

Pollution Prevention & Energy Efficiency

*Building a Sustainable Business by
Turning Inefficiencies into Financial Gains*

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Northwest Michigan Sustainable Business Forum
Traverse City, MI



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about Delta

Mission: Improve Environmental Quality and Promote Community Economic Development in the Great Lakes Region.

Programs:

- **Pollution Prevention and Resource Conservation**
Policy development, technical assistance, green design, implementation financing
- **Brownfield Redevelopment**
Financing, land assembly, site control, remediation, community development capacity
- **Sustainability Programs**
Improve sustainability footprint, address environmental performance, and green purchasing
- **Emission Trading Markets**
Create community benefits through aggregation and trading of carbon offset credits



about the Delta P2E2 Center

The Delta Institute and its partners formed the Delta P2E2 Center to stimulate widespread adoption of pollution prevention and energy efficiency measures. Our strategy is simple:

- Help facilities cut energy costs
- Reduce pollution by becoming more efficient

We work with small- and mid-sized businesses and manufacturers, local government, school districts, and civic institutions to cut energy costs by 15 percent or more. Our services include:

- Technical Assistance, Investment Grade Audits
- Flexible Financing Options to assist in Implementation
- Carbon Aggregation, Baselineing, and Trading



about P2E2

P2 = Pollution Prevention

Pollution Prevention is:

- “any type of activity that reduces the amount of waste generated and/or pollution released in order to reduce risk to public health and the environment”*
- Source reduction is the first preference
 - Ex – toxic chemicals
- Reuse and environmentally-sound recycling techniques are the next preferences
 - Ex – water filtration

E2 = Energy Efficiency

Energy Efficiency is:

- “the volume of energy consumed per unit (or per dollar value) of production.”
- It is a metric that allows plant managers to evaluate a facility’s performance over time.
- Includes technological and behavioral change
- Key – energy efficiency is more than just lower fuel bills – the benefits of E2 accrue to others in the company

business case for P2E2

Industry competitiveness depends partly on smart resource use, including pollution prevention & energy efficiency

- Reduce expenses
 - Lower fuel bills
 - Reduced material waste & disposal fees
 - Avoided need for emissions control equipment
 - Improved reliability allows reductions in overtime labor and hazard insurance premiums

- Build Revenues
 - Extra production capacity provided by energy optimization helps manufacturers meet demand and build market share
 - Improved work conditions lead to increased employee productivity

- Obtain Federal Tax Deduction
 - Commercial Business Tax Deduction of \$.30 - \$1.80 per square foot for improvements to lighting, HVAC, building envelope

business case for P2E2

Industry competitiveness depends partly on smart resource use, including energy consumption

- Reduce Operating Risk
 - Energy efficiency offsets manufacturers exposure to volatile fuel prices and power supply concerns
 - Emissions and safety penalties are avoided
- Reduce Competitive Risk
 - The price of avoiding new technologies and process improvements is to endure the failure of aging assets and loss of business to competitors who gain advantages through innovation

additional benefits of P2E2

Economic:

- Become leaner and better able to weather economic downturns, market volatility
- Become more competitive, nimble
- Create additional cash flow for capital improvements, R&D, employees

Environmental:

- Reduce greenhouse gas emissions
- Conserve natural resources
- Reduce waste

Social:

- Enhance community relations
- Improve corporate brand



challenges of P2E2

- Technical Gaps
 - *Businesses do not have the expertise to make changes*
- Management Buy-In
 - *A problem, not a priority*
- Lack of Urgency
 - *Make changes when economy improves*
- Financing
 - *Businesses do not have the cash flow to make improvements*

The Mission of the Delta P2E2 Center is to help businesses overcome these barriers



how we work



P2E2 Center Process:

- Investment-Grade Audit – traditional audit with risk assessment component
 - Banks consider IGA’s as “due diligence,” lowering cost of financing
- Audit is fee-based or included in implementation financing.
- The P2E2 Center works with facility management to create the most effective implementation plan
- Many options for financing are available to facilitate installation of measures.
 - Efficiency Contracts
 - P2E2 Loans
 - Partner Loans at or below prime

case study Automotive Supplier Chesterfield, Michigan

Background: 50,000 square foot paint stripping facility

- Goal: Reduce operating costs to improve competitiveness

Recommendations:

Measure	Estimated Cost	Estimated Annual Savings	Estimated Electricity Savings (kWh)	Payback (Years)
Filter rinse water	\$60,250	\$14,025	-	4.3
Upgrade lighting	\$21,300	\$2,790	28,512	7.6
Eliminate leaks from air compressor	\$1,500	\$3,470	—	0.4
Perform berm maintenance	\$4,000	\$5,020	—	0.8
Total	\$87,050	\$25,305	28,512	3.4

- Potential to save 301,900 gallons of water, an approximate reduction of 15%
- Potential to reduce raw material use by 2,000 pounds

case study Real Estate Investor Grand Rapids, Michigan

Background: 5,000 sq. ft. building that houses various businesses.

Goals

- Implement a green building strategy that will achieve a high degree of energy efficiency, resource reduction, and pollution prevention.
- Serve as a model rehab for other commercial business owners.
- No water discharge

Recommendations:

Measure	Estimated Costs	Estimated Annual Savings	Estimated Gas Savings (CCF)	Estimated Electric Savings (kWh)	Simple Payback (Years)
Replace Windows, and add Solar Shading	\$14,000	\$4,902	984	17,500	2.8
Install Structural Insulated Panels (SIPs)	\$16,000	\$10,158	2,584	0	1.6
Upgrade Lighting	\$32,400	\$4,400	13	47,007	7.3
Installation of Green Roof	\$75,000	\$4,054	1,093	17,272	18.5
Total	\$137,400	\$23,514	4,674	81,779	5.8

case study Business Incubator Midland, Michigan

Background: 107,000 sq. ft. building that houses various businesses.

Recommendations:

Measure	Estimated Costs	Estimated Annual Savings	Estimated Gas Savings (CCF)	Estimated Electric Savings (kWh)	Simple Payback (Years)
Replace Existing Boilers	\$196,222	\$26,159	30,054	0	7.5
Replace Absorption Chiller	\$317,500	\$70,548	99,308	(211,857)	4.5
Replace Original Air Handling Systems	\$125,000	\$40,061	39,119	80,148	3.1
Install Variable Frequency Drive on Cooling Tower Pump and Fan	\$6,000	\$889	0	11,852	6.7
Install Dampers on Operational Hoods	6,500	\$8,500	6,875	26,660	0.8
Total Phase I Measures	\$651,222	\$146,157	175,356	(93,197)	4.5

case study Industrial Shelving Mfg, Quincy, Michigan

Background: 330,000 sq. ft. building

Measure	Estimated Cost	Estimated Annual Savings	Estimated Electricity Savings (kWh)	Estimated Natural Gas Savings (CCF)	Payback (Years)
Replace metal halide fixtures with T-8 fluorescent fixtures	\$ 195,840	\$ 48,664	585,735	—	4.0
Recover flash steam	\$ 2,800	\$ 1,300	—	1,560	2.1
Reduce compressed air leaks—automatic control valves	\$ 9,000	\$ 5,790	57,540	—	1.5
Reduce compressed air leaks—manual ball valves	\$ 900	\$ 5,790	57,540	—	0.2
Recover oven heat for space heating	\$ 131,580	\$ 60,910	—	73,130	2.2
Preheat oven combustion air	\$ 12,000	\$ 5,740	—	6,890	2.1
Install compressed air storage	\$ 1,080	\$ 2,280	32,880	—	0.5
Supply outdoor air to compressors	\$ 250	\$ 570	8,220	—	0.4
Reset office thermostats	\$ 0	\$ 430	4,800	110	—
Insulate ceilings in powder coating room	\$ 1,400	\$ 445	6,417	—	3.1
Total	\$ 354,850	\$ 131,919	753,132	81,690	2.7

case study Powder Coat Paint Mfg Caledonia, Michigan

Background: Company sought \$404,000 in financing for installation of sample prep line and lighting upgrades to achieve economic and environmental efficiencies.

Recommendations:

Measure	Estimated Cost	Estimated Annual Savings	Estimated Electricity Savings (kWh)	Payback (Years)
Install sample prep line	\$ 386,000	\$ 181,800	50,280	2.1
Upgrade lighting	\$ 4,400	\$ 950	13, 573	4.6
Reuse totes for quality assurance testing	\$ 695	\$ 4,950	—	0.1
Recycle raw material packaging wastes	\$ 1,000	\$ 675	—	1.5
Eliminate leaks from air compressor	\$ 1,800	\$ 2,400	—	0.8
Increase number of iterations for distilling solvents	—	\$ 1,138	—	—
Eliminate power factory penalty on utility bill by installing a capacitor	\$ 1,700	\$ 1,200	—	1.4
Total	\$ 395,595	\$ 193,113	63,853	2.0

final thoughts

Simple Measures you can implement tomorrow

- ✓ Turn off lights and equipment when not in use
- ✓ Adjust lighting to actual needs and use daylight
- ✓ Replace incandescent bulbs with compact fluorescent bulbs
- ✓ Install LED exit signs
- ✓ Maintain HVAC system twice per year
- ✓ Install occupancy sensors & programmable thermostats
- ✓ Buy Energy Star office equipment
- ✓ Consider an energy efficiency assessment from an independent expert

final thoughts

- Energy efficiency is the quickest and most effective way to control energy cost and use.
- Pollution prevention and energy efficiency are more of an economic issue than it is a environmental one.
- In a market economy, inefficient businesses and manufacturers are at a competitive disadvantage.

By implementing pollution prevention and energy efficiency measures, you can turn your inefficiencies into financial gains and ensure that your company will remain competitive and profitable.

final thoughts

Resources

- Alliance to Save Energy
-www.ase.org
- Midwest Energy Efficiency Alliance
-www.mwalliance.org
- Great Lakes Regional Pollution Prevention Roundtable
-www.glrppr.org
- Great Lakes Renewable Energy Alliance
-www.glrea.org
- GreenBiz
-www.greenbiz.com
- State of Michigan Energy Office
-www.michigan.gov/cis
- Michigan Department of Environmental Quality – Environmental Science and Services Division
-www.michigan.gov/deq/0,1607,7-135-3306_28606---,00.html
- Michigan Dialogue to Reduce Energy Use (Bulletin Board)
-www.reduce-energy-use.com

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