

# Solutions Process Energy Solutions Energy



## Why is energy conservation a hot topic?

*A third of all energy is consumed by the industrial sector. With continuing fluctuations and rising energy costs, companies are taking action to reduce their energy consumption.*

*Reducing energy usage in the manufacturing process is essential to controlling costs and maintaining a competitive advantage.*

*As we move toward a carbon constrained economy, worldwide pressure to reduce greenhouse gases and our carbon footprint may affect nearly every facet of our lives.*

MEGTEC is the recognized leader in air handling, air distribution and thermal air management in the markets it serves. With over 40 years of process experience and more than 20,000 installations of industrial dryers and ovens, solvent recovery systems, oxidizers, heat recovery systems and other equipment, MEGTEC is uniquely positioned to integrate and optimize the functionality and energy usage of industrial processes in order to save you money.



## What drives your plant energy costs?

*Much of a manufacturing facility's energy consumption is used to heat or cool products. This includes dryers, ovens, pollution control, boilers, tanks and similar energy users. Another energy user is a plant's air heating and cooling (HVAC) system.*

MEGTEC's experience in air handling, drying, heating, cooling, process control and combustion improves the operating efficiency of your facility and helps to maximize the performance of your equipment.

### MEGTEC can help optimize your plant process efficiency

- **Enhanced capacity and efficiency.** MEGTEC analyzes your current process energy usage and recommends ways to reduce consumption. MEGTEC engineering studies provide the vital information you need to make the best decisions on process upgrades and equipment selection in order to most efficiently use energy in your process.

### MEGTEC supplies custom-designed systems that can help reduce energy costs

- **Plant and process heating and cooling.** MEGTEC can provide highly efficient heat sources – direct, indirect, or semi-indirect, heater boxes or plenums to satisfy your process heating needs. Steam or hot/chilled water can be supplied through the addition of waste heat boilers or adsorption chillers. In areas where building heat is required, water/glycol systems can be installed to capture heat from the process exhaust and recover for use as building heat.
- **Process heat recovery.** Heat recovery systems are becoming very popular as a means of lowering operating energy costs. Heat recovery through the use of air-to-air heat exchangers or air-to-thermal fluid systems can be added to equipment in order to capture heat. Energy recovered can be used for building heat or to improve the thermal efficiency of the process.

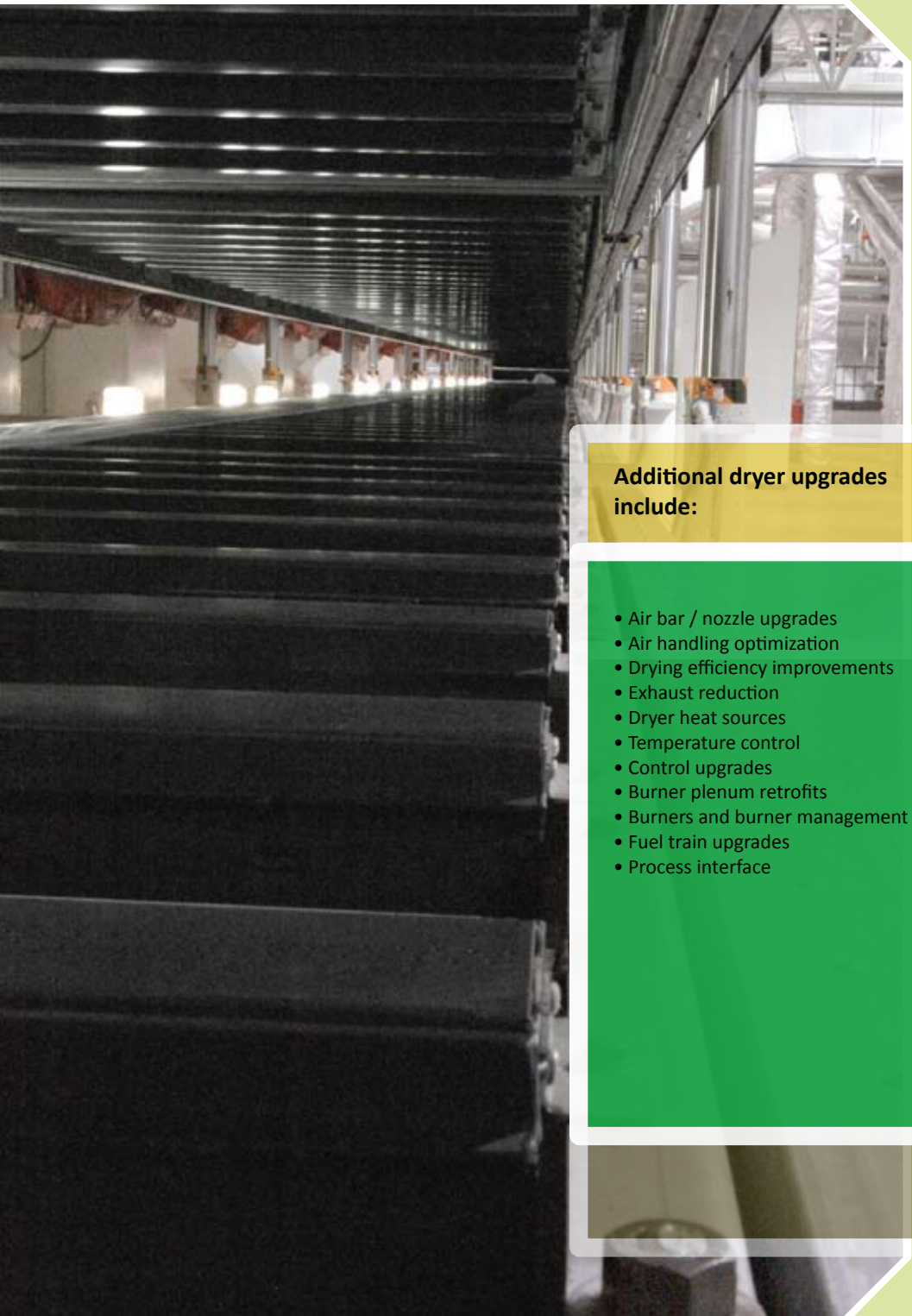
## Optimization for Dryers and Ovens

MEGTEC engineers can analyze dryer or oven operation and recommend ways to save energy.

Our energy experts identify drying process opportunities and evaluate and recommend performance improvements that will save energy and improve efficiency and production.

### Some of the typical projects that improve energy consumption:

- **Heat recovery.** With the use of air-to-air heat exchangers, thermal fluid systems or steam systems, waste heat from the dryer or oven can be recovered, returned and re-used in the process itself, or to pre-heat building make-up air.
- **Preventive maintenance.** Equipment that is routinely maintained uses less energy. MEGTEC's Preventive Maintenance program (PM) includes checking equipment for proper settings and balances of fans and dampers – a process that helps reduce your gas and electric costs. In addition, replacement of cracked or missing gaskets or flex ducts will improve the efficiency and performance of your dryer or oven.
- **Web transportation and drying.** Often a change in product or coating substrate or misapplied equipment can prove inefficient. MEGTEC can recommend the optimum dryer configuration and operating parameters through modeling and in-house pilot line trials.
- **Retrofits**
  - **Humidity control.** As is often required with water-based coating applications, you may need to control your exhaust rate. MEGTEC offers a closed-loop AC drive, or automatic damper control for energy savings.
  - **LFL.** With solvent-based systems, we offer a closed-loop system to control LFL, controlling exhaust flows using only the air required to safely dry or cure products.
  - **VFD.** A Variable Frequency Drive (VFD) can reduce energy costs. It is used to automatically ramp a fan or pump motor up or down to suit variations in the process conditions and optimize electrical energy consumption.



**Additional dryer upgrades include:**

- Air bar / nozzle upgrades
- Air handling optimization
- Drying efficiency improvements
- Exhaust reduction
- Dryer heat sources
- Temperature control
- Control upgrades
- Burner plenum retrofits
- Burners and burner management
- Fuel train upgrades
- Process interface

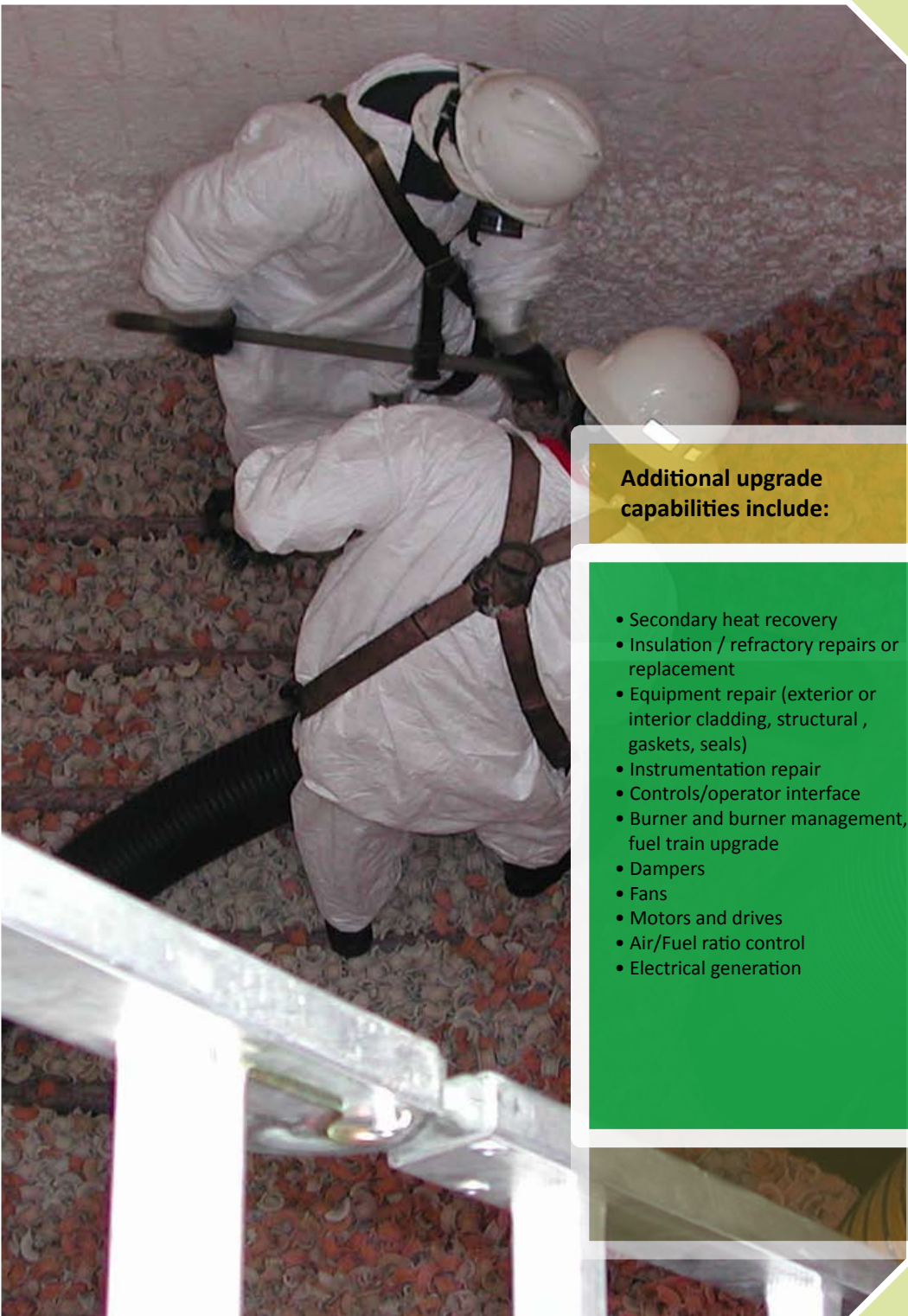
## Oxidation System Energy Reduction

MEGTEC can upgrade your oxidizer to optimize its efficiency and performance, resulting in energy savings.

By upgrading older catalytic oxidizers, thermal recuperative or regenerative thermal oxidizers (RTOs) or direct-fired oxidizers, MEGTEC can help increase capacity and reduce operating costs.

- **Media replacements.** The pressure drop associated with random-packed heat exchange media used in certain RTOs is very high when compared to today's structured media. By replacing the random-packed media with structured, the pressure drop across the unit is reduced, helping air pass through the oxidizer more efficiently. This impacts energy usage by reducing operating costs.
  - **Electrical costs.** Lowering the pressure drop across the oxidizer allows the exhaust fan to operate at a lower brake horsepower, resulting in reduced electrical costs.
  - **Capacity improvement.** Improved through-put can be realized by replacing random-packed ceramic media with structured, while at the same time, maintaining VOC destruction and increasing efficiency.
- **Heat exchanger replacements.** MEGTEC can replace older, inefficient heat exchangers with units manufactured of custom metals to meet your requirements. Configurations include: plate type or shell and tube.
- **Preventive maintenance (PM).** Whether your oxidizer is MEGTEC-manufactured or another brand, MEGTEC's PM program can help to reduce energy usage. As part of the PM program, experienced MEGTEC representatives recommend replacement of worn or obsolete parts with replacement parts and upgrades that can keep your equipment operating at peak efficiency.

PM capabilities such as the use of a thermal imaging (IR) camera provides infrared scans to help identify potential problems to avoid unplanned downtime.



**Additional upgrade capabilities include:**

- Secondary heat recovery
- Insulation / refractory repairs or replacement
- Equipment repair (exterior or interior cladding, structural , gaskets, seals)
- Instrumentation repair
- Controls/operator interface
- Burner and burner management, fuel train upgrade
- Dampers
- Fans
- Motors and drives
- Air/Fuel ratio control
- Electrical generation

## Heat Recovery Systems

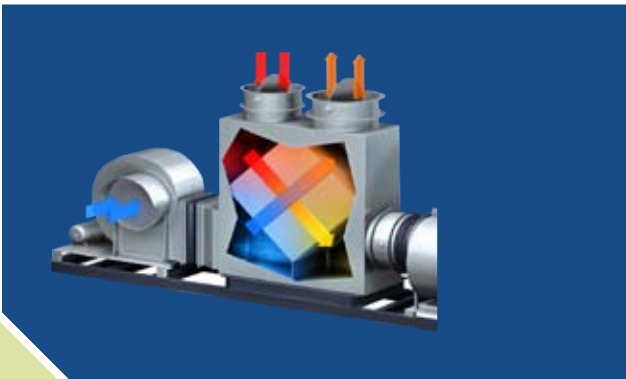
MEGTEC's experience in providing heat recovery systems to facilities around the world proves our expertise. MEGTEC engineers have an in-depth understanding of the customer's process, and can provide a system to recover excess energy in the exhaust stream direct from the process or oxidizer.

The key to effective energy recovery is to identify the optimum sources of and uses for the energy and select the most cost-effective, efficient system to transport and deliver the energy.

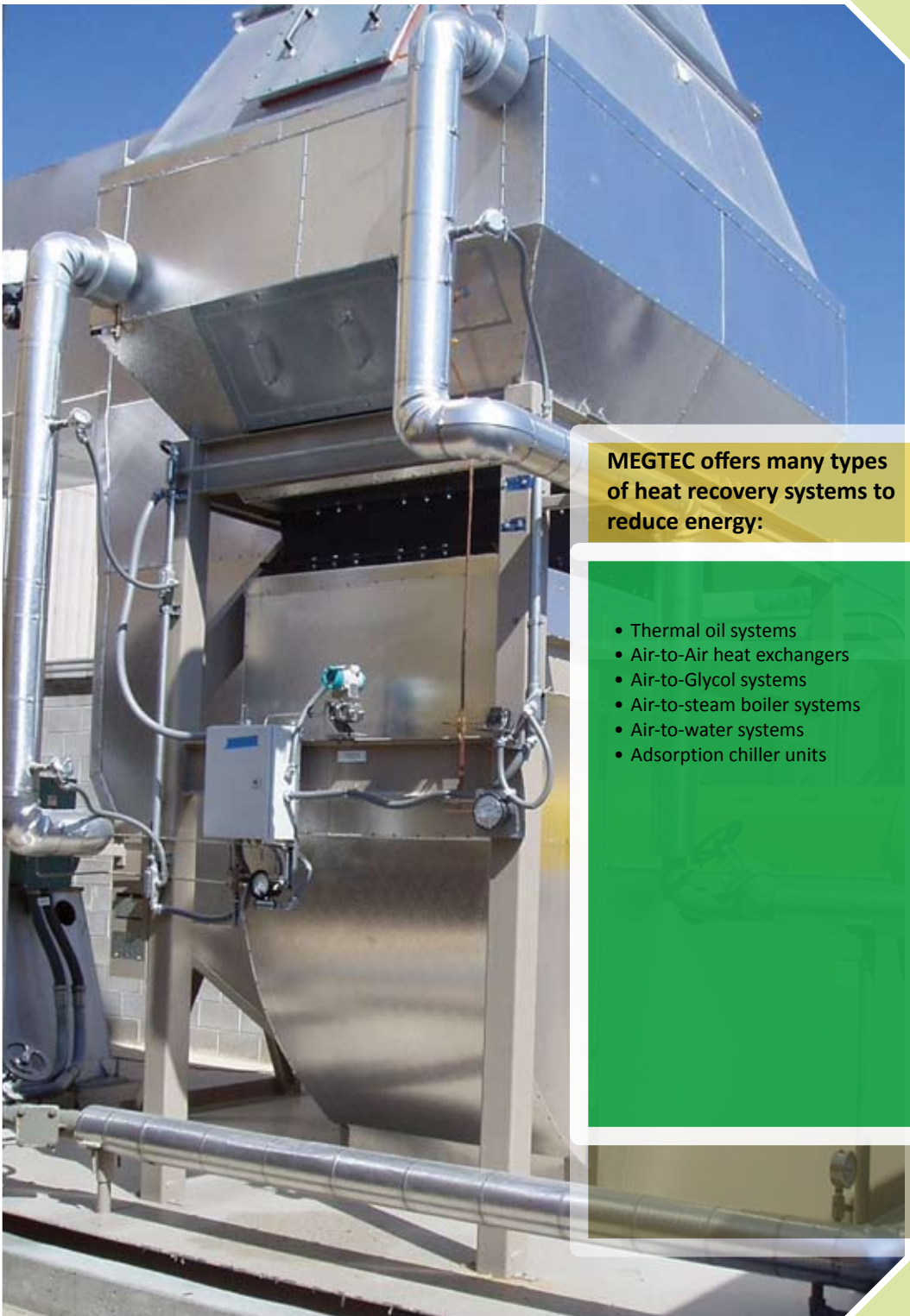
Uses for recovered energy include:

- Combustion air heating
- Process makeup air systems
- Building makeup air heating systems
- Hot water systems (plant boiler loop)
- Low temperature steam applications
- Dryer air curtain systems

Whether your needs require a custom designed and built heat recovery system, or a "prepackaged" system, MEGTEC can offer you a wide range of solutions to fit your energy re-use needs. MEGTEC's robust, skid-mounted heat recovery system is provided fully assembled and tested. Its small footprint provides an attractive return on your investment, yet is fully automated for efficient operation.



Skid-mounted process heat recovery system with air-to-air heat exchanger



**MEGTEC offers many types of heat recovery systems to reduce energy:**

- Thermal oil systems
- Air-to-Air heat exchangers
- Air-to-Glycol systems
- Air-to-steam boiler systems
- Air-to-water systems
- Adsorption chiller units

## Solvent Recovery System Energy Reduction

MEGTEC offers unparalleled experience in supplying solvent recovery systems with hundreds of units installed worldwide. We understand your process requirements, and we have the knowledge to evaluate your system and identify ways to save energy.

**Heat recovery.** MEGTEC's Solvent Recovery Systems can be supplied or retro-fitted with a heat recovery system, comprised of a shell and tube heat exchanger system, utilizing the sensible heat of the steam and solvent desorbate to pre-heat boiler feed or utility water for building heating systems--effectively reducing energy costs.

**Exhaust gas analyzer systems.** An exhaust gas analyzer system to monitor the exhaust stack emissions from the solvent recovery system can be retro-fitted. The exhaust gas analyzer is tied into the solvent recovery control system and is designed to automatically initiate the steam regeneration cycle once a preset emission limit has been reached. The gas analyzer ensures that the adsorptive capacity of the solvent recovery system is maximized before a steam regeneration cycle is initiated reducing overall steam consumption and energy costs.

**Variable frequency drives.** A Variable Frequency Drive (VFD) can reduce energy costs. It is used to automatically ramp a fan or pump motor up or down to suite variations in the process conditions to optimize electrical energy consumption.

**Steam economization.** By adding an exhaust hydrocarbon analyzer, steam consumption of activated carbon adsorption systems can be reduced by initiating steam regeneration cycles based on carbon saturation levels, not timed cycles.

**Replacement Carbon and Carbon Service.** Over time, carbon can become less efficient through contamination, poisoning or attrition. This can impact carbon performance and can lead to excess steam usage and higher energy costs. To combat this, MEGTEC offers a range of services including: carbon sample testing, carbon screening services and replacement carbon.

**Energy audit and system surveys.** MEGTEC can offer energy audits and system surveys to evaluate the performance of your solvent recovery system to ensure that it is operating efficiently and to identify energy saving opportunities.

