

**The Building Owners Guide for Tax and Energy Savings**

**Engineering White Paper**

Subject :

How the building owner can take advantage of House Bill 1331-6 / Energy Policy Act of 2005 ( EAct 2005) tax deductions for installing energy savings HVAC equipment.

Overview:

This "white paper abstract" will address how House Bill 1331-6 can allow the Federal Government to become a partner in saving energy in industry and distribution facilities.

What a Building Owner needs to Know about House Bill 1331-6

House bill 1331-6 was signed into law on August 8<sup>th</sup>, 2005, and is a federal law which originally extended through 12/31/07 but has been extended through 12/31/08.

This law allows a corporation to take a federal tax deduction for taking specific steps to reduce energy usage in a building if there is a proper certification of the project which includes a detailed engineering study and computer modeling report. For this reason, we recommend that any company investigating applying for an "energy tax deduction" contracts with a professional consulting engineering firm with experience in dealing with the Department of Energy and that has computer modeling certified capability.

The engineering certification report/study must be completed in the same tax year as the project is implemented.

To qualify for the "House Bill 1331-6 tax deduction" the building owner must have an engineer, familiar with building energy simulations, certify that they either reduced energy used by 16 2/3% on lighting, HVAC and building envelope, or by 50% in any of the combined three areas: lighting, HVAC and/or building envelope. The building owner can claim a \$.60/sq.ft.each for lighting, HVAC and building envelope, or up to a \$1.80/sq.ft.if 50% cost reduction involving all three areas results.

There has been a widespread interest in the "House Bill 1331-6 Energy Act Bill" but it has created confusion as to how the savings are to be determined. In a renovation of an existing building, the tax savings are not based on what actual energy savings occur from replacing the original lighting, heating or building envelop system; but rather as compared to "the Standard Building as detailed in ASHRAE 90.1 (2001). This important clarification is another reason why the building owner should contract a professional engineering firm, familiar with this program, to review and certify the project. Performing energy upgrades, and expecting a tax deduction that is not realized or "rejected by IRS" in a later year could become a missed opportunity if not done in a timely fashion and certified by the energy engineer.

### Case Study

A 650,000 sq. ft distribution warehouse is being designed for Kansas City, Kansas. The building is 40' tall and will be used as a distribution of dry goods.

The customer's required conditions will require 60 degrees on a winter design day (0 degree F) and there will be no air conditioning.

The primary fuel available will be natural gas. The cost of gas will be projected as being \$1.25/therm and the cost of electricity will be \$.065/KW including demand charges.

#### Equipment Selected:

For the sake of this "case study" a CFD report was generated that showed by using a direct fired rooftop make-up air system with 80/20 louvers and controls the building could be held at 60 degrees on a "winter design day".

The make-up air unit manufacturer warranted that their system would hold the space at 60 degrees by making use of a special revolving discharge on the make-up air units and a patented "Energy Mizer" control system that included 5 energy savings steps through an integrated DDC control system.

Standard heating systems had not made the 50% savings levels in the computer models or CFD developed.

What does the consulting engineer do on this project?

The consulting engineer first does a tertiary review of the project to see if it appears to meet the benchmarks of House bill 1331-6.

If it meets the basic criteria as a "viable candidate" the engineer will do two detailed computer simulation models. The first would be of the base building utilizing the heating systems that comply with House bill 1331-6 and the second simulation would be of the proposed heating system utilized. The energy usage of these two systems would be compared and from that comparison the report would qualify or dis-qualify the project for the 16 2/3% or the 50% limit.

The consulting engineer must then complete the *Consultant's Letter of Project Overview*, the *Certificate of Compliance*, and provide the savings documentation. The savings documentation includes a description of the energy conservation measure(s) being considered, with the computer printout simulating the benefits of the proposed measure. This package of information is then used by the building owner to present to his accounting firm to file for the tax deduction.

Case Study Results: (Heating only)

By utilizing the consulting engineer's work, the building owner made a tax deduction claim for \$390,000.00 based on \$.60/sq.ft.

The net deduction from the tax deduction is projected to be \$117,000.00 to the building owner based on using a 30% federal tax bracket.

Need for a Professional Accounting Firm

The building owner initiates the process of obtaining his tax deductions by using the services of a professional familiar with his building plan, the sophisticated techniques of building computer simulation, and procedures necessary for quantifying and documenting the tax benefits provided by EPAct 2005. The findings, which includes the *Consultant's Letter of Project Overview*, the *Certificate of Compliance*, and savings documentation, are then communicated to the other member of his team: the building owner's accounting firm. He then uses this information to process the tax deduction as part of his preparing the owners annual tax documents.

## Green Tint Buildings

A typical distribution building will have two main utility bills, one for electricity and one for heating. If the building is air conditioned, the facility will have a much larger annual electric bill.

Electric bills for the traditional lighting systems would be \$.43/sq.ft. (See computations below.)

Gas bills for the traditional heating of this size structure would be \$178,750.00 or \$.275 per square foot.

Combined, an owner could project energy costs for lighting and heating to average between \$.705/sq.ft. and \$.79/sq.ft.

If a building owner can reduce the total energy usage in a distribution warehouse building from \$.747/sq.ft. (average of above combined energy cost ranges) to \$.40/sq.ft. The owner can consider the building qualifying for "Green Tint" designation and can gain "LEED Points" for an "EB" existing building.

In this case study the owner could claim a combined tax deduction under House Bill 1331-6 for both the heating and the lighting in the amount of \$780,000.00 . The actual tax deduction will be the difference lower value of the tax deduction claimed (\$780,000.00) and the actual cost for the heating and lighting systems. (See question #4 in the following section of this paper.)

More importantly, the owner can operate the same building at a \$227,500.00 energy savings annually. This pays dividends every year for the life of the building.

In the case of a 650,000 square foot distribution building an estimate for typical energy usages based on older style metal halide lights and natural gas unit heaters would be as follows:

### Assumptions:

Hours of annual operation: 5700 hours annually  
118 hours per week

Cost per therm : \$1.25/therm

Cost per kilowatt : \$.065/kw

Lighting:

400/sq/ft per light (650,000/400 sq. ft = 1625 lights)

1625 lights @ 400 watts each (464 with ballasts)

= 754,000 watts/hr x 5700 hours = 4,297,800,000 watts/year  
= 4,297,800 kw/year

4,297,000 kw x \$.065/kw = \$279,357.00 /year

This would be the equivalent of \$42.97/sq.ft per year

The use of T-5 lighting with the same fixtures would offer an annual savings of 50% resulting in an annual operating cost of \$ \$139,678.50 and an annual operating savings exclusive of any tax savings of \$139,678.50.

Heating: The heating costs have been taken from published performance data and the manufacturer's operating cost calculations.

**Summary:**

House bill 1331-6 may become the most far reaching Federal Tax incentive for American industry to save energy but it must be studied and understood prior to any successful implementation.

Background Information:

This section of the paper addresses five frequently asked questions:

1. What is and how does House Bill 1331-6 affect a corporation when a new HVAC system is installed?
2. What qualifies a corporation for a tax deduction under this new law?
3. What steps must be taken from an engineering perspective to certify and claim such a tax deduction?
4. What are the limits on this tax deduction?
5. Why is a Professional Engineer required?

What is and how does House Bill 1331-6 affect a corporation when a new lighting system is installed?

House bill 1331-6 is a wide reaching bill that primarily promotes energy efficiency in our commercial and industrial facilities. To qualify for the deduction the building owner must have taken specific steps to both qualify and certify the process.

What qualifies a corporation for a tax deduction under this new law?

The three main areas in which the House Bill 1331-6 can be applied to qualify for a tax deduction are lighting, heating and ventilation, and building envelope.

A project that replaces or modifies existing lighting or HVAC systems to reach a 50% reduction of energy usage as compared to an ASHRAE 90.1 base design building may qualify but must meet the criteria detailed in the house bill.

What steps must be taken from an engineering basis to certify and claim such a tax deduction?

As stated in the above paper, we recommend that a building owner hire a professional consulting engineer to review the overall project prior to expenditure of funding and to develop the following:

- A. Utilizing an authorized computer modeling program the structure must be compared to an ASHRAE 90.1 base design building to establish whether or not the benchmark energy savings detailed in House Bill 1331-6 are achieved.
- B. "Certificate of Compliance" supplied by the Federal Government that is properly completed and signed by the professional engineer.
- C. A letter detailing the scope of the project with attachments that support the expenditure and project costing.

The process of qualifying a particular project is an engineering function that is based on studying the owner's building specifications and comparing them to both a "base design building" as well as to the system that is being suggested for the owner's building.

What are the limits on this tax deduction?

The tax deduction may not exceed the total cost of the project.

The project must qualify in the areas detailed in the House Bill.

Why should a consulting engineering firm be involved in this process?

This is a technical process that requires a technical approach. The development of a computerized modeling program and the actual certification must be done by a professional entity to quantify the expected savings in an objective manner.

Additionally, the Engineer brings to the project an impartial view of what options are available to the client for improving his building operating costs. It would be a missed opportunity for a company to expend the funds to upgrade their equipment or systems, and then find the savings doesn't meet their expectations. To find out a significant deduction was not obtained due to lack of knowledge about the EPAct 2005 program, or due to improper documentation of the project, would be doubly costly.

If you have questions or comments, or wish to obtain more information please address them to:

Mr. E. W. Bob Boulware, P.E., M.B.A.  
Design Aire Engineering, Inc.  
A Professional Engineering Firm  
Indianapolis, Indiana 46202-3702  
Phone 317-694-9090 / Fax 317-464-9393 / Toll Free 866-15-9090  
Website: [www.design-aire.com](http://www.design-aire.com) Email [bboulware@design-aire.com](mailto:bboulware@design-aire.com)

---

Mr. Boulware is Founder and President of Design-Aire Engineering, a mechanical / electrical / energy consulting engineering firm since 1983 in Indianapolis, Indiana. Design-Aire is actively involved with providing engineering services nationally and has completed projects in the Caribbean and Russian Far East. He is a graduate engineer from Purdue University and has a Masters in Business Administration from Indiana University.



Professional Disclaimer:

This paper has been composed for the exclusive use of Design Aire Engineering (DAE) and its clients and is not to be copied, duplicated or quoted from without written permission of DAE.

This paper and the contents are the results of an investment of time and effort and is considered the exclusive intellectual property of Design Aire Engineering, Inc., Indianapolis, Indiana.

Design Aire will not take responsibility for the application of this paper or the tax deductibility of any project for which DAE has not done the engineering.