather than a particular farm. These facilities will need strong floors, big cranes, and high clear heights.

Smart Grid Technology

Like the queen, smart grid technology is clearly the most powerful force on the clean energy game board. It is the lynchpin of any clean energy strategy and all sectors – building blocks on which all of the clean energy sectors depend, and arguably traditional energy sources, as well. It's comprised of meters and software and monitoring systems, all integrated to provide optimal distribution and consumption of electricity.

Smart grid technology is what will make it possible to effectively utilize distributed energy generation (think solar panels on residential roofs feeding energy to the grid and wind energy generation in one region meeting another region's demand) and integrate energy-saving demand management features for appliances and systems at home and work.

Bloomberg New Energy Finance refers to smart grid technology as Digital Energy, citing "Digital energy is about the convergence of the traditionally unconnected energy, telecoms and information technology industries." Even more succinctly, a Duke Energy spokesperson says, "The 21st century electric company is a technology company disguised as a utility." *(Source: Duke Energy: Today's utility a technology company in disguise - FierceEnergy http://www.fierceenergy.com/story/duke-energy-todays-utility-technology-company-disguise/2011-04-26#ixzz1OFqWQCCp)*

Smart grid demonstration projects are occurring across the United States. Take for example the Pacific Northwest Smart Grid Demonstration Project (PNW-SGDP). PNW-SGDP is one of 16 smart grid demonstration projects funded by the U.S. Department of Energy. It incorporates many of the key functions of the future smart grid across 60,000 metered customers and five states (Idaho, Montana, Oregon, Washington, and Wyoming).

Many smart grid companies look like technology companies, incorporating sophisticated software to design and monitor smart grid systems:

- ***Consert:*** *smart grid technology provider,*
- ***SmartSynch:*** *smart grid infrastructure company,*
- ***Powerit Solutions:*** *energy management systems, and*
- ***Alstom:*** *converters.*

Key supply chain link: Managed services

Pike Research anticipates smart grid will create a sizable new market for managed services in the utility sector. They estimate it will increase from $470 million in annual revenue in 2010 to nearly $4.3 billion by 2015.

We're seeing players from several different industries, such as the IT sector, the communications product and services sector, and the manufacturing sector. Key categories of managed services players include the following:

1. Telecom providers like Alcatel-Lucent, AT&T, Ericsson, Verizon, and others.
2. Large traditional IT companies such as Accenture, Capgemini, CSC, HCL, IBM, Lockheed Martin, SAIC, Siemens, Wipro, and others.
3. Smart grid companies including Itron, Tendril, Trilliant, and others.
4. Application outsourcing providers such as Comverge and EnerNOC.

(Source: http://www.pikeresearch.com/research/smart-grid-managed-services)

Courtesy of DOE/NREL, Credit - Warren Gretz

Flywheel technology is one possible technology for storing energy. It is based on transferring the energy to a kinetic battery spinning at very high speeds. When the flywheel is slowed, the energy is released.

Battery Technology

One of the biggest challenges to distributed energy generation is the intermittent nature of it. The sun isn't always shining and the wind isn't always blowing. How can we store energy when we can make it and save it for those times when we can't? Battery technology will be the lynchpin in solving this issue. It can be likened to the rook in chess because its ability to cover and integrate the entire board illustrates its role as a foundational element of renewable energy.

While no one technology owns this sector, flywheel seems to be one of the most promising, with companies like Beacon Power and VYCON earning a lot of interest.

Electric Vehicles

Electric vehicles (EVs) represent the other rook. Electric vehicles have great potential, as well, and are likely to become an integrated piece of the equation.

Since 2009, the U.S. Department of Energy has invested over $5 billion to spur growth in electric vehicles and related battery manufacturing. Bloomberg New Energy Finance estimates plug-in electric vehicles could make up 9 percent of auto sales by 2020.

While the Midwest has seen significant investments from EV manufacturers, in the last few months, two manufacturers established U.S. headquarters in Los Angeles: China-based BYD and Coda Automotive. *(Source: http://www.linkedin.com/news?viewArticle=&articleID=922451026&gid=2582646&type=member&item=81366797&articleURL=http percent3A percent2F percent2Fwww percent2Escpr percent2Eorg percent2Fprograms percent2Fmadeleine-brand percent2F2011 percent2F11 percent2F18 percent2F21460 percent2Felectric-car-manufacturers&urlhash=nX9u&goback= percent2Egde_2582646_member_81366797)*

Of great interest is the massive infrastructure shift that will be required to accommodate adoption of EVs, including specialized fueling stations and fueling docks in gas stations, parking lots, personal garages, and corporate campuses. Over 1,800 electric vehicle chargers have been installed under the Recovery Act by Coulomb Technologies, ECOtality, General Motors, and others.

Wireless charging, called inductive power transfer (IPT), could leap frog the entire charging station demand. Companies like HaloIPT and Siemens/BMW are testing IPT systems that use magnetics to transfer energy from a pad on the ground to a pad in the EV. Parking an electric car over the pad, or even just driving over it, is all that is required for an immediate, full charge. The magnetic pads could even be put directly in roadbeds, allowing EVs to keep rolling indefinitely.

GLOSSARY

Biomass – Renewable organic materials, such as wood, agricultural crops or wastes, and municipal wastes used as a source of fuel or energy. Biomass can be used directly (incineration/burning) or converted into biofuels such as ethanol and methane.

Biomass gasifier – Piece of equipment that heats the biomass to high temperatures to create "syngas" (synthetic gas), which can then be combusted as a fuel.

Distributed energy generation – Generation of electricity from many small sources in various locations as opposed to large, centralized sources such as coal and nuclear power plants. Examples of distributed energy generation include residential and industrial rooftop solar installations, small wind turbines, and fuel cells.

Feedstock – Biomass materials used to generate bioenergy, including corn, sugarcane (ethanol), algae, woody products, soybeans, and oilseeds.

Grid – Electric infrastructure for transmission and distribution of electricity, including network of power lines and accompanying equipment.

Incineration – The most common waste-to-energy technology, consisting of combustion of waste to create heat which in turn is used to boil water and power steam generators to make electricity.

Inverter – An electrical component that converts the variable DC output from solar panels into AC power that can be fed onto the grid.

Parity – The point at which renewable energy prices become competitive with the retail rate of conventionally-sourced energy. Parity is typically discussed as occurring "in the absence of subsidies for the renewable energy," although many would argue that conventional sources of electricity are also subsidized.

Photovoltaic (PV) solar – Generation of electricity through the use of solar panels and semiconductors to convert sunlight into electricity. Photovoltaic solar is one type of solar technology. The other most common technology is concentrated solar power (thermal solar), which uses mirrors to focus sunlight into a single beam which is then used to heat water and, in turn, the heated water can be used to create electricity.

Plasma gasification – A waste-to-energy technology which converts the biomass into a plasma and creates two by-products: glass-like substances which can be used for household tiles and syngas (synthetic gas) which can be converted into ethanol, natural gas or other fuels.

Pyrolysis – Pyrolysis involves the thermal decomposition of biomass. It is related to combustion and gasification but occurs earlier in the chemical reaction process. By-products include biochar, bio-oil, and syngases.

Courtesy of DOE/NREL, Credit - IKEA Orlando

Solar powered charging station for electric vehicle.

And it's not just the manufacturers of the chargers, but the companies, like Evgo, that are packaging the charging services with the hardware. The sum of $89/month buys you an installed home dock and a key card that gives you access to all public charging stations, called Freedom Stations. These Freedom Stations are going into the parking lots of places like Walgreens and Best Buy. So far, the concept has been launched in Houston and Dallas/Ft. Worth.

Bioenergy

While solar technology was likened to a knight because of its versatility, bioenergy can be likened to a knight because of its unpredictability. Bioenergy has a number of factions (including biomass, biogas, and biofuels), any or all of which have the ability to expand rapidly under the right conditions. The question is whether they will have the luxury of the right conditions – namely favorable government policies, incentives, and regulations, as discussed earlier in this article – and, if they do have the luxury, which sectors will move the fastest.

Many are expecting big things from the biofuels sectors, with significant demand coming from the U.S. military. A number of conversion technologies are proving viable.

Biomass refers to any number of materials related to living organisms that can be burned to create energy. These materials include everything from wood pellets to manure to municipal waste to crop "leftovers." These materials can be burned directly to create heat and/or power turbines and gasifiers which create electricity, or they can be converted into fuels which are then burned to power vehicles and equipment.

Many are expecting big things from the biofuels sectors, with significant demand coming from the U.S. military. A number of conversion technologies are proving viable.

According to RISI, a U.S.-based research and information firm that focuses on the forest products industry, "In both the U.S.A. and Canada, national policies have been much more heavily focused on developing biofuels production rather than biomass heat and power. The focus on biofuels is founded on national security concerns in the U.S.A., due to a heavy reliance on imported oil." RISI expects the wood-fired energy sector to have the largest share of bioenergy development, as measured by tons of biomass consumed. *(Source: http://rpn.baumpub.com/opinions/221/the-bright-future-in-biomass)*

However, the biofuel sector faces feedstock challenges. Use of food crops drives food prices higher and results in consumer outcry. Even with non-food crops, agricultural techniques are under pressure to be sustainable and minimize water consumption. Fortunately, non-food crops such as jatropha and oil from algae are showing great promise.

Anaerobic Digesters

Anaerobic digesters capture methane gas (the main "ingredient" in natural gas) from manure. Biomass Magazine reports anaerobic digesters (biodigesters) are on the rise, with the annual kWh output quadrupling between 2001 and 2007. *(Source: http://biomassmagazine.com/articles/3009/biomass'--role-in-the-energy-future)*

BioCycle offered these statistics as of April 2011:

- 167 currently operating digesters in 33 states
- 137 dairy, 23 swine, 5 poultry, 2 beef
- Top 5 states (in terms of total number of operating digesters): Wisconsin – 26, New York – 23, Pennsylvania – 19, California – 14, Vermont – 10. (Pennsylvania has had the most new systems become operational in the past year)
- 156 farm-scale, 11 centralized/regional
- Energy generation in 2010 was 453,000 MWh equivalent (compared to 374,000 MWh in 2009)

(Source: http://www.jgpress.com/archives/_free/002318.html)

Waste-to-Energy

The marriage of alternative energy generation with waste management makes a very interesting marketplace. Waste-to-energy provides benefits to both partners. In

Biomass uses organic materials and wastes to create energy.

economic terms, the demand for waste management is highly inelastic and not subject to cyclical forces, which helps to stabilize the still-turbulent alternative energy market. Meanwhile, landfill sites are increasingly difficult to come by and minimizing the amount of material sent to a landfill is a complementary sustainability initiative that pairs well with the desire to create renewable energy sources. In other words, waste-to-energy is attractive across a wide range of factors.

A recent report from SBI Energy projects markets for various waste-to-energy technologies (including incineration, plasma gasification, pyrolysis and anaerobic digestion) to grow at a rate of approximately 11 percent over the next 10 years. *(Source: http://rpn.baumpub.com/opinions/219/waste-to-energy-on-the-rise by Keith Barker, Recycling Product News, April, 2011)*

Biomass Suppliers

Growth in the biomass marketplace obviously means growth for its supplier base. The most critical suppliers are obviously the feedstock sources – waste collection organizations, farmers, etc. But the industry also requires gasifiers, grain handling equipment, wood grinders and chippers, piping, boilers, generators, and specialized design and construction firms. Most of these companies are not dedicated exclusively to biomass, which makes it difficult to find a centralized listing. Sponsor and exhibitor listings for biomass trade shows can provide insight on whose targeting this sector.

Energy Management

Comparing energy management (efficiency) to a pawn may seem belittling. However, while a single pawn is the weakest chess piece, there are more of them than any other piece. Likewise, any one energy efficiency technique deployed in a single building or home is not tremendously significant, but when taken in aggregate, energy management initiatives can be transformative. After all, the cleanest energy is the energy not used.

While smart grid, described earlier, is the most dynamic sector within energy management, efficient lighting, window tinting, and other approaches to energy management are also being increasingly adopted. As the discipline of energy management moves to the mainstream of everyday business, energy efficiency and renewable energy generation become two points on the same continuum. Users increasingly intermingle these two approaches in their efforts to lower energy costs.

HOW SHOULD ECONOMIC DEVELOPERS PLAY THE GAME?

Economic developers are being asked to foresee the unforeseeable in order to position their community and businesses for the future. Getting it wrong means making the headlines if you support a company or technology that doesn't make it. ***Not*** making the headlines can be just as bad, if your stakeholders are expecting you to cash in on this "obvious" clean energy trend they're all reading about in the media.

Do we know what the world will look like in five years? No, but we know it won't look like what it does now. So if you do nothing, you're ***guaranteed*** to fall behind. If you do ***something***, you have a chance of getting at least some things right.

As with all economic development efforts, understanding what you have is the first step. In your inventory of current activities and companies, take a close look at universities and military installations, as they will frequently be active in the clean energy sector.

Given the fluctuation in the industry, the temptation is to use a shotgun approach. Resist that temptation and try to specialize according to your community's existing assets and/or capacity to build key assets. Not all areas are a good fit for wind energy generation or polysilicon manufacturing, but clean energy's breadth offers opportunities for virtually any kind of community. Bioenergy is particularly well-suited for rural areas, and smart grid manufacturers can be found throughout the country.

As with all economic development efforts, understanding what you have is the first step. In your inventory of current activities and companies, take a close look at universities and military installations, as they will frequently be active in the clean energy sector.

One of the smartest, easiest things economic developers can do to stay in the game is to avoid fixating on the "tip of the iceberg." While the polysilicon plants, turbine assembly operations, and solar panel manufacturers are clearly the big trophies, these projects will be few and far between in the grand scheme. Meanwhile, suppliers, service providers, engineering companies, software companies and the like are all finding that their business is being increasingly driven by the clean energy industry. Understanding which companies in the community are likely to experience growth from this segment, and particularly identifying those that could benefit if given a bit of technical or financial assistance, is an important role for economic development.

Clean energy companies are exceptionally involved in political matters related to energy. This creates a number of reasons for economic developers to be involved as well. Obviously, economic developers will want their state and local regulations to be as favorable as possible. It's also simply good PR to demonstrate your commitment to the industry. Likewise, economic developers can lead local efforts to establish favorable permitting conditions and interconnection agreements.

One of the more interesting dynamics in clean energy is the ability of the government to use incentives and regulations to create demand, be it for solar installations, electric vehicle usage, or fuel cell deployment. Some communities may elect to take their clean energy initiatives to the next level by incorporating some of these "carrots."

It would be foolhardy to focus on growing your clean energy sector without working hand in hand with your utility provider(s). As the largest customers of the clean energy companies, as well as providers to the related manufacturing facilities, utilities are an inextricable part of the equation. Depending on the structure of the utility, economic developers may find they need an additional contact beyond their traditional economic development liaison, as the purchasing side of the business is historically not the domain of the utility economic developer.

Demonstration projects are one possible way of demonstrating a community's commitment to clean energy while earning media coverage. Consider for example Indianapolis's Project Get Ready, which is focused on accelerating the market introduction and penetration of electric vehicles and related technologies in the Indianapolis region. The project builds on and complements the electric vehicle manufacturing and battery technology development already occurring in Indiana.

For those that have the scale to recruit new investment at a national or international level, trade show attendance is a must. Clean energy trade shows attract the decision makers and typically offer a great opportunity to network and learn about who's doing what.

Investment recruiters will also want to keep a close eye on European companies, as Europe can be characterized as the cradle of the clean energy movement. Meanwhile, China and India are hotbeds of growth.

Don't forget the larger sustainability movement that encompasses clean energy. Economic developers may find opportunities to assist local companies in reaching their sustainability goals and reducing energy bills by ***deployment*** of clean energy applications, such as rooftop solar or on-site fuel cell generation. This may be the biggest value-add opportunity for economic developers in communities that are not well-positioned to target clean energy manufacturing or generation projects.

Most importantly, economic developers can't think about clean energy as an encapsulated industry. It represents a fundamental shift in the way we power our homes, businesses, and transportation modes. Its implications will touch everyone in some way. The economic developer's challenge is to recognize the economic changes being driven by clean energy and to help his/her community visualize future implications and opportunities.

turning coal into DIAMONDS

By Karl R. Dorshimer, CEcD, EDFP

A POWERFUL HISTORY

In 1937, the decision by city leaders to build a large coal burning power plant on the Grand River in the middle of downtown Lansing, Michigan, made good sense. Chosen as the location for the state capitol in 1847, Lansing had grown from a cluster of log cabins on the longest river in Michigan to a city of 78,000 residents in 1930. Along the way Michigan State University, the nation's first land grant university, was established nearby, and Ransom Ely Olds, an early entrepreneur, created the Oldsmobile Motor Vehicle Company near the banks of the river. Olds, who built his first steam car in 1894 and his first gasoline powered car in 1896, is credited with inventing the concept of the assembly line and used it in 1901 to build the Oldsmobile Curved Dash, the first mass-produced automobile (Michigan Yesterday & Today by Robert W. Domm).

In the decades leading up to 1937, the river had become lined with industry and evolved from being a source of fresh water, fish, and transportation, to an industrial input for cooling and a convenient mode of waste disposal. The river once rich in natural resources had reached the point where it was no longer fit for human contact.

However, in the late 1930s with the economy rebounding from the first Great Recession, Lansing began to ride high on its economic sectors of industry, government, and higher education. World War I was a fading memory and Lansing was making the transition from small town to city. The population more than doubled between 1910 and 1937 and the city's existing older power plant was overwhelmed by a rapid surge in demand for electricity by residents, institutions, businesses, and industry. To meet this demand, the city made the decision to build the Ottawa Power Station. However, this was the age of great public works and the plant was not going to be ordinary. Times were finally good and the sky was the limit. This plant would be a statement to the world that Lansing had succeeded in the industrial age. To design such a building, the city selected the firm of Edwyn Bowd and Orlie Munson. The firm designed an art deco exterior of brick and windows that was shaped like a wedding cake but made out of long rectangles instead of circles. Each layer was set on top of the previous one until the building reached ten stories in height. The exterior colors were intended to represent the transformation of coal into flames and light.

Photo courtesy of IBEW.

Ottawa Power Station under construction in 1940s.

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THE OTTAWA POWER STATION REDEVELOPMENT PROJECT

An IEDC Excellence in Economic Development double award winner, this project transformed a vacant and contaminated ten-story, former coal burning power plant into the world headquarters of the Accident Fund Insurance Company. The brownfield redevelopment project combined the renovation of an historic power plant with the construction of a new contemporary office building, to create results that are both visually stunning and extremely functional. A long list of physical, environmental, and economic barriers were overcome to complete the $182 million project, which retained 600 jobs and created 500 positions. The project served as a catalyst to generate additional retail, commercial, and residential development that is transforming downtown Lansing, Michigan.

Lawrence Cosentino of the Lansing City Pulse describes how the walls rise "upward from the river, the masonry changes in color from coal-black granite at the bottom, radiating into waves of purple-gray, red, orange and yellow brick. The colors do not change in distinct layers, but gradual, Impressionist graduation, with outliers dispersed to enhance the illusion of flame. Thus the exterior of the plant is both a monumental sculpture and a fluid painting..."

Photo by Gene Meadows.

Inside of Power Station prior to redevelopment.

Half completed in 1939, the Ottawa Power Plant was delayed in completion by World War II, and the other half built in 1946. Continually upgraded and improved as technology changed, the plant burned coal to produce both steam and electricity for downtown Lansing as the city grew during the 50s and 60s. However, during the 70s another plant took over Ottawa's steam generating tasks, and the aging beauty started to show signs of age. A newer more efficient power plant was built on the outskirts of Lansing, and an upgraded electric grid system enabled the city to be less dependent upon the old plant. At about this same time, the city expanded an adjacent public parking ramp over the road that fronted the plant and blocked its view from downtown.

The final blow came when stricter environmental regulations and unfavorable market conditions caused the plant to be decommissioned in 1992. The city continued to use the steam distribution system in the building to disperse steam piped in from a newer power plant to various customers in the downtown area. Gradually, the power plant became a silent and conspicuous reminder of Lansing's past glory days and loomed over a struggling downtown.

THERE IS NO MAGIC BULLET

Through the 90s the plant stood idle but with much of its equipment and boilers still inside. The city made it known that the plant was for sale and had high hopes that a potential purchaser would come forth. However, most of the interest was from dreamers and not of a serious nature. There were a few serious developers with mixed use proposals, but all fell by the wayside when the projects progressed to the financial feasibility phase.

Even Earvin "Magic" Johnson, Lansing's native son and Hall of Fame professional basketball player, could not put together a deal to make the building into an entertainment center. It became obvious that the building presented major redevelopment challenges that were way outside of what was normally found in a brownfield project.

THE BIG CHILLER

When it became clear that the plant would not be re-commissioned and no developer or business was going to purchase the property, the city's municipal utility company (Lansing Board of Water and Light) removed all the machinery and boilers to make the property more appealing. What this did was create a huge cavernous interior that was dark, cold, and dangerous. Pigeons, falcons, and raccoons soon took over the upper reaches of the building, giving it a post-apocalyptic look and feel. Several more years passed with no end user in sight, and the city saw an opportunity to use the building for another purpose.

In 1998, the Lansing Board of Water and Light (LBWL) needed to locate a large 10,000-ton chilled water plant in downtown Lansing to serve the state of Michigan's building complex and the new General Motors Grand River Assembly Plant. The assembly plant, GM's first new plant in the U.S. in generations, was built in 1999 on the former Oldsmobile manufacturing site along the Grand River upstream from the downtown area. The site, once the location for the Michigan State Fair, had been the historic epicenter of Oldsmobile where more than 14 million Oldsmobiles were produced over a hundred-year run.

Built in 1999, the 2.5-million-square-foot Grand River Assembly (LGR) plant, a $550 million brownfield redevelopment project, thrust Lansing back into the U.S. lead in modern manufacturing. The LGR employs 2,000 people and has a major economic impact on the Lansing economy. The LBWL wanted to build a chilled water

2006 – pre-redevelopment view of plant with parking ramp and chiller cooling towers blocking access.

plant between downtown and the new LGR plant. However, the location selected drew heavy criticism from adjacent property owners. The chilled water plant would use massive compressors driven by steam or electricity to produce chilled water to be piped underground to customers who use the cold water in their air-conditioning units to cool large buildings. The used and now warmer water is then looped back to the chilled water plant where it is cooled back down and sent back around the loop again.

The process of stripping the heat off the loop at the chiller plant uses evaporation in several large cooling towers. These cooling towers produce both noise and a large amount of steam. When the steam comes in contact with an adjacent building, it condenses and forms either water or ice depending upon the outside air temperature.

When opposition to the chosen location reached a large and uncompromising level in late 1999, the LBWL found a second location that was under their control, well buffered from private land owners, and tall enough to get the steam plume high in the air – the Ottawa Power Station. So steam driven compressors were installed in the vacant plant and a massive and unsightly cooling water tower system was attached to the roof of the building. The combination of the encroaching parking ramp and the cooling towers effectively hid the building from view and made it even less appealing from a redevelopment standpoint.

Thus midway through the first decade of this millennium, the inside of the Power Station was covered in soot, coal dust, lead paint, and contained asbestos caulk. There were steel beams and cross supports, and the compressors took up a large portion of the interior space. To complicate matters even more, there was a privately owned building located in the middle of the six-acre site. Additionally, the extent of environmental contamination was unknown and associated liability issues not fully resolved. It all added up to a property that appeared impossible to redevelop.

THERE'S A NEW MAYOR IN TOWN

In 2006, Virg Bernero was elected mayor of Lansing. Mayor Bernero, who came into office on a platform of pro economic development, beefed up the Lansing Economic Development Corporation (LEDC) with more city funding and hired Bob Trezise, Jr. as the new LEDC president and CEO. After achieving several small successful development projects in the city, the new mayor set his sights on the 10-story behemoth in the downtown.

The city's attitude toward the Grand River had come full circle from the mid-1800s, and the river was once again considered a positive natural asset. The Clean Water Act of 1972 along with a strong state environmental department had over the previous 30 years eliminated most of the sources of pollution entering the river. The river was also naturally cleaning itself up and no longer considered hazardous to come in contact with. The planting of salmon in the river along with the resurgence in native fish populations provided recreation opportunities for fishing. The cleaner river also became popular for canoeing and kayaking.

The city started embracing the river with the construction of the Lansing Center in the 1990s and the establishment of an entertainment district along the east bank. Thus it was logical to look across to the west bank and see the former coal burning power plant rising up over the river and dare to dream about it as a diamond in the rough. However, the power plant building would be the mayor's and LEDC's supreme challenge. In an effort to redevelop the building, LEDC put together a Request for Proposals (RFP) for the property. On June 14, 2006, LEDC released the RFP. There was a major effort to distribute the RFP as far and wide as possible to generate interest from national and even international developers.

LEDC used the Internet, social media, conventional media, and various professional real estate networks to spread the word. The RFP went to great lengths to describe not only the physical attributes of the building but the wide array of development incentives and tax credits available for the project. Included in the RFP was a link to the LEDC website where additional detailed information was available including the environmental assessment work on the entire site.

There was an initial flurry of interest and LEDC even conducted tours of the property. However, as the deadline for submitting development proposals neared, it became clear that there were many tire kickers but none se-

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rious enough to spend the time and effort to put together a serious proposal. The day before the deadline, a local developer called LEDC and said he knew a company that was interested in the site. The local developer was encouraged to send at least a letter of interest to get his foot in the door. That letter represented the disappointingly low results of the LEDC RFP efforts.

THE HARDEST THING TO FIND

The local developer, Chuck Abraham, had a friend in a high place, Blue Cross Blue Shield of Michigan's President Dan Loepp. This link would prove to be an incredible stroke of good fortune. After searching far and wide for a developer or company to take on the Ottawa Station project, could it be that the solution was right under the city's nose?

Blue Cross Blue Shield of Michigan (BCBS) was no stranger to urban redevelopment, having rehabilitated a building in downtown Grand Rapids, Michigan, in 2004. BCBS was looking for a new location for a subsidiary company, the Accident Fund Insurance Company of America (AFICA). AFICA, already located in downtown Lansing, was outgrowing their location with 600 employees and expecting to hire another 500. They were looking at both in-state and out-of-state sites for relocation.

At the time, even though the Ottawa Station site was visible out their windows only four blocks away, they had not even considered it as a possible location. The power plant with its massive smokestack, steam belching cooling towers, blocked off access, and contaminated soils seemed a far cry from their image of a health insurance company's world headquarters.

However, Abraham was the master of the soft sell. Consulting with LEDC, he kept putting the issue at every opportunity in front of Loepp, who had previously worked in downtown Lansing and was familiar with the building. When Loepp learned about the various development incentives and the public sector's strong desire to redevelop the power plant, he asked Abraham to set up a confidential tour of the building for his facilities people.

MARGE AND HOMER SIMPSON COME CALLING

Abraham contacted Bob Trezise of the LEDC in fall 2006 to let him know that his prospective tenant for the project wanted to tour the site. Trezise and the author (then LEDC vice president) quickly arranged an onsite tour. At this point, the identity of the potential user was unknown to LEDC. As introductions were made, the two company representatives asked to remain confidential and requested for conversational purposes to please refer to them as Marge and Homer Simpson.

During the tour, both Marge and Homer had a lot of questions regarding the current status of the building. They were particularly interested in the chilled water and steam systems and the parking ramp next to the plant. LEDC staff were pleased to tour the property with people who were asking "what if" and "how to" questions rather than the typical negative kind of responses from past prospect tours. The representatives seemed to be tasked with taking a look at the building and trying to figure out if it really could work for them.

THE CITY GETS CHALLENGED

One month after the Simpson's visit, Mayor Bernero received a phone call from Dan Loepp of BCBS who told the mayor that Marge and Homer were his facilities people and they saw potential in the old power plant. He told the mayor that if the city could meet his demands, the Accident Fund would locate its new world headquarters in the power station. His demands for the city and developer were:

- Remove & relocate the chilled water system,
- Dismantle and remove the smokestack,
- Demolish the parking ramp over Grand Avenue,
- Assemble the properties and sell the site,
- Demolish adjacent older buildings,
- Mitigate lead & asbestos,
- Assess and clean-up soils,
- Rehabilitate the power plant,
- Build another 100,000 sf building on site for additional space,
- Construct a 1,000-space parking facility for employees, and
- Make improvements to the riverfront.

Photo by Ike Lea.

2008 – city parking ramp and chiller cooling towers under demolition.

2009 – plant under restoration and steel going up for adjacent office building.

The view of the finished project from the Grand River.

THE PHOENIX PROJECT TEAM IS FORMED

Mayor Bernero relayed the good news to the LEDC and they along with the company's chosen developer (The Christman Company) gathered together a team of public and private sector experts to work on meeting the challenges issued by Loepp and the Accident Fund. The team members included staff from the city, utilities, state & federal departments, plus environmental and legal firms. Since the project was still confidential, it was code named the Phoenix Project.

At one of the team's first weekly meetings, the experts pointed out the reality of the challenges:

- The Lansing Board of Water and Light still owed $30 million on the chilled water system.
- Because of changes in technology, the scrap value of the chilled water system was minimal and scrapping the chilled system would eliminate the revenue but leave the debt.
- The construction of a new chilled water system would cost $20 million or more.
- The steam distribution system would be expensive and difficult to relocate.
- The portion of the city parking ramp to remove was over a major downtown street that needed to be shut down for an extended period of time.
- The smokestack would be expensive and difficult to disassemble.
- The city did not control ownership of the entire site, with a privately owned parcel almost bisecting the property right in the middle.

Team members left this initial meeting very discouraged, after which one member coined the term "the chiller is the killer."

THE TEAM TACKLES THE CHALLENGES ONE AT A TIME

The Project Team concluded the challenges had to be solved one at a time. The Christman Company, the developer and potential general contractor, conducted preliminary design and engineering work to rough out the construction components of the project. The first part would be the remediation and redevelopment of the power plant building. The second component was the construction of an adjacent, modern 100,000-square-foot four-story building. This adjacent building was necessary because the renovated power plant would not have enough room for the anticipated 1,100 or more workers. Adding directly onto the power plant would compromise its architectural integrity and historic nature. Thus, the new building would be connected by enclosed walkways at several levels. Finally, there was the 1,000-space parking ramp to be built on site. Christman was able to lay out the development and prove to Accident Fund that the site was capable of housing the type of headquarter campus they desired.

Meanwhile the Project Team started working on the assessment of the existing contamination on site. Conducting the environmental assessment was accomplished by using an EPA assessment grant previously awarded to the Lansing Brownfield Redevelopment Authority (LBRA). There was also a survey inside the power plant to assess any hazardous materials present there. The results of the environmental work showed the presence of some contamination in the soils from the storage of coal plus lead paint and asbestos window caulking in the power plant.

The good news was that no "deal killer" contamination was discovered. The bad news was that remediation costs were going to add to the overall costs of the project. The LBRA was able to offer EPA remediation funds to take care of these newly discovered environmental costs.

LBRA was also able to secure grant funds from the Michigan Department of Environmental Quality (MDEQ) for riverfront improvements to improve public access. Under the city's charter, the first 25 feet of land along the river must be retained in public ownership. Only with the approval of the voters can this buffer of land be sold. In Lansing this strip of land is used for a river trail system that is very popular with residents, visitors, and downtown workers.

The city planned to retain ownership of the 25-foot strip and use MDEQ funds to create a river trail and canoe access points. There was one part of the power plant building that encroached upon the 25-foot zone right up to the river's edge. For this part of the river trail, a causeway type bridge was necessary to go around the building. The city also needed to get voters' approval to sell the portion of the power plant that lay within 25 feet of the river.

The task of acquiring the sole privately owned parcel fell to Chuck Abraham. The parcel's owner was a long time Lansing attorney who had been approached by the city in previous years but refused to sell his property. He had past axes to grind with the city and thus Abraham, being skilled in the gentle art of negotiation, was the perfect person to approach him. After a long and subtle process, the developer secured an option on the property without alerting the owner to the potential project.

Because of the large number of new jobs to be created, LEDC contacted its state level counterpart, the Michigan Economic Development Corporation (MEDC). It was determined that the project would be eligible to apply for Michigan Economic Growth Authority (MEGA) tax credits. These credits are based upon the number and pay levels of new jobs created in Michigan. MEDC also held out a very large carrot to the company in the form of a tax free Renaissance Zone. This designation, if received, would exempt the company from paying property taxes for the first 12 years and then phase them back in to the full rate by year 16.

With the historic nature of the power plant, the city and LEDC were also able to help the developer apply for both state and federal historic tax credits. Because of the extraordinary size and nature of the project, it qualified for an additional enhanced 15 percent historic tax credit from the state. Additionally, because the project qualified as a brownfield redevelopment project under state law, the developer was able to apply to the state of Michigan for a Brownfield Michigan Business Tax Credit for 10 percent of the total eligible investment up to $10 million.

LBRA offered to use tax increment financing (TIF) to reimburse the developer for eligible brownfield redevelopment costs. These costs could include demolition of the portion of the city parking ramp, demolition of the chilled water system, and demolition and relocation of the steam redistribution system. The costs were estimated to be $3.9 million.

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The biggest issue was how to pay for the construction of a new chilled water plant. With the demolition and scrapping of the current system, there was the need for a new chiller plant to serve the existing customers including General Motors, the largest private sector employer in Lansing. The state of Michigan, also a chilled water customer, generously offered a location for the new chilled water plant one-half mile from the old and accessible to the current chilled water loop. This was a major stroke of good fortune, but who was going to pay for the new $20 million chiller? LBWL would still owe on the debt for the existing chiller. The chilled water service revenue only covered its cost of operation and the current debt service. Adding $20 million more in debt would drive the service into the red. Increasing prices would be difficult, because there were only a few large users with long-term contracts in place.

However, there was a solution to the chiller problem. The cost of relocating public utilities is eligible to be reimbursed with Tax Increment Revenue by the Lansing Brownfield Redevelopment Authority (LBRA). LBRA calculated the expected tax capture over the first 30 years of the new development and found that even with the first 12 years being tax free, the remaining 18 years would produce an estimated $1.8 million per year in tax capture. With such a large future revenue steam, it would be possible to propose to the developer that they pay for the new chiller plant and then get reimbursed in the future. Additionally, the Accident Fund committed to purchasing both chilled water and steam from the city, generating additional revenue.

With a solution for the deal killing chiller issue in hand, it was time to present the developer and Accident Fund with the initial incentive package:

• Present Value (6%) Property Taxes Abated	$12,600,000
• Historic Tax Credits	$11,000,000
• Brownfield MBT Credits	$10,000,000
• Present Value of MEGA MBT Credits	$9,000,000
• Investment in Public Riverfront Access (MDEQ)	$3,200,000
• Environmental Assessment and Clean-up (EPA)	$600,000
• Present Value (6%) Demo and Chiller Costs	$12,600,000
• **Total Estimated Value of Incentive Package**	**$59,000,000**

March 9, 2011 – cutting the ribbon at the grand opening.

Accident Fund and BCBS accepted the incentive package and the city, LEDC, and developer prepared for a public announcement. While the developer and Accident Fund worked on the final design, engineering, and financing, LEDC, LBRA, and MEDC worked closely together on the incentives. Concurrent to this effort, several related purchase and development agreements needed to be negotiated and executed. The legal costs alone for all parties would be over $1 million. The Lansing City Council along with many other public body boards held multiple public hearings and meetings, ultimately clearing the way for the announcement of the project.

THE PROJECT BEGINS

With much fanfare, the project was announced on October 8, 2007. As with most big economic development projects, not everything was buttoned down before the announcement was made, and this project was no exception. However, after having come so far and solving so many seemingly insurmountable challenges, the Project Team was not going to be denied. Lansing voters approved the sale of the portion of the plant that extended to within 25 feet of the Grand River, and the LBWL Board approved the sale of the power plant and property. At this point, the entire site could be assembled and sold to the developer, Christman Company.

The smokestack was dismantled in December 2007. Because the stack was located on top of the 10-story building, it had to be cut into sections and lifted down to the ground in big pieces. In early 2008, the interior of the power plant was torn out, with many tons of steel and concrete lifted up and out of the top of the building. At the same time, the previously privately owned property was demolished, and that portion of the site was cleared. This allowed for the environmental remediation to be performed.

By mid-2008, the old windows were being removed and replaced while the new floors were being lowered into place through the now open roof in the power plant. The steel frame of the new adjacent building was being erected and the new river trail infrastructure installed. In the year 2009, the interior of the power plant was being finished and the exterior of the new building completed.

In 2010, the parking ramp was underway while the interior of the new building was completed. The LEDC issued a $32 million taxable bond to finance the parking ramp to keep the project on track. When the calendar turned to the year 2011, the project was definitely the talk of the town. The ramp was nearing completion, and the interiors of both buildings were finished and furnished. The project was completed on time and on budget. On March 9, 2011, almost five years from the date the LEDC released the Request for Proposals, the grand opening of the Accident Fund world headquarters was held. The final project numbers were as follows:

• Rehabilitation of Power Plant	$65,000,000
• Construction of Adjacent Office Building	$40,000,000
• Construction of Parking Ramp	$32,000,000
• Construction of New Chilled Water Plant	$20,000,000
• New Personal Property Purchased	$18,000,000
• Soil Remediation Costs	$370,000
• Dewatering Costs	$40,000
• Costs to Implement Activity Use Limits and Eng. Controls	$25,000
• Costs to Mitigate Lead Paint and Asbestos	$1,000,000
• Demolition	$5,000,000
• Other Costs	$565,000
• **Total Project Cost**	**$182,000,000**

A CROWN JEWEL OF A DEVELOPMENT

The Lansing Ottawa Power Station Project transformed a vacant and contaminated ten-story, former coal burning power plant into the world headquarters of the Accident Fund Insurance Company of America. This brownfield redevelopment project combined the renovation of the historic power plant with the construction of a new contemporary office space, to create results that are both visually stunning and extremely functional.

A long list of physical, environmental, and economic barriers had to be overcome to make the project a reality. Mayor Virg Bernero, the Lansing Economic Development

The Lansing Ottawa Power Station Project transformed a vacant and contaminated ten-story, former coal burning power plant into the world headquarters of the Accident Fund Insurance Company of America. This brownfield redevelopment project combined the renovation of the historic power plant with the construction of a new contemporary office space, to create results that are both visually stunning and extremely functional.

Corporation, Lansing Board of Water and Light, city of Lansing, and its Brownfield Authority worked closely with the developer, Christman Company, to overcome each and every hurdle. The U.S. Environmental Protection Agency, Michigan Economic Development Corporation, Michigan Department of Environmental Quality, and State Historic Preservation Office also provided invaluable assistance to help create a financial incentive package that turned a prominent symbol of stagnation and decline into a major generator of economic activity and civic pride.

All together, the $182 million project tallied over one million worker hours, retained 600 high-paying jobs, and created another 500 positions. The new headquarters has served as a catalyst to generate additional retail, commercial, and residential development projects in the area. The power plant has now come full circle, from once providing power to the city, to being a symbol of decline, to coming back alive to power the new economy. The last few years have proven the coal stained building was truly a diamond in the rough, waiting patiently to become a jewel in the heart of Lansing.

Photo by Justin Maconochie.

The finished interior of the top floor of the former power plant.

2012 CONFERENCE SPONSORS & EXHIBITORS

IEDC would like to thank the sponsors and exhibitors of the **2012 Leadership Summit** for demonstrating their commitment to the important work of economic developers. It is through their generous support that IEDC has brought leaders of the profession together for this forum of professional development, peer networking, and discussions of the most imperative issues facing economic developers today. We proudly recognize the following sponsors as partners in helping economic developers to build strong, more vibrant communities.

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NEWS FROM IEDC

AEDO PROGRAM REACCREDITS FIVE ECONOMIC DEVELOPMENT ORGANIZATIONS

IEDC has reaccredited five new organizations: Cabarrus Economic Development (NC), Muncie-Delaware County Economic Development Alliance (IN), Virginia Beach Department of Economic Development (VA), Berks Economic Partnership (PA), and the Sacramento Area Commerce and Trade Organization (CA). These organizations represent the high quality and dedication to excellence that the AEDO program demands.

Earning accreditation is a great way for economic development entities to increase their visibility in the community and gain independent feedback on their organizational operations. For more information on the AEDO program, contact Tye Libby (tlibby@iedconline.org).

IEDC COMPLETES DALLAS/FORT WORTH (DFW) INTERNATIONAL AIRPORT STUDY RE: INTERNATIONAL BUSINESS DEVELOPMENT

IEDC recently provided technical assistance support to the DFW Airport to explore a more pro-active role for the airport in supporting international business development and attracting global companies to the region. IEDC sent an expert team that included Gene DePrez, Bob Farley, and Adam Wasserman to consider several options for this new international business development function.

Through this project, IEDC learned more about the important role airports play as global gateways, logistics hubs, and economic engines for regional development, as well as the importance of regional collaboration and partnerships for international marketing efforts.

EDRP RESEARCH ON THE SITE SELECTION INDUSTRY

IEDC has completed research that explores the workings of the site selection industry today and provides practical guidance to help economic developers work with consultants to the benefit of their communities. Funded by the Economic Development Research Partners (EDRP) program, the report is based on interviews with 40 economic developers, site selection consultants, and industry observers. It is now available on the EDRP page of IEDC's website.

In addition, EDRP will be sponsoring research focusing on internal practices of economic development organizations and how they can be improved. These will include business practices of EDOs, economic development metrics, and financing EDOs, among others. The research will be released through a series of papers throughout the year.

BEST PRACTICE RESEARCH IN POST-DISASTER ECONOMIC RECOVERY

Through an EDA Disaster Recovery grant, IEDC recently performed best practice research for the New Orleans Business Alliance, a newly established economic development public-private partnership, to assist with its capacity building efforts. The research focused on the effective use of incentives in economic development, appropriate strategic planning models for the city of New Orleans, and city strategies for attracting foreign direct investment (FDI).

IEDC is also performing case research on effective recovery strategies for several disaster-impacted communities. These cases will be consolidated into a publication for distribution in spring 2012 through IEDC's communication network and the RestoreYourEconomy.org disaster recovery website.

ECONOMIC DEVELOPMENT STRATEGIC PLANNING COURSE COMING TO ALBANY, NY

AICP Certification Maintenance points: CM I 16

This May 14-15 in Albany, NY, IEDC presents its Economic Development Strategic Planning course. This highly interactive course lets participants work in small teams to help understand the complexity of strategic planning and its challenges. Economic developers must build consensus among board members, stakeholders, and the community as a whole, creating a unified vision for the future. Learn techniques to build consensus among stakeholders who represent different values and interests.

Participants will learn the quantitative techniques used to better understand their community including: location quotients, shift share, input-output, and cluster analyses. Explore project assessment methods for setting priorities and measuring your plan's impact.

INTERNATIONAL ECONOMIC DEVELOPMENT COUNCIL

CALENDAR OF EVENTS

IEDC sponsors an annual conference and a series of technical conferences each year to bring economic development professionals together to network with their peers and learn about the latest tools and trends from public and private experts.

IEDC also provides training courses and web seminars throughout the year for professional development, a core value of the IEDC. It is essential for enhancing your leadership skills, advancing your career, and, most importantly, plays an invaluable role in furthering your efforts in your community.

For more information about these upcoming conferences, web seminars, and professional development training courses, please visit our website at www.iedconline.org.

CONFERENCES

2012 Federal Forum
March 18-20
Alexandria, VA

2012 Spring Conference
June 10-12
St. Louis, MO

2012 Annual Conference
Sept. 30-Oct. 3
Houston, TX

2013 Leadership Summit
January 27-29
Orlando, FL

2013 Federal Forum
April 14-16
Alexandria, VA

2013 Spring Conference
June 9-11
Ann Arbor, MI

2013 Annual Conference
October 6-9
Philadelphia, PA

TRAINING COURSES

Business Retention and Expansion
April 19-20, 2012
Atlanta, GA

Economic Development Credit Analysis
April 25-27, 2012
Chicago, IL

Managing Economic Development Organizations
May 10-11, 2012
Baltimore, MD

Economic Development Strategic Planning
May 14-15, 2012
Albany, NY

Entrepreneurial and Small Business Development Strategies
June 7-8, 2012
St. Louis, MO

Real Estate Development and Reuse
July 12-13, 2012
Minneapolis, MN

Economic Development Strategic Planning
July 26-27, 2012
Chicago, IL

Economic Development Marketing and Attraction
August 9-10, 2012
Atlanta, GA

Economic Development Credit Analysis
August 22-24, 2012
Baltimore, MD

Technology-led Economic Development
September 13-14, 2012
Albany, NY

Business Retention and Expansion
September 27-28, 2012
Houston, TX

Workforce Development
October 4-5, 2012
Baltimore, MD

Real Estate Development and Reuse
October 18-19, 2012
Atlanta, GA

Economic Development Credit Analysis
November 7-9, 2012
Phoenix, AZ

Business Retention and Expansion
November 15-16, 2012
Tampa, FL

Neighborhood Development Strategies
December 6-7, 2012
Los Angeles, CA

CERTIFIED ECONOMIC DEVELOPER EXAMS

June 9-10, 2012
St. Louis, MO
(Appl. Deadline: April 9, 2012)

September 29-30, 2012
Houston, TX
(Appl. Deadline: July 30, 2012)

RECERTIFICATION FOR CERTIFIED ECONOMIC DEVELOPERS

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INTERNATIONAL ECONOMIC DEVELOPMENT COUNCIL

building an entrepreneurial

ECOSYSTEM IN NORTHWEST FLORIDA

By Charles Wood, CEcD

INTRODUCTION

The Problem – The Pensacola MSA and Northwest Florida have a dependency issue. The region has one of the single largest military footprints on the globe with huge Air Force and Navy installations including Eglin Air Force Base, Hurlburt Field, and Naval Air Station Pensacola. Additionally, the Pensacola MSA and the rest of the region is a well known, seasonal tourism destination. The region's significant dependency on tourism was highlighted by the huge impact of BP's Deepwater Horizon Oil Spill which all but closed the tourism season for most of Northwest Florida and the rest of the Northern Gulf Coast. Finally, the Pensacola metro has a long history of heavy manufacturing that was primarily tied to the paper and chemical industries dating back to the early 20th century. The manufacturing base included Champion Paper (now International Paper) and Monsanto (now Ascend Performance Materials) which between the two employed more than 20,000 in the 1960s. Today those two companies employ less than 1,500 combined.

This lack of diversification was brought into focus during the Base Realignment and Closure program (BRAC) of the early 2000s. However, BRAC presented a unique opportunity to leverage federal funding to develop an economic diversification plan that provided a general framework that would aggressively reorient the region toward a knowledge-based economic development strategy. This article focuses on the implementation of the plan that laid the foundation for long term, innovation and entrepreneurial growth that started in Pensacola, Florida, and is emanating across the Gulf Coast.

The 15,000-square-foot Center for Innovation and Entrepreneurship is located in Pensacola State College's downtown facility. The technology incubator is part of a multi-step strategy for developing critical entrepreneurial assets in Northwest Florida.

The process of developing this plan was the first and perhaps most critical step in moving the region toward a new approach to economic development. As the framework of the plan was created, it brought the community's business and political leadership to the table and served as an acknowledgement that all was not good in the kingdom. This acknowledgement provided for critical new additions in personnel, volunteers, and ideas. Ad-

Charles Wood, CEcD, is president of the economic development consulting firm Imperium Economic Strategies. Prior to founding the firm, he served as the senior vice president for economic development with the Pensacola Bay Area Chamber of Commerce. (cwood@imperiumeconomics.com)

A MULTIDIMENSIONAL STRATEGY FOR BUILDING AN INNOVATION-BASED ECONOMY

This article discusses a multi-step strategy for developing critical entrepreneurial assets in Northwest Florida. The article includes an overview of the development of a marketing and education network, a technology incubator, educational strategies, and other components necessary in building an entrepreneurial ecosystem. The concepts and strategies discussed in this article are long term strategies that require significant commitment by economic development organizations and the communities they serve. All of the strategies discussed herein may be applied to other secondary and tertiary markets in an effort to foster entrepreneurship and grow early stage companies. Other communities should pay particular focus to existing entrepreneurs in the same manner as existing business retention and expansion efforts.

ditionally, it created an opportunity to reach out to entrepreneurs in the community that had not been brought into the region's economic development efforts.

ENTREPRENEURIAL LANDSCAPE

In 2005, the entrepreneurial landscape in the Pensacola MSA was limited to the traditional chamber of commerce networking atmosphere, with some recognition being paid to a loosely defined entrepreneurial interest. These networking events were administered by the Pensacola Bay Area Chamber of Commerce on a monthly basis. Born out of this network, a very small group of passionate entrepreneurs began to focus on convincing the community's business and political leadership that entrepreneurship was a critical economic development strategy. These discussions dovetailed into the federally funded economic development strategic plan being developed as a result of BRAC that provided significant focus on innovation-based economic development, entrepreneurship, and quality of place. The plan was adopted by the Pensacola Bay Area Chamber of Commerce in 2006. In addition to the plan being adopted, new leadership was brought in to lead this approach to economic development.

The plan was funded through the Department of Defense Office of Economic Adjustment. Florida's Office of Tourism, Trade and Economic Development and the Pensacola Bay Area Chamber of Commerce leveraged this funding to hire TIP Strategies to develop the diversification plan for Escambia County. Other key supporters of the plan included Escambia County, the city of Pensacola, and various entrepreneurs from the region.

ENTREPRENEURIAL STRATEGIES

The Network – The first strategy was put into place in mid 2007. It served as a regional network focusing on building connections in the five-county Mobile, AL, Pensacola and Fort Walton Beach, FL, metropolitan statistical areas as well as creating a marketing platform that would help tell the region's entrepreneurial story both inside and outside of the region. The network was branded as iTEN Wired (with iTEN standing for innovation, technology, and entrepreneurs), a completely separate brand from the Pensacola Bay Area Chamber of Commerce.

The iTEN Wired website creates a virtual network to market to and connect entrepreneurs and entrepreneurial resources across the Gulf Coast.

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While the chamber serves as the lead entity and is the sole financial backer for this initiative including providing staff, materials, and a marketing budget, the primary economic development organizations in the adjoining four counties agreed to partner in the initiative. They do this by providing information on entrepreneurial support systems, entrepreneurial companies and their leaders as well as their communication network to help brand and show support for the iTEN Wired initiative.

Critical components of the iTEN Wired initiative included summits, regular communication through newsletters, and a website. The summits, which are held three times per year, serve as a critical means of bringing together entrepreneurs, researchers, business and political leaders to discuss critical issues affecting entrepreneurship both at the regional and global levels. National speakers are brought in to help provide an outside perspective, and critical networking takes place to allow relationships to be built. Additionally, angel and venture capitalists have served as speakers, outlining the specific issues that they focus on when considering an investment in an early stage company as well as providing their perspective on the entrepreneurial environment at both the regional and national levels.

The website serves as a story board, showcasing individual entrepreneurs and how they built their companies as well as telling the stories of the region's successful tech-based entrepreneurial companies. For example, the website highlights serial entrepreneur Dr. Paul Hsu, a first generation immigrant from Taiwan, who has grown companies in the aerospace, avionics, and medical device sectors in Northwest Florida.

Additionally, the website provides an asset map for other entrepreneurs to identify resources that can help them start and grow their companies. The stories serve as a way to a) educate the local communities about the impact that entrepreneurs can have on a community, b) showcase to the world that innovative ideas and technologies are being developed in the region, and c) encourage entrepreneurs to consider the region as a viable location for their technology-based businesses.

Start-up Engine – While the discussion of creating a business incubator had been going on for more than five years, a champion for the effort was never established nor

The downtown tech campus's concept plan highlights the urban park in the center of the nine-acre project, aimed at second and third stage companies.

was there a willingness to provide the necessary resources to establish a fully functioning, technology-focused business incubator. In 2008, the Pensacola Bay Area Chamber stepped up as a champion for this effort.

The chamber formed a partnership with Pensacola State College to create the Gulf Coast Center for Innovation and Entrepreneurship (CIE). With the chamber as the lead, the college provided approximately 15,000 square feet of office space in its downtown Pensacola facility as well as insurance and maintenance of major systems at substantially discounted rates. The chamber provides a staff person to manage the CIE as well as $80,000 in annual funding to support critical infrastructure such as technology, education, marketing, and services to tenants (referred to as clients).

To date, approximately 7,000 of the 15,000 square feet have been utilized and the CIE now has several clients and virtual clients that are involved in software development, application development, and engineering. One such company is The Analyst Group, a technology company started by a local entrepreneur that has grown to ten employees. The company provides software and technology support for the call center industry and is now signing on major international customers. Additionally, the CIE has even been used as a business recruitment location for a small technology company that relocated from another state.

Although the CIE is a program of the Pensacola Bay Area Chamber of Commerce, the CIE has an advisory board composed of economic development partners including Pensacola State College, the Small Business Development Center, and entrepreneurs that provide guidance and oversight to the chamber's economic development staff and the early stage companies that have located in the incubator.

Education Delivery – Entrepreneurial education takes place both inside the chamber's economic development strategy as well as with key community stakeholders. The University of West Florida instituted an entrepreneur in residence program and started a graduate level entrepreneur course in the College of Business. Meanwhile, the chamber created the Excellence in Entrepreneurship course to provide a boot-camp approach to fledgling entrepreneurs. The course provides a basic understanding of marketing concepts, financing, business strategy and structure, accounting, and other critical components for starting and running a company.

The courses are taught by subject matter experts from the local business community as well as key resource partners such as the University of West Florida and the Small Business Development Center. The goal at the end of the course is for companies to have a refined business plan and be eligible to enter the CIE if they wish.

In addition to the more structured program of the Excellence in Entrepreneurship course, CEO roundtables are offered. These roundtables provide the CEO of an early stage company with the ability to sit around the table with three to five entrepreneurs that founded and created larger, successful companies. The CEO shares his or her current challenges and receives feedback from the more experienced entrepreneurs on business strategies they employed in order to overcome similar issues.

Finally, the iTEN Wired summits are utilized as a means to educate the community's business and political leadership on the importance of entrepreneurship. Tactics and methods that could be employed in the community to enhance and improve its entrepreneurial environment are shared and discussed in open forums with elected leaders, entrepreneurs, business executives, and academicians. Summits have drawn as many as 100 attendees from Northwest Florida, Alabama, and Mississippi.

Location for Mature Innovators – While the CIE serves as a place for early-stage, innovation-based companies, the community needed to create a mechanism to embrace second and third stage companies with significant potential for employment growth. Additionally, the community needed to overcome its exclusionist history in terms of owning property in downtown Pensacola. If these challenges can be overcome, the downtown has the capacity to be a center of creative and innovative industry and a first choice location for high tech firms looking to substantially grow their employment base.

To accomplish these goals, the Pensacola Bay Area Chamber laid out the idea of creating an urban scale technology park on the fringe of downtown Pensacola on land owned by the city of Pensacola and Escambia County. Chamber staff negotiated a proposal to transfer 9.2 acres owned by the city and county to an industrial development authority managed by the chamber.

The chamber then applied for and was awarded a $2 million infrastructure grant from the U.S. Economic Development Administration that was compounded by a line of credit from Escambia County for the purpose of developing the infrastructure on the site. Additionally, the city of Pensacola agreed to fund the development of a park-like retention pond on nearby property to allow for improved development density on the technology park property as well as several public and privately owned parcels in close proximity to the technology campus.

Pensacola's downtown technology campus is currently under construction and has the capacity to accommodate approximately 500,000 square feet of urban scale office space. The location is within walking distance to much of downtown Pensacola's business and entertainment services as well as the headquarters of Gulf Power Corporation and a nationally acclaimed think tank, the Institute for Human and Machine Cognition (IHMC).

To some extent, IHMC, which is a research institute focused on robotics, human performance, and artificial intelligence, serves as an anchor for the technology campus, creating a vision for the types of companies and research and development entities that could populate the campus over the next decade. Companies targeted for the park will most likely range from second stage software and support companies to larger companies focused on the defense and aerospace sectors.

The poster for the Center for Innovation and Entrepreneurship showcases the center's support services.

Strategies in their infancy – The next two strategies are in their infancy, with major efforts only beginning to solidify. The ability of the local economic development organization to leverage state and regional support for these efforts is critical both in terms of financial resources as well as outside expertise.

Economic Gardening – In addition to the previous strategies, an economic gardening strategy is being undertaken at the state level, with the Pensacola Bay Area Chamber serving as leader at the MSA level. This effort is based on the success experienced in Littleton, Colorado, through an increased focus on providing technical assistance to second stage companies (companies with 10-99 employees and $1 million to $50 million in annual revenue).

Key components to this effort include leveraging trained consultants for specific technical assistance of individual companies to assist them in overcoming challenges that lead directly to revenue and employment growth. The technical assistance often provides specific consultation on how to increase a company's customer base. Additionally, CEO roundtables are held monthly in an effort to create peer support networks for second stage CEOs. Finally, larger quarterly meetings and networking sessions are held in an effort to build broader support and knowledge of the impact of second stage companies on the local and statewide economies.

Access to Capital – The ability for early and second stage companies to access angel and venture capital in the Gulf Coast region has been very limited. In the 2005-2006 timeframe a limited effort was initiated, which resulted in a few "venture forums" which were open to the public.

During the 2007-2008 timeframe, the Pensacola Bay Area Chamber of Commerce began to identify angel investors in the region and incorporated closed session forums in conjunction with the iTEN Wired Summits.

For a community or region to be successful in terms of entrepreneurial development, it is critical to integrate entrepreneurship into traditional, core economic development strategies such as business recruitment and retention as well as product development.

These early efforts are beginning to show results. However, the results have not yet been in the form of substantive capital flow but rather through the connectivity that has been developed among angel investors. Those investors recently formed the Central Gulf Coast Investment Network as a formal means of structuring a group of like minded and capable investors with the goal of developing deal flow (identifying and funding companies with viable business models).

LESSONS LEARNED

Integration – For a community or region to be successful in terms of entrepreneurial development, it is critical to integrate entrepreneurship into traditional, core economic development strategies such as business recruitment and retention as well as product development.

CEOs of successful entrepreneurial companies have a unique ability to make a very compelling case to businesses that economic development organizations are trying to recruit. They show the capacity of the community to accommodate their industry in terms of talent, logistics, and capital – all of which must be proven to recruitment targets. From a retention perspective, your successful home grown companies will be the very companies that other communities are seeking. The better the relationship between the entrepreneur and their company and the community, the easier it will be for the community to retain the company and the entrepreneur.

The product development strategies of the community should be developed with an eye toward entrepreneurs and their companies. Whether this is through the development of commerce parks and speculative buildings or high speed telecom infrastructure, entrepreneurial companies should be a significant consideration in the community's investment in critical infrastructure.

Showcase Successes – It is quite likely that many people in any community, including economic development stakeholders, will not be aware of the community's past successes in terms of entrepreneurship. The companies that should be showcased sell their services and products outside of the community and region and therefore do not have local marketing and have limited to no local customer base. By showcasing these successes, the community can understand that not only is it possible to grow innovation-based companies in the region, but they already have tangible examples to point to.

Inclusion – Where possible, bring CEOs and founders of entrepreneurial companies onto boards and advisory councils. Not only does this inclusion show a dedicated focus to entrepreneurial and innovation-based companies, but it also assists in retaining those businesses as well as creates strong partners in terms of business recruitment. Keep in mind that entrepreneurs are likely to be assertive and highly focused on results and tangible outcomes. They may become frustrated with the politics that often surround economic development. However, they can provide an economic development organization with an insider's perspective of the types of companies that communities are trying to recruit, retain, and grow.

Resources – None of Northwest Florida's successes would have been possible without the commitment of financial and staff resources by the Pensacola Bay Area Chamber and its private and public sector partners. A substantial commitment was made that allowed dedicated staff to focus exclusively on entrepreneurial strategies at both the local and regional level. Furthermore, staff had access to resources that allowed for the implementation of those strategies.

OUTCOMES

Awareness – The chamber's aggressive focus on innovation-based entrepreneurship created an increased awareness both inside and outside of the region. Unknown entrepreneurs became celebrated and the community began to realize the impact of successful entrepreneurs and their companies in terms of employment and payroll as well as their capacity for innovation and the national and sometimes international reach that they had attained. Additionally, the focus on entrepreneurship is beginning to percolate out beyond the five-county region and has gained placement in local and regional media venues in Alabama, Florida, Mississippi, and North Carolina.

The conceptual elevations show low-rise and mid-rise facilities of the downtown tech campus blending into the adjacent neighborhood.

Partnerships – Each of the entrepreneurial strategies outlined here required significant partnership development. The partnerships created through programs like iTEN Wired and the technology campus have created a renewed willingness to work together to benefit the regional and local economies of the Gulf Coast. Economic development organizations that are often seen as competing entities have joined forces, local governments have partnered on infrastructure projects, and education entities have stepped up to provide resources to support entrepreneurship and job creation.

Product and Resources – Local governments pledged real estate as well as capital funds for infrastructure improvements. The local college provided office space in downtown and the private sector stepped up to provide significant services and capital to leverage the public sector's investment.

Job Creation and Investment – While this outcome is effectively a blend of entrepreneurship and business retention and expansion, it is anticipated that the entrepreneurial companies the Pensacola Chamber has worked with in the Pensacola Bay area will create more than 150 new jobs over the next 12 months. Two of those companies alone have capital investment plans of more than $4 million each. Additionally, over the last five years, Pensacola has seen approximately a dozen small, innovation-based firms locate or expand in its downtown area, including companies that have located in the CIE and from other states. Those companies have specifically indicated that the growing focus on small, innovation-based companies is one of the reasons they chose the location.

Each of the entrepreneurial strategies outlined here required significant partnership development. The partnerships created through programs like iTEN Wired and the technology campus have created a renewed willingness to work together to benefit the regional and local economies of the Gulf Coast.

CONCLUSION

Pensacola and Northwest Florida are better known for their sugar white beaches and as a training ground for the men and women of the armed services. However, with the level of resources that have been committed and the success stories that are starting to emanate from the region, the tide is beginning to turn. Building an entrepreneurial ecosystem is not an overnight process. It will take decades of continued support to water the seeds that have been planted. The effort should continue as a full-court press with emphasis placed on a number of initiatives at any one time. But the initial steps have been taken to move toward a knowledge-based economy with significant focus on the power that entrepreneurs bring to a region.

sustainable lisle

BUSINESS PARTNERSHIP

By Catherine Schuster

How does a municipality with limited resources facilitate sustainability within the community in a cost effective, timely manner? Can a sustainable focus positively impact the economic vitality of the area? What is the role of economic development in this process? These are some of the questions answered in the following article which reviews the village of Lisle's Sustainable Business Partnership, Green By Choice.

Green By Choice is a program for Lisle businesses that helps them meet the needs of consumers, while reducing waste and conserving natural resources. Participating businesses receive a green audit, agree to offer sustainable products/services, and incorporate sustainable practices into their operations. Members display signage that thanks consumers for their support and promotes a Green Directory of Lisle Businesses, which is located on the village's website. The directory reviews members' green products/services, sustainable operations, and highlights special green initiatives.

The village of Lisle is located 26 miles west of Chicago in DuPage County. Home to the world-renowned Morton Arboretum, it is known as "The Arboretum Village." From its vibrant corporate corridor to its beautifully redeveloped nature-themed downtown, Lisle has evolved into a community of 22,400 people and more than 1,000 businesses, including the international headquarters of Navistar and Molex. In 2007, *Money Magazine* named Lisle as one of the top 20 "Best Places to Live in America," citing economic opportunity and the high quality of life available in the village.

Spring at the Morton Arboretum

A NATURE BASED HERITAGE

In 2006, the economic development director partnered with the firm Tandem Design Strategic Marketing to refresh Lisle's brand and communications, which were originally inspired by the Morton Arboretum's 1,700 acres of woodlands, wetlands, prairies, lakes, meadows, and tree conservation activities. The following brand promise was created and approved by the Village Board in 2007:

Home to the Morton Arboretum,
Lisle's Unique Sense of Place

Is Infused with Nature whose Powerful Presence

Energizes People, Sparks Innovation and Inspires Creativity.

It is a Community that Intelligently Blends Innovation with a Respect for Nature

To Offer Outstanding Work, Life and Visitor Experiences.

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GREEN BY CHOICE

While many municipalities support the concept of sustainability, making progress can be time consuming and challenging. The need for significant funding and the efforts to alter deeply embedded societal behaviors can be overwhelming and discourage action. This article presents a Midwestern municipality's efforts to introduce and expand sustainability throughout its business community. Winner of the 2011 IEDC Green or Sustainable Project of the Year, in its population category, the village of Lisle's Green By Choice program illustrates how sustainability can serve as an economic strategy in addition to reducing waste and preserving precious resources for future generations. This program is especially suitable for communities with populations of 50,000 or less with limited resources.

Lisle's appreciation for nature and the environment was inspired by the Morton Arboretum and is reflected throughout the community. The village's largest residential development, the 744-acre Green Trails Subdivision, contains 25 miles of trails, nine lakes, 17 public parks, mature woods, grassy open spaces, and hills and flatland. Hundreds of residents volunteer at the Morton Arboretum and participate in recycling programs that were initiated decades ago, before it became common practice.

During the past few years, the village and other community organizations began implementing a significant number of eco-friendly initiatives. In 2008, Lisle co-hosted the Sustainable Cities Symposium presented by Illinois Lt. Governor Pat Quinn and the Illinois Green Governments Coordinating Council. Lisle also received a Clean Air Counts Award for the village's commitment to clean air initiatives and reducing ozone in the Chicago region.

In 2011, the village earned the Earth Flag Certification from the respected environmental education organization, SCARCE (School and Community Assistance for Recycling and Composting Education), and incorporated an array of eco-friendly practices into village operations. The concept of sustainability was expanding from the residential to the municipal and organizational sectors of the community.

DuPage County Board Member Jeff Redick, Lisle Village Trustee Ed Young, and Mayor Joe Broda at the Earth Flag presentation.

THE ORIGIN OF GREEN BY CHOICE

A number of evolving circumstances led to the creation of the Green By Choice program. Residents, local organizations, and the village were increasingly becoming more sustainable. However, it was difficult to ascertain what sustainable initiatives were occurring within the local business community. Retail trends started to reflect the consumer's increasing interest in identifying and supporting sustainable businesses. The recession was in full swing and local businesses were seeking ways to differentiate, increase sales, strengthen customer loyalty, and reduce operating costs. Many businesses were curious about the concept of sustainability. SCARCE began offering green audits to encourage businesses to become more sustainable. The village hired a new management analyst in part to implement and manage general sustainability initiatives.

Above: Green By Choice decal that members display in storefronts.

Left: Green Directory located on village's website.

Village staff recognized that encouraging the Lisle business community to become more sustainable would benefit the environment. Tandem Design Strategic Marketing believed it would also help reinforce the village's brand, provide a competitive advantage to the community, and provide a consistent message to the public. The economic development director, management analyst, and Tandem Design Strategic Marketing worked together to create the components and strategy for the Green By Choice program.

WHAT'S IN A NAME?

Initially, the Green By Choice program was called the Sustainable Lisle Business Partnership. Technically, "sustainable" was the correct term to use. However, the Downtown Business Council felt that many consumers might not fully understand "sustainability" as it was just being introduced to mainstream America and was not very engaging. It believed the public would respond better to the more familiar term, "green." At the same time, the Village Board wanted to ensure that the program was offered on a voluntary basis – that individual businesses could choose to participate. Businesses also liked the fact that they made a conscious choice to become a member. Hence the name Green By Choice evolved and seemed like a natural fit. However, to help educate the public, Sustainable Lisle Business Partnership remained part of a logo that was specifically designed for the program.

GREEN BY CHOICE PROGRAM

The program was first introduced to local businesses during an educational seminar, coordinated by the economic development director. The seminar reviewed current retail trends including the consumer's rising interest in sustainability. It also introduced the proposed Green By Choice program.

Benedictine University intern Matt Brown conducts a green audit with Aquascape's Gina Mangra.

Lisle Business Recycling Event.

The economic development director then met individually with more than 50 businesses to discuss the program in greater detail. Interest was strong and the majority of businesses agreed to participate in the first step, the green audit.

SCARCE agreed to perform 50 green audits and educate businesses about how to become more sustainable. The audit reviewed water and energy usage, air quality, recycling efforts, waste production, operations, purchasing practices, products, services, and more. It recognized current sustainable initiatives and provided a list of practical eco-friendly recommendations which businesses could choose to adopt. The majority of the first 50 green audits were completed within approximately two months.

Business owners were very interested in becoming more sustainable and appreciated the personalized recommendations offered by SCARCE, which were specific to their respective industries. Owners reviewed the results of their green audits and agreed to offer at least two sustainable products or services and incorporate at least two sustainable initiatives into their operations. In an attempt to encourage initial widespread participation in the program, membership requirements were very reasonable. However, members exceeded these basic requirements and many conducted special green activities that had a global impact.

Members received decals that were displayed in store fronts and colorful table tent cards for store interiors. These items thanked the public for supporting the green business and encouraged people to review the entire Green Directory of Lisle Businesses on the village's homepage at www.villageoflisle.org. The directory listed each participating business, the date of the green audit, green products/services offered, sustainable operations and highlighted special green initiatives. Members were also given permission to place the Green By Choice logo on marketing materials such as ads, business cards, and websites.

Initially, the program was marketed using a number of cost effective channels including newspaper articles, ads, web promotions, and village communications. Later, joint marketing programs helped promote the program using a new website that had been created, www.refreshinglygreen.com, and via radio, TV, and print ads.

Complementary activities, such as Lisle's first Business Electronics Recycling Event, augmented the program.

RESULTS

The primary goal of the program was to encourage the Lisle business sector to become more sustainable, reduce waste, and preserve natural resources for future generations. The program also served as an economic strategy to give businesses a competitive edge in the marketplace, helping them respond to consumer demand for increasingly green products, services, and responsible business operations. The program positively reflected Lisle's distinctive nature/green brand as "The Arboretum Village," reinforced the village's identity, and presented a unified, consistent message to the public.

It became clear that any business could become more sustainable in the context of its unique product and service offerings. Initially, businesses were concerned that becoming more sustainable would be expensive. However, they soon realized that going green could result in

Owners reviewed the results of their green audits and agreed to offer at least two sustainable products or services and incorporate at least two sustainable initiatives into their operations. In an attempt to encourage initial widespread participation in the program, membership requirements were very reasonable. However, members exceeded these basic requirements and many conducted special green activities that had a global impact.

Heart of downtown Lisle located at the entrance to the Garden Walk, a landscaped walking path that winds through downtown.

cost savings or be cost neutral. Business owners adopted a new mindset, looking at their operations with a new perspective and realizing how their actions contributed to society – in terms of current and future impact.

When SCARCE could no longer perform the green audits due to other commitments, the village's economic development and human resource directors approached a local educational institution, Benedictine University, to propose the creation of a Sustainable Internship program. The university was excited about the program and promoted the opportunity to students. Both directors interviewed candidates and selected Matthew Brown, who had an interest in sustainability, as the intern. After receiving training, he was responsible for expanding the Green By Choice program. He presented the program to interested businesses; conducted green audits, reviewed results with businesses; prepared listing sheets for the Green Directory; delivered marketing materials; and organized the first Electronics Recycling Event for local businesses. When the internship ended, village staff continued to manage and expand the program. To date, Green By Choice has 79 members and continues to grow.

AN INCLUSIVE PROGRAM

Initially the program was created for businesses. However, major organizations also agreed to join the program. They included the Lisle Area Chamber of Commerce, the Lisle Convention and Tourism Bureau, the Morton Arboretum, and the Lisle Park District. Green By Choice reflected and supported the ongoing sustainable initiatives of these entities. For example, local hotels utilized sustainable practices in their operations and offered "green" vacation and event experiences. The Convention and Tourism Bureau marketed the village as a "green" destination. The Morton Arboretum had been a leader in tree conservation for decades. The Park District's mission focused on connecting people with a healthy environment. Support from these major organizations was very much appreciated, helped validate the program, and reflected strong community partnerships.

DIVERSE WORLD OF GREEN PRODUCTS/ SERVICES

Consumers from Lisle and the surrounding area patronize Green By Choice businesses and learn about sustainable products, services, and operations. Local businesses present a diverse array of sustainable offerings including:

- Fountains using harvested rain water, rain barrels, solar powered bird baths;
- Organic food, beverages, catering options;
- Alternative energy investments;
- Sustainably produced cabinets;
- Green premiums/awards;
- Electric vehicles;
- Eye glasses made from recycled frames;
- Soy based printing inks;
- Organic pet, clothing and hair care products;
- Green dental practices;
- Green lodging and event experiences;
- Energy efficient lighting;
- Bags made from recycled juice boxes;
- Locally produced artisan crafted wood furniture;
- Decorative sculptures made from recycled materials;
- Green pre-school activities;
- Programmable thermostats, energy efficient equipment, bamboo flooring, eco-friendly insulation, low flow faucets;
- Repair services that extend the life of shoes, luggage, knives, boots, and more; and
- Heirloom preservation services.

The prairie style downtown.

Green By Choice members – Lisle Dental Center, an eco-friendly dental practice and Wild Birds Unlimited.

While the program originally focused on retail businesses, offices have also become members. Businesses began purchasing from other members. For example, a Green By Choice office building used a Green By Choice florist to provide air cleaning plants for a three-story office building. Green By Choice members purchased green cleaning supplies from other members.

ECO-GIVING

Program members participate in a number of sustainable charitable activities, some with a global reach. These include: donations to the Pathways to Nature Conservation Fund; providing clean drinking water to distressed countries; eye glasses donated to church mission groups; bikes donated to Working Bikes, which supplies bikes to rural countries for transportation purposes; collections of gym shoes, tires, batteries, anti-freeze, oil, light bulbs, quilting supplies, hangers, plastic bags, cans, eye glasses, and shoes; donations of wedding dresses and tuxedos to local organizations; sponsorship of highway clean ups; and green travel and meeting tips.

GREEN CREATIVITY AND NEW GREEN BUSINESSES

Some businesses have identified creative ways to reuse products including: transforming empty wine bottles into glass flower pots and lamps, wine corks into name holders, and quilting scraps into fabrics that are used in distressed countries. These businesses also provide free sturdy wine boxes to people who are moving and give used picture frames and mats to crafters for reuse.

New sustainably focused businesses are coming to the village, bringing jobs and depending on the type of business, sales tax revenue. Examples include: Air Cycle, which recycles fluorescent lighting for large commercial customers; Aquascape, which offers beautiful fountains using harvested rain water; Tailored Space Cabinetry, which provides eco-friendly cabinetry and remodeling services; Lisle Dental Center, an eco-friendly dental practice; and Leeco Steel, which produces materials for wind energy products. Each new sustainable business reinforces and strengthens Lisle's green brand.

MUNICIPALITIES AND BRANDING

Municipalities are beginning to understand that, like businesses, they need to differentiate themselves to attract residents, businesses, investors, and visitors. One of the best ways to accomplish this is through the development of an authentic brand. The Green By Choice program was a logical, meaningful extension of Lisle's brand as "The Arboretum Village." The program has served as a unifying theme, reinforcing the village's green/nature based brand and providing a consistent, relevant message to the public.

COST EFFECTIVE

Green By Choice was a cost efficient program to implement. Businesses received complimentary green audits – first from SCARCE, then from the Benedictine University intern, and village staff. Local newspapers and magazines published articles about Lisle and the Green By Choice program and featured a different participating business on a weekly basis. Members also placed ads in special green advertising sections of the local paper to help promote the program to the community.

The majority of the Green Directory was produced in-house and placed on the village's website, eliminating printing costs. A Green By Choice Twitter account – Go Green in Lisle – was created and used to promote the program. Ads and promotions directed people to the website to review the Green Directory. The initial launch and promotion of the program totaled approximately $7,900; professionally produced decals, tent cards, and support materials cost $2,900; and another $5,000 was allocated for an initial marketing campaign, which included print advertising and encouraged people to view the Green Directory on the village's website. Funding came from the economic development director's marketing budget.

Subsequent marketing efforts included joint marketing programs with other local organizations, references

in a nine-minute video (2011 IEDC General Purpose Promotion Award Winner, "The Arboretum Village" Video), a 30-second Comcast cable television commercial, and the 2011 Community Profile, a brochure that presents an overview of the community used in attraction efforts. Most recently, a new Facebook page was launched which uses a theme that reflects the village's sustainable focus, ENJOY! GREEN! LISLE!

Independent recognition of the program is growing. For example, the economic development director was a presenter at the Delta Institute's Green Town Conference in Chicago. In addition, Green By Choice received the IEDC's 2011 Sustainable/Green Development Project Award, within its population category.

LESSONS LEARNED

Implementing the Green By Choice program yielded the following lessons, which may prove useful to those seeking to implement sustainable programs in local communities:

1. A municipality needs to take the lead in initiating sustainability within a community for maximum impact and should lead by example.
2. Engaging in activities that are good for the planet can also be an effective economic strategy, helping existing businesses thrive, attracting new jobs, and increasing sales tax revenue.
3. A sustainable focus takes time to develop and must continually be nurtured until it becomes second nature.
4. Green products/services must be comparable or of a higher quality than traditional products to obtain and maintain consumer support. They also must be priced reasonably so they are affordable for the average consumer.
5. Program costs can be minimized by using local resources and partnering with diverse stakeholders. For example, local resources included SCARCE, Benedictine University, and a local business owner who hosted the Business Electronics Recycling Event in his large parking lot.
6. Remaining flexible and adapting to change can net positive results. For example, when SCARCE could no longer perform green audits, Benedictine University was approached and an Internship Program was developed. The intern engaged was specializing in the sustainable field, did a great job, and received a valuable learning experience. The Internship Program helped strengthen the relationship between the village and Benedictine University, as both parties appreciated each other's assistance.
7. A successful sustainable program can have a global impact. Many members conduct sustainable charitable initiatives that benefit a global audience.
8. "Green" transcends age and affects behavior changes in generations of people. A high school ecology club partnered with a grocery store that became a Green By Choice member, while a Green By Choice preschool conducts green educational activities for its children. Any business or organization can become more sustainable within its context.
9. Finally, while sustainability is a universal concept, in this case it authentically reflects the village's heritage and brand. The program logically builds upon the community's prior sustainability efforts. While residents and organizations initially led the way, Lisle's business community has recognized the important role it plays in preserving the environment for future generations.

Nature-themed downtown.

PROGRAM IMPROVEMENTS

Several ways to improve the program have been identified. Attractive one-sided clings were used as decals which businesses displayed on windows and doors. However, decals can be easily peeled off and can only be read from one side. Using more permanent double-sided stickers, not clings, would resolve the problems experienced.

Visually appealing table tent cards were given to all businesses so they could be displayed throughout stores to help inform consumers and spark conversation. Restaurants were given enough table tent cards for each table. These items were often moved around, damaged or inadvertently placed in hard to see locations. Some were blown over by the wind as consumers entered the businesses. Consequently, village staff needs to periodically revisit businesses to remind them to keep the support materials front and center and to replenish supplies. Going forward, more permanent, sturdy support materials need to be used.

To ensure the program's effectiveness, employees must be educated about Green By Choice and "buy-in." Turnover is a reality in the retail environment. Business owners need to constantly reinforce the program as it is most effective when the decals and tent cards prompt a discussion about the store's participation in the program.

Employees can also proactively approach customers to talk about the program and the store's green products/services, but this can be challenging for some employees.

Reduced municipal budgets and staffing makes routine visits to all program members challenging. Interns can provide valuable assistance and broadcast emails can also help members stay connected and involved. However, actual site visits are most effective. If members of the Village Board participate in these visits, they become even more valuable.

ROLE OF ECONOMIC DEVELOPMENT

Green By Choice related activities such as establishing and maintaining a consistent, authentic village brand; creating programs to support the brand; facilitating the vitality of the business community; and improving the quality of life for present and future generations are economic development related activities. Economic development staff can play many roles in initiating a sustainability program including:

- Helping to establish a community's brand and communications strategy,
- Developing programs that reflect and strengthen the community's brand,
- Implementing programs that help increase the vitality of the business community,
- Creating marketing materials,
- Organizing and participating in educational presentations,
- Promoting programs to local businesses and obtaining buy-in,
- Identifying and working with diverse community partners to assist with program execution and to minimize costs,
- Interacting with the media, and
- Troubleshooting problems.

AN EVOLVING PROCESS

The sustainability movement will continue to evolve. New terminology may replace the current terms – "green," "eco-friendly," and "sustainable." Innovation and new technologies will offer unimaginable solutions to serious ecological problems that threaten the world today. Sustainable initiatives will become accepted standard operating procedures. However, change takes time and perseverance.

Many sustainable initiatives involve regional or national policy changes and require significant financial investments. The Green By Choice program is educational in nature, can be implemented relatively quickly and in a cost effective manner – making it an appealing program for any sized community, but particularly for those with populations under 50,000 with limited resources.

The village of Lisle's Green By Choice program makes the journey to sustainability seem clearer and more achievable. It helps turn the page on non-productive, wasteful practices and ushers in new ways of operating that reduce waste and conserve resources for future generations.

auto

By Dr. Jay Baron and Debbie Maranger Menk

INTRODUCTION

The headlines read "GM to spend $2 billion in hiring" (The New York Times), "Toyota to hire workers" (Inside Indiana Business), "Chrysler plans to hire"(The Associated Press)…. Yet, after the long and debilitating recession in 2008, 2009, and 2010, many auto communities and those communities that formerly hosted automotive facilities are tempted to build their futures on the next great thing: 'Green' jobs, knowledge-based jobs, and high tech industries are often cited as the great hope for local economies. However, it would be a mistake for these communities to entirely move away from the auto industry as it is one of the most significant industries in the Midwest and in the United States, because it involves assembly plants, supplier facilities, and dealerships in every state

This article outlines the significance of the auto industry by discussing the industry in a variety of contexts. Initially, the article describes the long-standing economic influence of the auto industry within the Great Lakes regional economy. The second section describes the period of transition that the industry has undergone in recent decades. Following, the article emphasizes the potential for technology to improve automotive performance and to create demand for further investment and high-skilled jobs. The final section explains the opportunity of international investment in regards to the auto industry. In addition, this article discusses the role that the Center for Automotive Research plays in conducting research and holding forums, which are of significance to the automotive community.

FIGURE 1

The Oldsmobile was the first mass produced gasoline engine vehicle. Its early production in Michigan helped push machine shop bicycle tinkerers into being automotive suppliers and then auto producers themselves. Ransom Olds purchased engines, transmissions, and parts from the Dodge Brothers, Henry Leland, and Benjamin Briscoe, who went on to create Dodge, Cadillac, Lincoln, and Maxwell-Briscoe (later acquired by Chrysler).

TRADITION

The heart of the auto industry is in the American Midwest. At the beginning of the 1900s, when the automotive industry was just beginning to form in the United States, the Great Lakes region's main commerce came from industries which were producing gasoline engines, bicycles, and carriages. These industries built a trained workforce and supply chain that the first automakers tapped to begin producing motor vehicles. The Midwest was home to many inventors working out of their garages and early automotive entrepreneurs with capital to invest. (See figure 1.)

Once the earliest automobile companies began production, regional supplier companies began to specialize in automotive parts, which drew other automakers to the Midwest. This in turn stimulated further creation, expansion, and emigration of suppliers. It is this process of agglomeration that was largely responsible for creating such a concentrated industry in the Great Lakes region.

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ONE OF THE MOST SIGNIFICANT INDUSTRIES IN NORTH AMERICA

The auto industry is of both historical and contemporary significance. The industry extensively employs workers from many fields such as manufacturing, engineering, legal services, and advertising. As the automotive industry has evolved, the industry has demonstrated a growing interconnectedness between technological and automotive innovation. In particular, improving vehicle communication systems and designing cars with lightweight materials will enhance automotive performance, fuel economy, and passenger safety. These technological advances require thorough R&D, generating a robust source of investment and demand for highly-educated technical employees. In general, this article seeks to increase public awareness regarding the immense potential for the auto industry to drive future economic growth.

By 1904, all major U.S. auto facilities and producers were located in the state of Michigan, which produced more than 40 percent of all cars in the U.S. Through subsequent years of investment, the Great Lakes region leveraged a few initial advantages to build an entire industry. Based on this successful history, the Midwest offers manufacturing companies many competitive benefits such as proximity to suppliers, a pool of skilled labor and management, and world-class road, rail, air, and shipping infrastructure. While the historical context is important in understanding the development of the auto industry, recent changes within the auto industry are creating significant implications for the industry's economic profitability and demand for employment.

TRANSITION

The auto industry of today offers communities and their residents opportunities for long-term prosperity. If there is any doubt about this notion, consider the response of communities and states to even just a rumor that an automaker or major supplier is searching for a site for a new plant. And when plant sites are chosen, often the economic incentives provided to the new employer set new records in the realm of economic development and private sector investment.

The industry is currently well positioned to be profitable at much lower levels of production. In the 1990s and early 2000s, auto industry production capacity stood at record levels, and even with the high levels of vehicle sales in those years, the industry was seriously overbuilt. During the recent recession, automakers and suppliers rationalized capacity, bringing both capacity and production levels more in line with market demand. And as the economy has begun its slow recovery, industry employment has grown as well – with around 20,000 jobs in motor vehicle and parts manufacturing being created between December 2009 and May 2011, although employment levels remain below the high levels seen before the recession.

The U.S. market is one of the largest and most profitable motor vehicle markets in the world. The three U.S.-based companies have refocused product design and improved quality and productivity. Ford has achieved profitability, and the bankruptcies at GM and Chrysler helped these companies slash costs and cut debt. They, along with international automakers, are situated to fully participate in the fiercely competitive but profitable U.S. market. It is expected that the industry will be stable and able to support growth in coming years.

The complexity of vehicles made in the U.S. contributes to the large job-creating impact of the U.S. auto industry. The industry directly employs over 1 million people who are engaged in designing, engineering, and manufacturing new motor vehicles. Another 700,000 people are employed by dealerships located in nearly every community in the country. The automotive industry is a huge consumer of goods and services from many other sectors, including raw materials, construction, machinery, legal services, computers and semi-conductors, financial services, advertising, and healthcare, helping create many more jobs throughout the economy.

Along with changes in employment, the industry is investing in plants, opening new plants, and retooling others. In 2010 to 2011, the auto industry announced investments of over $18.1 billion throughout the U.S. More than half of these investments are being made in the Midwest. As the industry changes to keep up with new products, changing consumer tastes, and greater demands for skilled labor, new facilities are opened and older facilities are either retooled with new investment or closed.

Source: GM Media

In addition to automaker investments in the Midwest, General Motors and other companies have announced investments throughout the country. In January 2012, GM detailed plans to build a stamping facility in Arlington, TX.

While new investments present new opportunities for their communities, closed facilities represent tremendous challenges to their communities. The inventory of closed commercial and industrial building space is ready to be put into new uses and serve new industrial needs. For communities with these buildings that offer opportunity for repurposing, the Center for Automotive Research (CAR) has performed extensive research examining those traditionally automotive manufacturing facilities that have been successfully repurposed. With this research and experience, CAR works with communities to help them understand the conditions and strategies that can bring new uses, new employment, and new industry into unused facilities. Despite the challenges suffered within automotive and manufacturing communities during the recent economic recession, the auto industry's potential for technological innovation offers hope for a more promising future.

TECHNOLOGY

The auto industry of the past was an industry that used cutting-edge innovation and demanded constant creativity and invention. Likewise, today's industry demands high technology inputs and offers challenging knowledge-based and 'green' jobs.

The automotive industry is vibrant and high tech. With respect to the technology used in vehicles, the industry is undergoing radical changes. Adoption of new vehicle technologies relating to emissions, vehicle electronics, connectivity, fuel economy, safety, and powertrain represents opportunities for communities to attract companies and entrepreneurs to take advantage of skill sets, the trained workforce, educational institutions, and other assets throughout the Midwest.

The vehicle electronics market is growing rapidly. An average vehicle might contain around 60 microprocessors to run its electrical content, as compared to around only 15 microprocessors in a vehicle just 10 years ago. It is estimated that currently, vehicle electronics make up as much as 40-50 percent of the total cost of the vehicle. This is up from 20 percent less than a decade ago. As companies increasingly rely on vehicle electronics to comply with environmental and safety requirements, the automotive electronics market is expected to expand even more rapidly.

Today, electronics, in the form of sensors, actuators, micro-processors, instrumentation panels, controllers, and displays, appear in nearly all major vehicle systems, including:

- Engine controllers and sensors
- Safety systems
- Chassis control
- Measurement and diagnostics
- Entertainment
- Navigation systems
- Communications
- Emissions monitoring

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Electronics have introduced new functionality not possible in a purely mechanical framework. Modern vehicles contain electronic components in nearly all vehicle systems, including those pertaining to powertrain, passenger safety, and more. While all of these systems are important, several merit closer inspection, because they represent growth areas or because they are so critical to current and future vehicles. One of these systems is the powertrain, which is absolutely essential for the vehicle to operate. In addition, due to stricter fuel economy and emissions standards and the evolving mix of powertrain types (e.g., hybrids, electric, etc.), the powertrain characterizes a likely growth area for electronics.

Source: GM Media

Alternative powertrain vehicles will continue to be a source for future growth and development within the industry due to stricter fuel economy and emissions standards.

FIGURE 2: RENDERING OF CONNECTED VEHICLE SYSTEMS

Source: USDOT (2011).

Another path for future development is through vehicle communication systems. As shown in Figure 2, these technologies enable information sharing within and among vehicles, as well as between vehicles and mobile devices or roadside infrastructure. These communication systems contribute to greater capabilities in the areas of mobility, infotainment, and safety, where "mobility" refers to the ease and efficiency of travel and can include navigational assistance and traffic coordination. Infotainment systems include features such as navigation and entertainment.

Many of these features are brought into the vehicle through handheld devices such as 3G and 4G smart phones; the explosive growth in wireless communications presents enormous opportunities for vehicle technology that are difficult to predict at this time. Safety systems also go beyond communications and include a wide variety of features, from those that are now standard in vehicles, such as air bags, to those that are currently found only in high-end automobiles like lane departure warning systems.

Vehicle electronics also contribute significantly to improved environmental performance of motor vehicles, and thus electronics are an important enabler of "green" vehicle technology. These contributions come through several different mechanisms.

At the most basic level, electronics offer improved control to a variety of vehicle sytems, allowing for more efficient operation of engines and other powertrains, heating and cooling systems, etc. This results in less fuel (or other power) consumed and thus lower harmful emissions. Indeed, today's complex hybrid powertrains could not be operated and managed without an array of

electronics, including sensors, controllers, and actuators. Furthermore, electronics components tend to be lighter than the mechanical components that they replace, again leading to less demand for fuel and power options.

In the next ten years, electronics, in the form of vehicle communications and connectivity, will contribute in other ways, too. For example, as electronics bring traffic and mobility information into the vehicle and allow for even more efficient powertrain operations based on situational awareness and more efficient vehicle routing to avoid congestion, crashes, construction zones, etc., again improving fuel economy and lowering emissions.

In May 2009, the Obama Administration announced plans to raise the long-standing Corporate Average Fuel Economy (CAFE) standard from 27.5 miles per gallon (MPG) to 35.5 by 2016. After much review and discussion, the federal government, as well as a large block of automakers, recently came to an agreement that will require automakers' fleets to average 54.5 MPG by 2025. Such ambitious requirements will challenge American companies to provide the technologies required – and to add the capacity necessary to manufacture these technologies at the high production volumes necessary to satisfy a market as large as that of the United States.

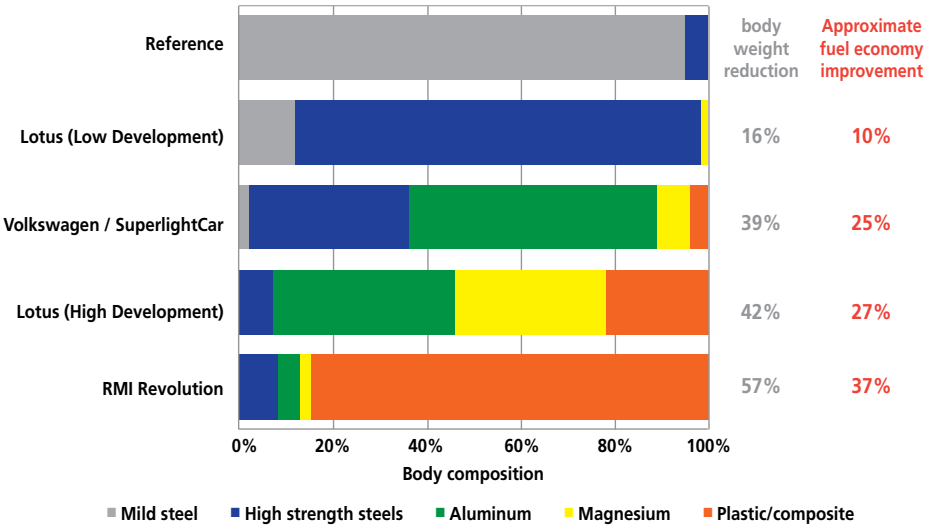
The U.S. is currently outpacing China in vehicle sales growth, as the annual number of light vehicles sold in the U.S. increased by 10.3 percent in 2011. Given the size and profitability of the U.S. market, international firms with appropriate technologies will increasingly look to locate here. A significant opportunity therefore exists for economic developers to attract to their communities international firms whose products improve vehicle emissions, fuel economy, safety, and connectivity. Because of the cutting edge technology involved, it is likely that communities which are the most effective in marketing their region's technical prowess, educated workforce, and connections to educational institutions will have the most success.

Beyond electronics, research and development (R&D) is ongoing for other key vehicle systems. To provide better fuel economy, automakers and suppliers strive to reduce the weight of cars while maintaining vehicle safety and cost effectiveness in production. Many estimate that a 10 percent reduction in vehicle mass will result in a 6 percent to 7 percent increase in fuel economy. Weight reduction is appealing to automakers because it tends to increase other performance factors valued by consumers. Ride and handling; noise, vibration, and harshness; braking; and acceleration all benefit from reductions in vehicle mass. Combined with the benefit to fuel economy, mass reduction is poised to be a major technology strategy deployed by automakers in the next 15 years. Up to a 250 to 750 pound reduction in average vehicle mass is expected by the year 2025, according to some forecasts.

There are several technologies that may be leveraged to reduce vehicle mass from today's standard vehicle. At the design level, new software technology is paving the way for a more systematic approach to vehicle design. Using simulation tools, engineers are able to model new vehicle designs that provide comparable levels of safety and performance yet require less material through more intelligent design schemes. Simulation software providers that are focused on a systems approach to vehicle mass reduction will benefit from the aggressive weight reduction required over the next 15 years. New optimization models that look at organic structures to determine the strongest and lightest vehicle designs are a recent development in design for lightweighting.

At the materials level, high strength steel, aluminum, magnesium, and composites are being constantly improved to provide the lightest material possible for a given application. Figure 3 depicts five different vehicle compositions, and reflects the significant body weight and fuel economy benefits that are associated with light-

FIGURE 3: LIGHTWEIGHTING VEHICLES



Material composition of lightweight vehicle body

John German, ICCT
EIA Energy Conference
April 26, 2011

R&D continues to contribute to the implementation of cutting-edge materials in vehicle composition. The vehicle pictured here is composed of sheet steel (gray), ultra-high strength steel (yellow), high-strength steel (red), hot-formed steel (green), and hardened sheet steel (blue).

Source: VW Media

weight materials. Organizations with manufacturing specialties in these advanced materials for automotive components are in the best position to benefit from automotive lightweighting.

The greatest challenge with new materials will be in forming and joining. At the integration level, new assembly and joining techniques are being developed to form and join these new materials in a robust and durable way. Forming technology is expected to be more of the evolutionary type as the materials may require some upgrades in tooling and modifications to forming processes. Joining technologies may require a more transformational approach as new materials are no longer able to be joined using traditional joining methods. Automotive lightweighting has an impact in all areas of vehicle design, development, and manufacturing.

These new developments in the automotive industry represent opportunities for communities to leverage their existing strengths in workforce capabilities, industry infrastructure, and plant capacity as well as providing opportunities for new investment. Automotive research and development spending and needs are expanding rapidly to keep pace with the demands for ever more sophisticated and effective new technologies. Communities with the right educational and workforce assets can position themselves to attract new research and testing facilities.

Investment in local schools and development of integrated vehicle technology programs such as the Indiana Advanced Electric Vehicle Training and Education Consortium (I-AEVtec) can be used to prepare the local workforce by providing the skills that will be required by automakers in the near future. Programs that bring together communities, educational institutions, and companies can also be used to establish a community as a automotive research center, facilitate relationships with companies, and generate new local businesses through technology transfer.

Traditionally the center for automotive manufacturing, Michigan still maintains dominance in automotive R&D spending and employment in the U.S., as shown in the state-by-state breakdown in Figure 4. In 2007, which is the latest year of data available from the National Science Foundation (NSF), the automotive industry spent $11.8 billion in Michigan while national automotive R&D spending was around $16 billion. The Michigan automotive R&D industry employs an estimated 65,000 professionals. Michigan is home to more than 330 automotive R&D companies with nine of the ten world's largest automakers conducting research at facilities in Michigan. Additionally, 46 of the 50 top global automotive suppliers have research facilities located in Michigan.

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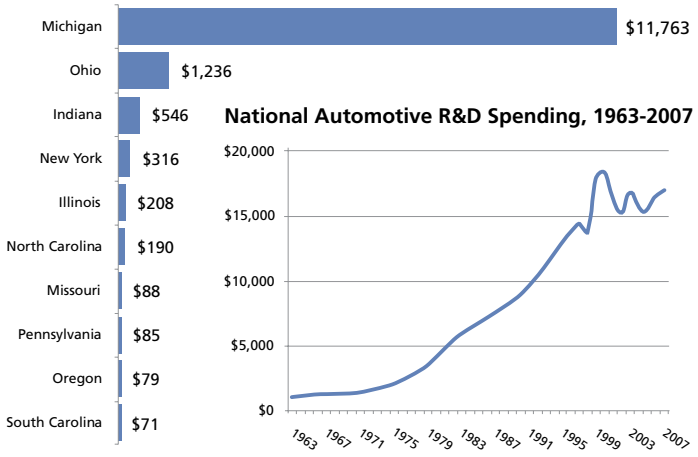
Michigan has a vast array of R&D facilities including automaker facilities, automotive supplier facilities, the EPA National Vehicle and Fuel Emissions Laboratory, and the U.S. Army Tank Automotive Research, Development and Engineering Center. The EPA lab, established in the 1970s, was an important establishment for attracting further investment in R&D facilities to the area, because automakers had to prepare vehicles for emissions testing nearby. While the major domestic automakers already had research and development facilities in Michigan, as international automakers entered U.S. markets, they established emissions testing prep facilities in Michigan to be in close proximity to the EPA lab.

This Michigan-centric focus of auto R&D efforts offers all Midwest communities good reason to build strong educational capabilities in advanced manufacturing, science, engineering, and technology fields as prospects for good jobs for graduates are very nearby.

FIGURE 4: AUTOMOTIVE R&D SPENDING, 2007 (in millions)



INTERNATIONAL INVESTMENT

Although the U.S. light vehicle market has been exceeded in terms of annual units sold by that of China, it remains the largest market in the world in terms of the value of the vehicles sold here. For international automakers and suppliers, this fact provides a market for more content per vehicle – while leaving more potential profit per unit – than perhaps any other market in the world.

The U.S. is, in fact, the largest source of profits for many international companies, even though those companies may achieve higher unit sales in other markets. This high profit potential has made the U.S. an attractive destination for automotive manufacturers, suppliers, and other supporting companies from around the world and provides economic developers with a powerful attraction argument.

Source: VW Media

Volkswagen's Chattanooga, TN, plant represents the potential for American communities to reap the benefits from international investment. The German automaker has invested $1 billion in the plant, which directly employs 2,000 workers. The investment has also attracted many supplier parts facilities to the area.

In pursuing investment from companies based overseas, economic developers have a wide range of options to consider, including trade missions, trade show exhibition, self-organized trips, and use of internet-based communication media. A wide array of consulting companies support communities in these functions. The federal government, through the Department of Commerce's Commercial Service, also provides communities with support in seeking international investors. The Commercial Service has operations in many of the world's largest cities and provides a long list of services at very reasonable cost.

CAR's experience in running international trade missions to a wide variety of destinations throughout Europe and Asia has provided several lessons for American economic developers. The most important of these lessons is that to be successful in attracting overseas investors, it is often most productive to actually travel to the target country, as opposed to only using local resources for marketing purposes. While cultural and business practice tradition varies widely from country to country, it is the relationships based on personal contact that seem most valuable in ultimately attracting an international investor to a community.

CONCLUSION

There is a fragile, but emerging economic recovery. The major assets for many Midwest communities include their existing productive and highly skilled workforce, advanced manufacturing infrastructure, inventories of commercial and industrial building space, and educational resources. CAR works with communities to help them develop their economies and infrastructure to support new products, technologies, and the needs of advanced manufacturing companies. Together, CAR and these communities are promoting a sustainable future built on an understanding of competitive business issues, the global reach of advanced manufacturing, and the environmental issues facing both communities and companies.

The Center for Automotive Research is a nonprofit organization based in Ann Arbor, Michigan. Its mission is to conduct research on significant issues related to the future direction of the global automotive industry, as well as organize and conduct industry forums. The Center for Automotive Research's Automotive Communities Partnership (ACP) has been addressing the needs of automotive communities for the past decade. The ACP brings together communities, international partners, automotive companies, educational institutions, and government agencies to advocate for the automotive industry.

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Auto

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