Case Studies in Sustainable Industries

The onset of the Industrial Revolution marked a major turning point in human history; almost every aspect of daily life was eventually influenced in some way. Since then we have seen the positive and negative affects of industrial manufacturing. Now it is time to rethink how industries can still operate and manufacture at the same rate while having smaller environmental and social impacts. This ideology is called Sustainable Industry. One reason to consider sustainable industries is because old manufacturing facilities have left many cities with brown fields. Can Sustainable Industries be adapted to work on an existing building or do they need to start with a brand new building? Are sustainable industries for large corporations or small businesses? After researching this topic some answers have been found and some are still unclear.

A single definition has yet to define what sustainable industry is because it can have different meanings to different people and situations. One definition suggests that sustainable industry is a business that has ecological innovation as a core part of their business model whose products come from a ‘green’ manufacturing facility. (Engineering News Record 2002) Another definition from the Portland Development Commission states, “Sustainable Industries may be defined as companies that provide a product or service whose use results in greater resource efficiency and/or a reduced negative impact on the environment”. (Portland Development Commission 2010) These sustainable products could come in the form of: “green building products/design, recycled products, sustainable agriculture, environmental remediation, or energy industries.” (Portland Development Commission 2010) Yet, a combination of the two definitions may provide the best solution.

Much of the information and literature written about the sustainable industry has little to do with the technical aspects of the building process and more to do with theory that discusses “maintaining sustainable practices with efforts that include industry-wide cooperation, governmental openness, and education reform.” (Satterfield and al 2009) Creating a sustainable industry goes beyond designing an individual building or product. One point that is really emphasized in multiple readings is that sustainable industry creates networks. This can be accomplished at the local scale all the way up to the global scale.

Bronstein defines industry as “distribution, repair, and recycling of manufactured goods”. (Bronstein 2009) A vital industrial sector fosters social equity, supports the economy, propels innovation, and builds economic resilience. (Bronstein 2009) Sustainable industries in theory should be able to provide all of these benefits to a city in addition to the environment and the community. Sustainable industry should be able to
increase jobs and businesses, while at the same time enhance the aesthetics of the community.

Sustainable industries can possess some or all of the following green building technologies. Conics Limited is an Australian company that focuses on urban growth suggest many ways to build sustainable industries: facilities can be powered partially or wholly by an alternative energy source such as photo voltaic cells, solar, wind, etc... Water can be heated by solar energy. Skylights reduce the need for electricity. Lights are energy efficient and dimmable. There are many more examples.

Aesthetics play a major role in how people experience and feel about a place. Bronstein adds, “The type of work being done inside a building doesn’t count; what matters is how a place appears to the average onlooker”. (Bronstein 2009) An industrial building of the past was not built to please visually, but produce goods efficiently. It is no surprise people do not like having a large, dull building taking up large amounts of land in their community or city. Consumers dislike working industries not only because of how it looks “but also what it signifies,” reminds Bornstein. (Bronstein 2009) Sustainable Industry will be more attractive due to the “green” building practices and will create a healthier environment and healthier people.

[Identify existing redevelopment]

One company practicing sustainable industry is the Ford Motor Company. The Ford River Rouge plant in Dearborn, Michigan “balances the business needs of auto manufacturing with ecological and social concerns in the redesign of a brownfield site,” said Ford Chairman Bill Ford. (The Greenroof Projects Database 2006) The original plant built in 1917 was not designed to be environmentally conscious. In 2000 the stormwater management plan was completed and began the redevelopment of sustainable Ford plant. Then, in 2003, the plant implemented a plan to redevelop with the environment in mind, at a cost of approximately $2 billion. (Engineering News Record 2002) In all, 1.7 million square-feet and over approximately 1,100 acres were to be redesigned. (Engineering News Record 2002)

[Best practices]

The stormwater management plan creates hedgerows lined with swales that provide filtration for rainwater. In terms of manufacturing, the facility includes pollution reducing practices, natural lighting, and energy-efficient heating, ventilation, and cooling systems. (Engineering News Record 2002) Other components of manufacturing include: improved recycling by 37% on paper, pallets, scrap metal, concrete, and cardboard. (Engineering News Record 2002) Sustainable designs for employees include: wood flooring inside the plant to reduce stress on workers’ feet and legs. In addition, light monitors and skylights ensure that work areas receive daylight. One of the ‘greenest’ features of the plant is the 10 acre green-roof, the largest of its kind in the United States. The green-roof is covered with soil and planted in sedum, a low maintenance perennial. The organic roof is designed to provide insulation and never need painting.
The green-roof is expected to last twice as long as a regular roof. (William McDonough + Partners 2010)

[Description of approaches]

With the plant being such a large facility, designers felt it crucial to create a habitat for animals that once occupied the land. (Engineering News Record 2002) Many nearby wetlands, woodlands, prairies, meadows, and forests have been preserved and a nature trail reaches around the plant for workers to enjoy. Now Canadian Geese and Killdeer are able to nest on the roof along with more than a dozen different types of wildlife. (The Greenroof Projects Database 2006) The design enhances the area, creates a better work environment for employees, and brings in revenue from the many tours that are given each year. (Engineering News Record 2002)

Source: (William McDonough + Partners 2010)

Below: The green roof and the increased vegetation

Source: (William McDonough + Partners 2010)

[design team]

Ford chose Architect William McDonough to lead the design team because McDonough preaches “environmentally benign and sustainable design”. McDonough believes in not only fundamentally altering buildings, but also “changing the way things are made, to make the planet a better place”. (Engineering News Record 2002) To complete the Master plan and stormwater management plan in 2000, lead Architect William McDonough + Partners collaborated with landscape architect Nelson Byrd Woltz and D.I.R.T. Studio. (William
Wischmeyer


[Timeframe]

Conversations began in 1997 for the redevelopment of this project. Ford contacted Architect William McDonough in May of 1999 to discuss the sustainable redevelopment of the plant. (Engineering News Record 2002) The Master plan and 600 acre stormwater management plan were completed in 2000. (William McDonough + Partners 2010) The first phase of the 20-year revitalization plan was completed in June 2003. (William McDonough + Partners 2010) The project is the beginning of a 20 year build out and will continue sustainable redevelopment for years to come.

[Analysis]

The Ford River Rouge Plant is working towards one of the largest sustainable industry’s we have seen. For one, the stormwater management plan is a major way the Ford plant is reducing its impact on the environment. The swales that catch rainwater help to reduce rainwater runoff and more naturally filter excess water back into the ground. In combination with the expansive green roof, which also absorbs excess rain water, the green roof and the swales help to reduce surface water runoff, and keep it from being polluted. The vast amount of greening that Ford did to the plant helps return portions of the landscape back to its natural state, allowing wildlife and other plants to make homes. Old industrial plants were large areas of concrete and steel. The fact that the ‘green’ industrial buildings are healthier allows nature and humans to be healthier living and working next to them. Another strength is the green roof, which will last twice as long as a regular roof. This will save the company money because it will not need painted and requires minimal maintenance. Not only will the green roof save the company money, but the plants helps to eliminate some of the pollution that plant is making.

Purely looking at the facility, Ford is doing a great job at reducing its impact on the environment. This is where Ford has some weaknesses. While the facility itself is reducing its impact on the environment. Unfortunately; the products, the vehicles, still play a major role in polluting and damaging the environment. So it seems Ford only fits a portion of the sustainable industry definition. However, because we live in a vehicle dominated society, cars are still in major demand. We cannot blame Ford for supplying the demand. But to further their sustainable practices Ford could start producing more vehicles that reduce emissions and are better for the environment. Overall, as a facility the Ford plant is making great strides in sustainable
practices, yet the product is still lacking in sustainability. Maybe one day Ford will be a sustainable industry and produce sustainable products.

[example 2 | existing industry]

You do not have to have an industry the size of Ford’s manufacturing plant to adapt to sustainable practices. The Melink Corporation, in Milford, Ohio, was founded in 1987. (Melink Corporation 2009) The Melink Corporation first started reducing energy waste “by developing the first variable-speed controller for commercial kitchen hoods”. (Melink Corporation 2009) In 2004, founder Steve Melink attended a conference where he learned about the United States Green Building Council’s LEED (Leadership in Energy and Environmental Design) rating system. That conference raised Melink’s vision and transformed the company. (Melink Corporation 2009) Shortly after, Melink designed and constructed a new headquarters that was LEED-Gold certified. Melink is clearly on the forefront of sustainability because at the time of this construction, it was the first in Ohio and one of only about 100 in the world. In addition Melink is committed to making their headquarters a net zero energy building by the year 2010. (Melink Corporation 2009) Melink’s ultimate goal is to promote a “triple bottom line” of economic growth, energy independence, and environmental health. (Melink Corporation 2009)

I contacted Jeremy Chapman, the Business Development Manager at the Melink Corporation to get some new updates on where the company stands with becoming a ‘net zero energy’ building. He informed me that Melink has recently become LEED-Platinum Certified for Existing Buildings, for operation and maintenance. (Melink Corporation 2009) This makes them one of only 25 buildings in the world to achieve LEED Existing Buildings Platinum. (Melink Corporation 2009) Some things they did to achieve this award include: “70% storm water mitigation to reduce their impact on waterways and sewer stems, reduce commute trips by 31% by car pooling, biking, and using fuel efficient vehicles, earning an Energy Star Rating of 97 out of 100, and generating 25% of energy used on-site from renewable resources”. (Melink Corporation 2009) Melink has not fully reached the ‘net zero’ energy. However, they are still working towards this goal. Currently, they are using solar energy, wind turbines at their headquarters. This year they are adding another wind turbine and more solar panels to the building to generate more of their own energy. Jeremy Chapman stated, “Finally, we are being more efficient with how we consume energy, the cheapest kWh is the one you do not have to produce”. (Melink Corporation 2009)

[best practices]

Melink is a corporation that thinks about completely sustainability. Not only is their headquarters LEED-Gold certified, but sustainability can be seen in their everyday practices, Melink states, “Our mission
Wischmeyer goes beyond buildings.” (Melink Corporation 2009) Melink leases a fleet of hybrid cars “and offers incentives for employees to live in green”. (Melink Corporation 2009) Employees even have a fitness center and green learning libraries at work. Melink uses 5% of their profits towards development in renewable energy technologies. (Melink Corporation 2009) This company “walks-the-talk”, and wants to inspire thousands of individuals and organizations to do the same. By practicing what they preach, Melink wants to show the world that “you do not have to be a GE, Wal-Mart, or Toyota to make a significant difference”. (Melink Corporation 2009)

[approach]

As a provider of energy-efficiency and renewable energy solutions for the building industry, Melink’s ultimate purpose is to help reverse global warming. (Melink Corporation 2009) Some of Melink’s renewable solutions include: a mass produced solar panel that generates energy for an average homeowner or small business, low-wind turbines for markets where large-scale turbines cannot be installed and where mild wind conditions prevail, and geothermal pumps which can be up to 50% more energy efficient than conventional systems. (Melink Corporation 2009) Melink also provides energy consulting. One of Melink’s most sought after products is the Intelli-Hood. (Melink Corporation 2009) This product sets new standards for commercial kitchen ventilation systems. This product can be used on new and existing facilities. It saves energy by automatically reducing the exhaust and make up air fan speeds during idle cooking conditions. (Melink Corporation 2009) This is accomplished with a temperature and optic sensor that detects heat and smoke load inside the hood. A few places that use this product are: Bob Evans, Macaroni Grill, Maggiano’s, Max & Erma’s, and Whole Foods. This product is used all over the country.

[analysis]

Melink is truly a sustainable industry from facility to product. Practicing sustainability at Melink goes beyond the founder, it is practiced through the employees and every days actions. The LEED-Gold certified headquarters, loaning hybrid cars to employees, and providing sustainable products are all things other small businesses can achieve. The Melink Corporation helps put into perspective that to be a sustainable industry, you do not need to be a giant corporation. Sustainable industries can work on small scales. Both Ford and Melink have green facilities, either through adaptive-reuse and building new. However, Melink seems to be more well rounded in sustainability, with sustainable products, and sustainable practices in their business choices and actions, while Ford seems to be pulling the ‘green’ over our eyes.
Bibliography

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