

Delta P2E2 Center

The Delta Pollution Prevention and Energy Efficiency (P2E2) Center is changing business operations for the better. We provide expert technical assistance and flexible financing to reduce pollution and energy costs by at least 15 percent. We also trade carbon credits on the Chicago Climate Exchange.

about us

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 and reduce pollution by becoming more efficient. We work with small- and mid-sized manufacturers, local government, school districts, and civic institutions to cut energy costs by 15 percent or more.

What we do

Our technical assistance identifies efficiency measures that will save money and protect the environment. We provide a range of financing programs to implement the most promising measures. We also buy and sell carbon credits on the Chicago Climate Exchange on behalf of companies, and we pool and trade carbon credits generated from carbon sequestration projects on behalf of farmers and landowners.

How we work

A facility contracts with the Delta P2E2 Center for an investment grade audit. Specialized contractors conduct the audit to identify opportunities to improve energy efficiency and reduce pollution. Technical underwriting determines which recommendations are feasible to implement and promise to provide expected savings. The cost of the audit and underwriting can be rolled into financing for projects the facility eventually undertakes. This limits up-front costs for big long-term savings.

For projects identified as feasible and worthwhile, the Delta P2E2 Center tailors a financing package to the facility's needs. The Delta P2E2 Center provides direct financing through efficiency contracts or loans, and also arranges loans through our financial partner, LaSalle Bank. Terms and conditions of financing programs are subject to financial underwriting.

Contact Us

Delta P2E2 Center staff will visit your facility, consult with you, and identify potential money-saving opportunities. For additional information, contact:

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case study **Industrial Shelving Manufacturer** Quincy, Michigan

An investment-grade audit by engineers from the Delta P2E2 Center found more than a dozen opportunities for a shelving manufacturer in Quincy, Michigan, to save money by using energy more efficiently—even though the facility was extremely well run.

The company manufactures custom industrial shelves and ships them via flatbed trucks for onsite assembly at the customer's facility. Manufacturing operations in the 330,000 square foot plant include metal machining, welding, a five-stage wash and rinse system, and painting.

The Quincy facility uses approximately 64,000 million Btus (MMBTU) of energy per year, at a total annual cost of \$750,000, to power the equipment that fabricates and paints its products. Natural gas supplies 45,963 MMBTUs—72 percent of total energy consumption. Electricity accounts for 28 percent of total energy use, or 18,076 MMBTUs (5.3 million kWh) per year.

If the Quincy company were to implement all of the audit's recommendations, the facility would realize annual electricity savings of 15 percent and natural gas savings of 18 percent.

case study **Industrial Shelving Manufacturer** Quincy, Michigan

Project	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	—	4.1
Install automatic doors on powder coating rooms	\$ 1,770	\$ 2,000	25,547	—	1.1
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
Relocate air dryer from powder coating room	\$ 250	\$ 230	3,360	—	1.1
Install compressed air storage	\$ 1,080	\$ 2,280	32,880	—	0.5
Install loading dock walls	\$ 12,000	\$ 4,170	—	5,010	2.9
Supply outdoor air to compressors	\$ 250	\$ 570	8,220	—	0.4
Reset office thermostats	\$ 0	\$ 430	4,800	110	—
Reduce powder coating room air supply	\$ 5,300	\$ 880	12,075	—	6.0
Insulate ceilings in powder coating room	\$ 1,400	\$ 445	6,417	—	3.1
Total	\$ 374,170	\$ 139,199	794,114	86,700	1.95

Implementing these projects would benefit the environment, too, by reducing emissions of carbon dioxide, criteria pollutants, and volatile organic compounds:

CO2	1,253 tons/yr
NOx	1.3 tons/yr
SO2	3.2 tons/yr
Particulate matter (PM10)	91.5 lbs/yr
VOC	26.45 lbs/yr
Mercury	0.026 lbs/yr
CO	251.7 lbs/yr

case study [Powder Coating Paint Manufacturer](#) Caledonia, Michigan

An investment-grade audit conducted by Delta P2E2 engineers at a Michigan-based powder coating paint manufacturer found that one relatively simple process change could save the company more than \$180,000 a year and also produce significant environmental benefits.

At the factory, powder coat pigments are mixed, processed via mechanical heating and extrusion, and packaged. Facility operations include mechanical mixing of dry and wet raw materials, heated extrusion, packaging, and quality control activities. The company wants to expand capacity by 300,000 pounds of product per year.

The facility currently uses approximately 123,100 CCF of natural gas per year at a total cost of \$95,400. Electricity costs come to \$225,600 per year for approximately 3.4 million kWh.

Delta's analysis of plant operations identified a total of 11 opportunities to conserve energy and reduce pollution. Further technical underwriting determined which opportunities were most feasible and eliminated four. The Delta P2E2 Center is putting together a financing package to help the company move forward on the remaining seven projects.

Project	Cost	Annual Savings	Payback (Years)
Install sample prep line	\$386,000	\$181,800	2.1
Upgrade lighting	\$ 4,400	\$ 950	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 factor penalty on utility bill by installing a capacitor	\$ 1,700	\$ 1,200	1.4
Total	\$395,595	\$193,113	—

Currently, the company uses its entire production line to test for quality assurance. When technicians identify product that is not up to standards, time and effort are required to rework the nonconforming product back into the system.

Delta P2E2 engineers collaborated with the company’s maintenance and technical staff to conceptualize and refine a different approach: installing a small-scale (bench-size) powder-coat line to test batch samples for quality. The sample prep line will free up the full-scale line to manufacture product rather than test it. Doing so will boost plant capacity and improve efficiency while reducing the company’s environmental footprint. Installing a sample prep line will reduce the amount of nonconforming product and also reduce solid waste—including waste PVC, resins, fine dust, and off-specification product—which the company currently pays to send to an off-site landfill. There’s an upstream benefit, as well—fewer raw materials will produce the same amount of product. Simply by installing the prep line and upgrading the facility’s lighting, the company can realize significant environmental and economic benefits.

Project	Economic Benefits	Environmental Benefits
Install Sample Prep Line Use a bench-scale powder coat line to test batch samples for quality instead of using the full production line.	A new sample prep line will increase plant capacity and sales by 300,000 pounds of product per year. Net cost savings of approximately \$181,800 per year if increases in capacity are realized.	Electricity savings of 50,280 kWhr/yr, even with the increase in plant capacity = annual air pollution savings of: CO2- 39 tons NOx- 169 lbs. SO2- 355 lbs. If the plant expanded capacity without a sample prep line, the company would send an additional 37,560 lbs/yr of solid waste to a landfill. If the plant expanded capacity without a sample prep line, raw material usage would increase by: Resins: 1,600 lbs/yr Non-conforming product (reworked into product): 68,250 lbs/yr.
Upgrade Lighting Replace 20 metal halide fixtures with 20 T-8 fluorescent fixtures.	Net cost savings of approximately \$1,000 per year.	Electricity savings of 13,573 kWhr/yr. = air pollution savings of: CO2- 11 tons NOX- 46 lbs. SO2- 96 lbs.

case study [Automotive Industry Supplier](#) Chesterfield, Michigan

An investment grade audit of a plant in Chesterfield, Michigan, shows how even small, relatively inexpensive process changes can start paying off in less than a year, and over the long term return many times their initial cost.

A 50,000-square-foot paint stripping facility in Chesterfield, Michigan, is a major supplier to the automotive industry, and its quality management system meets international standards (ISO 9000 certified). The plant performs two types of processes: paint stripping of metal parts, and chemical blending. Paint is removed thermally (by pyrolytic ovens), chemically, and physically (by blasting with zinc shot or water). Electricity and natural gas run these processes. Maintaining the temperature of the chemical baths and running the paint-stripping ovens are the primary energy uses in the plant, although energy is also used to heat the facility.

The following table summarizes the facility's energy, water, and chemical use.

Parameter	Annual Usage	Unit Rate	Annual Expenditure
Electricity	896,000 kWh	\$0.0976	\$ 87,400
Natural Gas	379,900 CCF	\$ 0.80	\$300,000
Water	1,985 kgal	\$ 3.97	\$ 7,700
Water Treatment	1,093 kgal	\$ 28.61	\$ 31,330
Chemicals	31,679 gal	variable	\$260,000 (approx.)
Waste	160 yd ³	\$ 550 per 20 yd ³	\$ 4,400

case study [Automotive Industry Supplier](#) Chesterfield, Michigan

Delta P2E2 Center engineers came up with twelve recommendations to help the company operate more efficiently. Of these, technical underwriting eliminated six projects as infeasible. A cost/benefit analysis of the remaining six looks like this.

Project	Implementation Cost	Annual Savings	Payback (years)
Filter rinse water	\$60,250	\$14,025	4.3
Upgrade lighting	\$21,300	\$ 2,790	7.6
Pyrolysis Oven - Warm Air and Tank Heating ¹	\$13,000	TBD	TBD
Subtotal	\$93,550	\$16,815	—
Eliminate air compressor leaks	\$ 1,500	\$ 3,470	0.4
Retrofit caustic tank	TBD based on use of existing equipment	\$ 6,400	<1
Perform berm maintenance	\$ 4,000	\$ 5,020	0.8

¹Does not include the cost of capital for materials or labor during implementation. Only encompasses costs for further analysis, design, and coordination.

Company managers are hesitant to implement the first three projects on grounds that the payback period is too long, and projected savings insufficient, to justify the cost. Projects 4-6, however, are extremely affordable. Each project will pay back the initial investment many times over during the next five years.

The first two projects promise the most significant environmental benefits, as shown below. The Delta P2E2 Center has offered to arrange a financing package to make these projects more affordable.

Project	Environmental Benefits
<p>Filter Rinse water Use a package filtration system to filter rinse water used to clean parts after the caustic treatment process.</p>	<p>Savings of 301,900 gallons of water used for rinsing parts. Represents approximately 15% of plant water use and 75% of the 400,000 gallons of rinse water used per year.</p> <p>Reduced raw material use in caustic treatment tanks: Butyl carbitol: 60 gal/yr Sodium gluconate: 11 gal/yr Potassium Hydroxide: 19 gal/yr Potassium Hydroxide: 19 gal/yr</p> <p>Reduced raw material use of wastewater treatment chemicals: Ferrous sulfate: 1,400 lbs/yr Alum chloride: 260 lbs/yr</p>
<p>Upgrade Lighting Replace 55 metal halide fixtures with 75 T-8 fluorescent fixtures.</p>	<p>Electricity savings: 28,512 kWhr/yr (3% of total facility electrical use)</p> <p>Potential emissions reductions: CO2- 28 tons NOX- 118 lbs. SO2- 255 lbs.</p>

partners

Partnerships are a hallmark of the Delta Institute approach to ensuring a sustainable future for the Great Lakes region. We formed the Delta P2E2 Center with the help of many other organizations, and we continually look for opportunities to create and leverage resources to promote pollution prevention and energy efficiency.

Funders

The Delta P2E2 Center is supported by private and public grants, as well as program- related investments. Funders include:

Great Lakes Protection Fund

LaSalle Bank

Joyce Foundation

U.S. Environmental Protection Agency

Project Team

The Delta P2E2 Center is operated by a team of the following organizations:

The Delta Institute

Overall project management, investment grade audits, technical underwriting, carbon offset aggregation, and implementation financing.

The Arwood Group

Manages marketing and pipeline development.

Michigan Certified Development Corporation

Provides financial underwriting.

Sonnenschein Nath and Rosenthal

Provides legal review.

LaSalle Bank

Serves on the Delta P2E2 Center loan committee.

Northern Trust Bank

Serves on the Delta P2E2 Center loan committee.

Valerie Denney Communications

Provides public relations support.

carbon trading program

Controlling greenhouse gas emissions is fast becoming a management priority. Analysts predict that even for companies not directly subject to greenhouse gas regulation, significant emissions will eventually increase costs or reduce sales.

In North America, the Chicago Climate Exchange (CCX®) is a member-based market for trading carbon credits obtained by reducing greenhouse gas emissions. The Delta P2E2 Center helps companies, farmers, and landowners get involved in carbon trading on the CCX® by providing the following services.

Carbon Baseline Analysis

Our experts work with direct emitters, such as manufacturers, and indirect emitters, such as office-based service companies, to fulfill Chicago Climate Exchange requirements.

Develop a Carbon Emissions Footprint A carbon emissions profile takes into account all activities that generate greenhouse gases, such as manufacturing and facility operations, corporate travel, and energy use. To develop the profile, we assess corporate data on carbon emissions, identify gaps, and fill them. This information is used to calculate a carbon emissions baseline and establish protocols for tracking changes in a company's footprint moving forward.

Create Carbon Credits The Delta P2E2 Center works with companies to design pollution prevention and energy efficiency strategies for reducing their carbon footprint—in some cases by a sufficient amount to generate carbon credits. Financing to implement these strategies is available through the Delta P2E2 Center.

Carbon Offset Aggregation

Both carbon dioxide and methane are greenhouse gases that contribute to global warming. The Chicago Climate Exchange specifies a range of eligible conservation practices [link to first bullet below] for reducing these greenhouse gases and allows benefits from these practices to be quantified, credited, and sold. Credits are aggregated, or pooled, from many different producers and landowners for sale to CCX® members—large companies, municipalities, and institutions that have made voluntary commitments to reduce greenhouse gas emissions. These organizations agree either to reduce their own emissions or to offset their emissions by purchasing credits generated by other organizations or by farmers and landowners.

Quantify Credits from Eligible Conservation Practices Experts from the Delta P2E2 Center can help farmers and landowners identify, quantify and aggregate credits resulting from eligible conservation practices.

Conservation Practices

No-till, low-till, and ridge-till farming are eligible practices for generating carbon credits. Producers or landowners must make at least a five-year contractual commitment to employ these practices. Carbon benefits are credited at .5 metric tons of carbon dioxide (CO₂) per acre, per year.

Grass Plantings

Producers or landowners must make a five-year contractual commitment to maintain grass plantings. Grass plantings implemented after January 1, 1999, can be credited at 0.75 metric tons of CO₂ per acre, per year.

Methane Digesters

Eligible methane digesters are those that were in operation any time after 1999 and have installed biogas flow monitoring and/or electrical metering equipment. Methane is credited at 18.25 metric tons of CO₂ per ton of methane, per year.

Tree Planting

Eligible projects include afforestation (allowing forests to regenerate naturally), reforestation via plantings, forest enrichment, and passive reforestation. Projects can be enrolled if plantings were initiated on or after January 1, 1990, on land that was not forested or on forest land that was degraded on December 31, 1989. Tree plantings can be credited up to 7.7 metric tons of CO₂ per acre, per year.

carbon trading program

Aggregate and Trade Credits The Delta P2E2 Center serves as aggregator to sell carbon credits on behalf of producers or landowners. All credits are traded on the Chicago Climate Exchange (CCX®). The market price per metric ton of carbon varies.

For current market prices see www.chicagoclimatex.com. Sale proceeds are returned to the producer/landowner minus a per-ton trading fee from CCX®, and an aggregation fee.

Enroll in the Carbon Trading Program Contact the Delta P2E2 Center for an application form and standard contract, then complete and sign the forms. CCX® requires that these be verified by an independent party. The Delta P2E2 Center, as aggregator, will arrange for verification. Once verification reports are sent to CCX®, trading can occur.

Contact Us

For more information on the Delta P2E2 Center's Carbon Trading Program, contact:

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financing

The Delta P2E2 Center connects facilities to a number of options for financing technical assistance and the costs of implementing pollution prevention and energy efficiency measures.

Efficiency Contracts Through efficiency contracts, the Delta P2E2 Center provides direct funding for pollution prevention and energy efficiency initiatives. Contracts are tailored to a facility's needs. We can finance up-front technical assistance and project implementation costs. Facilities agree to repay the Delta P2E2 Center with a percentage of the operating savings that result from the project.

P2E2 Loans The Delta P2E2 Center provides conventional pollution prevention and energy efficiency loans at a competitive interest rate.

Partner Loans The P2E2 Center can connect a facility to pollution prevention and energy efficiency loans from our financial partner, LaSalle Bank. The facility negotiates terms and conditions directly with LaSalle Bank.

Combination Loans In some cases, the Delta P2E2 Center and LaSalle Bank team up to finance a project. For example, LaSalle Bank may provide a loan for equipment costs, and the P2E2 Center may provide a loan for technical assistance costs associated with a pollution prevention or energy efficiency project.

technical assistance

Our expert technical assistance helps manufacturing, commercial, government and nonprofit organizations analyze and implement pollution prevention, energy efficiency, and carbon-trading opportunities that hold the most promise for their facilities.

Investment-Grade Audits Our investment-grade audits examine opportunities to conserve energy and water, curtail production of wastewater and solid waste, and reduce chemical inputs. We look for measures that promise sufficient improvements in efficiency—and hard-dollar savings—to warrant financing. A qualified contractor with expertise in your facility's processes performs the audit and provides a report for your review. The report calculates baseline energy and pollution management costs, implementation costs and payback periods for various improvement options, and the capacity of your facility to implement them.

Technical Underwriting Technical underwriting determines which options identified in the investment-grade audit make most sense for your facility to implement. We base our analysis on several factors, including realistic assessments of efficiency improvements, ease of implementation, costs and predicted payback, and environmental and economic impacts. Our technical underwriting produces a short list of top-priority measures for your facility to implement. If you need help connecting to financing, we provide it.

Baseline Analysis of Carbon Emissions The Delta P2E2 Center helps companies evaluate their carbon footprint. We work with direct emitters, such as manufacturers, and indirect emitters, such as office-based service companies, to develop carbon emissions footprints in accordance with Chicago Climate Exchange requirements. For details, check out our Carbon Trading Program.