

Issues in Distributed Generation in Louisiana
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Save Energy Now Workshop:
Convert Industrial Wastes to On-Site Heat and Power

Wednesday, January 30, 2008
New Orleans, LA

YOU HAVE HEARD:

That opportunity fuels are available and their economics.
How hard it is to use opportunity fuels.
And what events might make self generated power desirable.

How much does “fuel cost” effect the economics of a plant?
Why would/should Industry care about opportunity fuels?

Opportunity Fuels/CHP Business Drivers

Reliability

Economics

Sustainability

Reliability

Needs / Values

- ↑ Power or thermal reliability
- ↑ Redundancy
- ↑ Outage Longevity
- ↑ Grid Independence
- ↑ Restart Flexibility
- ↓ Quality Interruptions
- ↑ Fuel Flexibility
- Cost of lost operations
- Cost of lost assets
- Improved Safety
- Improved Security
- Reduced foreign energy dependence

Economics

Needs / Values

- ↓ Operating Expense
- ↓ Tax
- ↑ Productivity
- CHP Generates Significant Energy Savings
- Tax Incentives & rebates
- 3rd Party Financing possible
- Emissions trading

Sustainability

Needs / Values

- GHG Reductions/Significantly Reduces Emissions
 - PM, NOx, SOx, Carbon

- Permit Solution for Non-attainment
- Green Building /Sustainable Design:
 - LEED Points (up to 10)
 - Green Guide for Health Care (GGHC) points
- Efficiency - Good Public Policy:
 - GREEN publicity
 - Community Support
- Resource Preservation coupled with Renewable Resources
- Improve Community Relations

CHP < NOx than stand-by Generators

What does Louisiana offer industry that invests in distributed generation?

Industrial:

Machinery and Equipment Sales Tax Exemption for Cogeneration--Machinery and equipment used by an industrial manufacturing plant to generate electric power for self consumption or cogeneration.

Sales Tax Exemption for Alternative Fuels—state or local sales and use taxes shall not include the sale of any alternative substance when used as a fuel by a manufacturer.

"Alternative substance" means any substance other than any product of oil, natural gas, coal, lignite, refinery gas, nuclear fuel, or electricity. "'Alternative substance" shall include petroleum coke, landfill gas, reclaimed or waste oil, unblended biodiesel, or tire-derived fuel."

NOTE: Subparagraph (z) as enacted by Acts 2005, No. 345, §1, expires on **June 30, 2012**.
(Reference [La. R.S. 47:301](#))

Air Permitting per Dept. of Environmental Quality

An air permit must be secured before construction can commence unless the facility is exempt under Act 918.

LDEQ presumes that most CHP installations at institutional facilities will be minor sources.

Timing Considerations:

Minor Source:

- A final decision on a permit application should take ~ 3 months.
- Public notice not required unless operational restrictions (e.g., limiting fuel use or operating time) are necessary to maintain minor source status, then a 30-day public comment period will be required.

Major Source:

- A final decision on a permit application should take ~ 5-6 months.

- 30-day public comment period and 45-day EPA review period are mandatory.

Expedited Permit Processing

The Expedited Permit Processing Program allows interested applicants to reimburse LDEQ for overtime costs incurred by employees that work to expedite a permit, modification, license, registration, or variance.

- Over 200 requests received in just the first year of the program.
- Well-received and enthusiastically supported by industry.
- Dept. of Economic Development touts as helpful to industrial growth.

Expedited Permit Processing (cont.)

Send no money now!

Invoices for expedited fees will be sent to the applicant after a decision has been made to grant or deny the permit action.

- The fee shall not exceed the maximum per hour overtime salary, including benefits, of the civil service employee who performs the work.
- The final amount is based on the actual number of overtime hours the employee works processing the expedited permit.
- No net revenue to the State is generated.

Expedited Permit Processing (cont.)

When an applicant requests consideration for expedited processing, a brief “Request for Expedited Permit Processing” form must be submitted to the department. No fee is associated with this form.

Expedited Permit Processing is an exercise of the administrative authority’s discretion and subject to availability of resources.

Expedited Permit Processing (cont.)

The applicant may request the expedited fee not exceed a maximum amount. In which case overtime hours will be limited accordingly and if further processing is required, it will be processed per normal procedures. Non-expedited permit applications will continue to be per normal procedures during normal business hours.

Participation in the expedited permit processing program will have no bearing on an application’s assigned priority (i.e., increase its priority).

New Permits Procedures Manual

LDEQ is preparing an updated and revised "Louisiana Guidance for Air Permitting Actions" which should be available now

- This edition provides a more basic overview of air permitting procedures.
- New material added, majority of material contained in the previous versions retained (though perhaps rearranged).

CHP and Air Quality Permitting

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What does the federal government offer industry that does distributed generation?

Modified Accelerated Cost-Recovery System (MACRS)

Incentive Type: Corporate Depreciation

Eligible Technologies: Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Wind, Geothermal Electric, Fuel Cells, Solar Hybrid Lighting, Direct Use Geothermal, Microturbines

Applicable Sectors: Commercial, Industrial

Authority 1: [26 USC § 168 \(2005\)](#) **Authority 2:** EPA Act 2005

Summary: Under MACRS, businesses can recover investments in certain property through depreciation deductions. The MACRS establishes a set of class lives for various types of property over which the property may be depreciated. For solar, wind and geothermal property the current MACRS property class is five years. The Energy Policy Act of 2005 added fuel cells, microturbines, and solar hybrid lighting technologies as well.

For more information, see *IRS Publication 946, IRS Form 4562: Depreciation and Amortization, and Instructions for Form 4562*.

Business Energy Tax Credit-- Commercial, Industrial Corporate Tax Credit

Eligible Technologies: Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Geothermal Electric, Fuel Cells, Solar Hybrid Lighting, Direct Use Geothermal, Microturbines

Amount: For equipment placed in service from January 1, 2006 until December 31, 2008, the credit is 30% for solar, solar hybrid lighting, and fuel cells, and 10% for microturbines. Geothermal credit is 10%.

Maximum Incentive: \$1000 per kW for fuel cells; \$200 per kW for microturbines; no maximum specified for other technologies

Eligible System Size: Microturbines less than 2 MW; fuel cells at least 0.5 kW

Authority 1: [26 USC § 48](#)

Authority 2: IRS Form 3468 (Tax Year 2006)

Summary: The provisions of the tax credit were extended through December 31, 2008, by Section 207 of the [Tax Relief and Health Care Act of 2006 \(H.R. 6111\)](#). After January 1, 2009, the tax credit for solar energy property and solar hybrid lighting reverts to 10% and expires for fuel cells and microturbines. The geothermal credit remains unchanged at 10%. (does not

include geothermal heat pumps.) Energy property does not include public utility property, passive solar systems, or pool heating equipment. The equipment must be operational in the year in which the credit is first taken. The basis on which the credit is calculated must be reduced by any subsidized energy financing or by tax-exempt private activity bonds.

U.S. Department of Energy (DOE)

Save Energy Now assessments focus on energy-intensive systems: process heating, steam, compressed air, fans, and pumps. Fine-tuning of these systems could offer large savings. Optimizing these systems can lead to significant long-term savings.

Through **Save Energy Now**, DOE offers these energy assessment options:

- **For large plants:** The largest, most energy-intensive plants can apply to receive a 3-day on-site assessments are led by DOE's [Energy Experts](#) using DOE's software tools and technical information to target a specific system area. Provides hands-on learning for your staff to gain knowledge of the benefits of the assessment.
- **For small and medium-sized plants:** DOE's university-based [Industrial Assessment Centers](#) conduct 1-day assessments at smaller plants. Teams of highly trained IAC faculty and engineering students apply the same DOE software tools and technical resources to identify key savings opportunities throughout your plant.

See Dr. Ted Kozman for more information

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Distributed Energy Technologies

The DOE **Distributed Energy Program** supports cost-effective research and development aimed at lowering costs, reducing emissions, and improving reliability and performance to expand opportunities for the installation of distributed energy equipment today and in the future.

Advanced, natural gas-fired Reciprocating Engine

The DOE is developing advanced, natural gas-fired reciprocating engine systems for distributed energy (DE) applications in industrial, commercial, and utility settings. The mission of the program is to lead a national effort to design, develop, test, and demonstrate a new generation of reciprocating engine systems that are cleaner, more affordable, more reliable, and more efficient than products commercially available today.

At present, [distributed energy equipment](#) and [thermally-activated equipment](#) must be customized in a CHP system at each building site. This translates into loss of overall efficiency and higher capital costs from on-site engineering. **Integrated Energy Systems (IES)** combine on-site power or distributed generation technologies with thermally activated technologies to provide cooling, heating, humidity control, energy storage and/or other process functions using heat normally wasted in the production of electricity/power.

Seven teams of U.S. companies are currently working in partnership with the Department of Energy on the development of modular packaged integrated energy systems to reduce total system costs, improve overall energy efficiency, and reduce operating and maintenance costs. Designing plug-and-play systems for CHP is critical to reducing the time and effort required to integrate system components. Link below will take you to the descriptions.

Projects: http://www.eere.energy.gov/de/chp/chp_technologies/projects.html

Thermally Activated Technologies

DOE has worked with industry to develop on-site energy conversion technologies, often classified as thermally activated technologies (TAT), for energy and economic purposes.

TAT optimizes energy delivery systems by using non-electric devices to displace electric devices when the electric distribution system is at peak demand. Air conditioning and refrigeration drive U.S. electricity peak demand; TAT such as absorption cooling/refrigeration and desiccant dehumidification can reduce this demand peak.

TAT can also improve the efficiency of distributed generation systems. For example, if a distributed generator produces electricity for \$0.07/kWh when operating alone, the same distributed generator in cooling, heating, and power (CHP) mode will, by recycling thermal energy, yield a system production cost of \$0.057/kWh or less.

Power interruptions across the United States in recent years have increased the need for near-term solutions for localized electric grid support systems and demand reduction. Long-term economic growth requires a reliable power supply, and CHP systems utilizing TAT equipment can fill this need.

Recycling Thermal Energy – Waste Heat to energy

In the year 2020, 5% of all energy consumed in the United States will be recycled thermal energy.

- Thermal energy recycling is the largest opportunity for reducing energy consumption.
- Accelerate the development of desiccant ventilation air technologies.
- Leapfrog materials, design, and control technologies are essential elements of this accelerated research, testing, and verification roadmap.

Projects

Lithium Bromide Chiller

Desiccants

Heat Pumps: The **GAX** heat pump is up to 40% more efficient in heating than existing technologies, requires less maintenance, and uses environmentally friendly refrigerants.

The **Hi-Cool** absorption heat pumps are being developed specifically for improved cooling performance in southern climates. It will offer energy efficiencies 30% or more better than current absorption technologies.

Advanced Thermal Recovery Cycles

Heat and Mass Transfer Based Technology

Information Resources:

Gas-fired Reciprocating Engines:

http://www.eere.energy.gov/de/gas_fired/information_resources.html

Thermally Activated Technologies:

http://www.eere.energy.gov/de/thermally_activated/information_resources.html

Distributed Energy Information Resources:

Gas-fired Reciprocating

Engines:<http://www.eere.energy.gov/de/gas_fired/information_resources.html>

http://www.eere.energy.gov/de/gas_fired/information_resources.html

Thermally Activated

Technologies<http://www.eere.energy.gov/de/thermally_activated/information_resources.html>:

http://www.eere.energy.gov/de/thermally_activated/information_resources.html

CHP

Technologies<http://www.eere.energy.gov/de/chp/chp_technologies/information_resources.html>

http://www.eere.energy.gov/de/chp/chp_technologies/information_resources.html

Gulf Coast CHP Application Center<<http://www.gulfcoastchp.org/About/>>

<http://www.gulfcoastchp.org/Default>