Boston Green Tourism

ICS Presents:
Saving Electric Motor Energy

With
Smart Drive Technology

@ Seaport Hotel & World Trade Center (Boston)
**Thomas Alva Edison** an American inventor and businessman. He developed many devices that greatly influenced life around the world, including **DC ELECTRIC POWER**

**Nikola Tesla** a Serbian American electrical engineer, mechanical engineer, and futurist best known for his contributions to the design of the **AC alternating current electricity supply system**
Three Phase Power

- Phase 1
- Phase 2
- Phase 3
- Common

Voltage

Time

1/60 second

1/180 second
Global Electrical Energy Consumption by Sector

Electric Motors Account for 71% of Total World Energy Consumption

- Fans & Pumps: 19%
- HVAC: 16%
- Lighting: 14%
- I.T. and Electronics: 51%
- Other motors: 19%

Source: IMS Research 2005
Who Are We?

A Bit of History

- ICS is a 3rd generation organization founded by William Fritz in 1955.
- We have provided VFD Technology for over 35 years.

ICS Experience

- We were recruited by Chip Mannarino of Mass Electric to implement VFD Technology at Milton Bradley Toys.
- For over 25 years now, ICS has been working closely with National Grid, Eversource and many other power companies since the pilot project.
- ICS implemented the first Energy Efficient Program for Variable Frequency Drives (VFD) on plastic molding facilities in the country.
The Smart-Drive Retrofit Solution

By Retrofitting Existing Equipment the customer is able to:

- Immediately starts saving energy.
- Saves money from purchasing a costly new equipment.
- Reduce maintenance and repair costs.
- Increase the longevity of the retrofitted machinery.
- Save Money, Time and Effort.
What are Smart-Drive Motor Controls?

ICS Smart-Drive Motor Controls
Intelligently Tuning Electric Motor Power

A VFD, or Variable Frequency Drive, is a controller for input electrical signals. The ICS Smart-Drive controls the speed and torque of an AC motor by converting the incoming line voltage and frequency into a variable output to specified parameters. These parameters of our equipment can be set from machine processes, such as Temperature and Pressure, or from PLC/setpoints control.

At ICS Corp we have over 30 years of experience with VFD technology and implementation in electric motor control systems in a wide range of applications.
Our Smart Drive (VFD) Features

- Energy Saving for Fan & Pump Applications
- High Design Efficiency
- Fire Override Mode
- Easy To Install and Use
- Low Harmonic Distortion
- Reduces Supply Total Harmonic Current Distortion (iTHD)
- Reduces total Supply Current
- Reduces cable and busbar rating requirements
- Reduces fuse sizes
- Reduces required supply transformer load or rating
- Future Proof IE4 Motor Control
- Standard Induction Motors
- Permanent Magnet AC Motors
- Brushless DC Motors
- Synchronous Reluctance Motors
- Constant or Variable Torque selectable
- Maximum motor efficiency
- Built In EMC Filters
- Compliance with global EMC Standards
- Quiet Operation
- Temperature controlled cooling fans operate only when required
- PWM switching technique reduces motor audible noise
Simple VFD Setup
Systems Integration

Smart-Grid Building and System Integration:
Networking with your Management System

Our equipment has built-in Microprocessors to network with all of the Building Management Systems (BMS) through input methods including Control Protocols, Ethernet, Digital, Analog, Modbus, and more.

Our experience with old and new technologies allows us to seamlessly integrate with a multitude of systems and networks. Our System Engineers make sure that all of your equipments works together seamlessly.
Easy To Use Software

Supports two key functions - Drive Programming & Commissioning
Parameter Upload, Download & Storage
Changed Parameter Highlighting
Parameter List Printing
Knowledgeable Staff and Technicians
Access to the Worlds Best Products

PDC Corp knows existing machinery. We are able to fully integrate with any
existing Process and fine-tune the energy needed for many motor types and
applications.

With PDC Corp we have combined our knowledge and expertise to create a product
of the highest quality. We seek out partners who offer the best Variable Drives for
our product, and we are proud to offer a selection engineered from both Toshiba
International and Delta Worldwide.

Retrofitting existing machinery we are able to drastically reduce the amount of
energy needed to run the process, so your equipment experiences less wear and
thus extending its effective lifespan and eliminating the need to purchase new
equipment.
ICS Complete Solution

What we do for our Customers

✓ Complete and submit all Applications forms for Project Funding.
✓ Confirm Pre-approvals Funding from the Utility Provider.
✓ Design and Engineer the Preapproved Project.
✓ Submit a full Proposal and Project Scope with Savings Estimates to Customer.
✓ Work with the Customer Schedule to Retrofit the Installation.
✓ Coordinate with Utility Company to Conduct Pre and Post Inspections of the Retrofit.
What Kind of Equipment is Eligible?

We are able to Service Any Electric Motor 1 Horse Power and above which runs at least 2000 hours annually.

Utility Companies *already offers* Rebates for many prescribed applications including:

**Fans**
- Building Exhaust Fans
- Cooling Tower Fans
- HVAC Return and Supply Fans
- Process Exhaust Fans
- Make Up Air fan
- Garage Exhaust Fans

**Pumps**
- Chilled/Condensed Water Pumps
- Water/Waste Supply Pumps
- Hot Water Circulation Pumps
- Boiler Feed Pumps
- WS Heat Pump
Custom Applications

We also work quite a bit with fulfilling Custom Projects including:

- Motors over 150 HP
- Medium Voltage Motors
- Injection Molding Machines
- Extrusion Lines
- Grinders
- Air Compressors
- Refrigerant compressors
- And more

Even if the equipment is not included in the Prescriptive application, we will develop and Apply for a Custom Project!
Rebate Programs

Energy Grants & Rebates

By working closely with Energy Service Providers and Incentivizes around the Northeast, ICS Corp has gained unique knowledge of available Energy Rebate and Incentive Programs. Let us fill out all of the Paperwork for you. We will ensure that your Application is filed correctly and passes all guidelines to get you the most incentive for your Energy Saving Project.

We will apply for the equipment in your facility and ensure you get the largest incentive possible for your project.

Many items fall in prescriptive incentive brackets, allowing for quick rebate turnaround, but if some equipment does not fit this prescriptive form, we will engineer a custom application for your project.

We work closely with Energy Representatives from various Utility Providers to learn how to effectively navigate their respective incentive programs.

Once our application has been approved we will provide you with a full proposal outlining the entire scope of the project specifications.
Light Industries

Light Commercial
Cleaners, Car Washes, Hotels and Retail Facilities.

Commercial Facilities of this type have saved over 171,000 kWh annually.

We are able to integrate our technology with Vacuum Pumps, Cooling Tower Pumps, Fans, Coolers, Air Compressors and more.

**Snapshot Savings:**

Cleaners in Lowell, MA

National Grid Incentive: $31,800.00

Savings *

171,290 kWh saved annually
Power Rate: 12 cent/kW
$20,554.80 Annual Savings
$102,744.00 5 Year Savings
Commercial Application

Large Commercial

Commercial Buildings, Hospitals, Colleges, and Universities.

One of our Large Commercial Customers have saved over 1.7 million kWh annually.

Electric Motors are everywhere! Exhaust Fans, Process Cooling Pumps, compressors, Chillers, and HVAC motors are eligible for great rebalte incentives.

**Snapshot Savings:**

1,000,000 sq-ft Commercial Complex

National Grid Incentive: $305,450.00

**SAVINGS**

1,785,005 kWh saved annually

Power Rate: 12 cent/kW

$214,200.00 Annual Savings

$1,071,003.00 5 Year Savings
Municipal Application

We have saved over 893,000 kWh a year by remoting our motor control systems! Municipalities, Libraries, Water & Waste Facilities, other Municipal buildings.

On equipment we regularly work with Water Supply Pumps, Exhaust Fans, Compressors, Cooling Tower Fans, and Hot Circulating Pumps.

**Snapshot Savings:**
A local Water Supply Plant installed our motor controls on every electric motor used in the facility with amazing results.

National Grid Incentive $ 179,200.00

**SAVINGS**
1,150,102 kWh saved annually
Power Rate: 12 cent/kW
$ 138,012.00  Annual Savings
$ 690,061.00  5 Year Savings
Power Plant

Savings Snapshot:
Installation and Integration of 45 Motor Controls in a 2.5 Megawatt Power Plant

The Project
Inlet and outlet Draft Fans, Cooling Tower Fans
Boiler feed pumps, Hydraulics, and Compressors with integration to a Building Management System

The Results
4.5 Million kWh saved annually
30% reduction in plant Energy Consumption

Detailed Savings*
4,584,484 kWh saved each year
$ 458,448.00 Yearly Savings
$2,292,242.00 5-Year Savings
# 800 HP Fan Savings Analysis

<table>
<thead>
<tr>
<th>Savings</th>
<th>Without VFD’s Installed</th>
<th>With VFD’s Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual kWh Usage</td>
<td>3,446,530 kWh</td>
<td>1,898,400 kWh</td>
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<tr>
<td>Annual kWh Savings</td>
<td></td>
<td>1,548,120 kWh</td>
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<tr>
<td>Annual Electrical Costs</td>
<td>$344,652</td>
<td>$189,840</td>
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<tr>
<td>Annual Electrical Savings</td>
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<td>$154,812</td>
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<tr>
<td>5 Year Total Energy Costs</td>
<td>$1,723,260</td>
<td>$949,200</td>
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<tr>
<td>5 Year Total Energy Savings</td>
<td></td>
<td>$774,060</td>
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</tbody>
</table>

5 Year Electrical Cost for 800 HP Fan

![Graph showing 5 Year Electrical Cost for 800 HP Fan](image)
### 5 Year Total Electrical Savings Analysis

<table>
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<tr>
<td>Annual kWh Usage</td>
<td>11,746,516 kWh</td>
<td>7,162,032 kWh</td>
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<tr>
<td>Annual kWh Savings</td>
<td></td>
<td><strong>4,584,484 kWh</strong></td>
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<tr>
<td>Annual Electrical Costs</td>
<td>$1,174,651</td>
<td>$715,203</td>
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<tr>
<td>Annual Electrical Savings</td>
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<td><strong>$458,448</strong></td>
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<tr>
<td>5 Year Total Energy Costs</td>
<td>$5,873,258</td>
<td>$3,581,016</td>
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<tr>
<td>5 Year Total Energy Savings</td>
<td></td>
<td><strong>$2,292,242</strong></td>
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</tbody>
</table>

#### 5 Year Electrical Cost

![5 Year Electrical Cost Graph](image)

[VALUE] [VALUE]
Small Drive Enclosure
Shipping and Installing VFD at Customer Site
Testimonials From Our Customers

https://Pinetree Testimonial

https://Blackstone Testimonial

https://BNZ Testimonial