

FINAL
November 14, 2005
Tax Incentives Assistance Project
Commercial Buildings Subcommittee

Recommendations to the Departments of Energy and Treasury for
Implementation of the Commercial Buildings Tax Deductions in the Energy Policy Act of 2005

Introduction

The Tax incentives Assistance Project (TIAP) was organized in the fall of 2003 for several purposes including to provide policy and technical recommendations to the Departments of Energy and Treasury for implementation of specific tax incentives for new and existing homes, commercial buildings, vehicles and other products included in various versions of federal energy legislation. In August of 2005, the energy bill was enacted and signed into law as the Energy Policy Act of 2005 (EPAct 2005.)

The purpose and scope of this paper is to provide TIAP recommendations for implementation of the commercial buildings tax deductions set forth in Section 1331 of Subtitle C, Conservation and Energy Efficiency Provisions, in EPAct 2005. The full text of this section can be found in Attachment 1.

TIAP is a joint voluntary effort among parties interested in maximizing the impact of the energy efficiency tax incentives included in the comprehensive EPAct 2005. A fact sheet on TIAP's mission can be found in Attachment 2. TIAP's specific goals regarding energy efficiency are as follows:

- a. To maximize net energy savings achieved under the tax incentives and to extend these savings to all regions of the country.
- b. To use the tax incentives to best leverage long-term market changes so that in the future, efficient products and practices are normal practice, even after the tax incentives end.
- c. To build positive relationships between traditionally opposed organizations that now share interest in promoting the tax incentives, with the intent of those relationships continuing even after the tax incentives end.

TIAP is governed by a Steering Committee that was selected by volunteers from among the more than two dozen organizations involved in forming TIAP. The following organizations make up the Steering Committee: Alliance to Save Energy, American Council for an Energy Efficient Economy, California Energy Commission, Energy Foundation, Environmental Protection Agency, National Electrical Manufacturers Association, Natural Resources Defense Council, New York State Energy Research and Development Authority, and the Residential Energy Services Network.

These and other organizations have contributed to these recommendations, including members of the NEMA Commercial Buildings Tax Deduction Coalition with whom we have closely coordinated.

Summary of Recommendations

The TIAP Commercial Buildings Subcommittee offers recommendations for implementation of the commercial tax deductions in the areas shown in the table below. Each of these is described in more detail in the remainder of this paper.

Table 1 - TIAP Commercial Tax Deduction Recommendations

Topic Area	Recommendation Summary
Energy cost savings target	Determined only with respect to the sum of the costs for interior lighting systems, heating, cooling, ventilation and hot water systems as per the specific requirements of the legislation. Does not apply to total building energy costs or non-ASHRAE end-uses
Partial deductions for mechanical, lighting and envelope systems	Partial energy cost reduction targets should be proportional to the building subsystem’s contribution to these costs. “Custom” targets should be set for each building through an ACM-based energy simulation of the ASHRAE-compliant reference building. A straight one-third allocation of the 50 percent whole building target to each of the three building subsystems is technically inappropriate.
Energy analysis software certification	Adopt the proposed TIAP energy analysis software certification rules presented in Appendix 1. Issue these rules by January 1, 2005, or earlier to ensure that software developers can bring software to the marketplace in a timely manner.
Certifications	Two certifications are needed. First, an <i>energy analyst</i> needs to certify that a design meets the savings levels specified in the law. This analyst needs to provide a list of key equipment and other building measures that are needed to provide these savings. Second, a <i>verification inspector</i> needs to inspect the building as built to verify that key equipment and measures are installed and placed in service.
Certification of energy analysts	On an interim basis, do not require formal certification of energy analysts due to lack of existing certification programs. For 2006, require licensed design professional or Certified Energy Manager with documented knowledge and experience of building energy simulation, to sign off on energy analysis and other requirements. A signed statement of knowledge and experience (see Appendix 2) is to be retained with the project records for audit purposes. Work with interested parties to develop a certification program for 2007.
Certification of verification inspectors	On an interim basis for 2006, do not require certification of verification inspectors. The verification inspector should be independent of the building owner, the building designer, or the construction contractor. An independent Energy Analyst should be permitted to perform both the energy analysis and the inspections. A building commissioning agent, if used on the project, should be permitted to perform the required inspections as part of their normal commissioning activity.
Notice to Owner	Provide guidelines and specifications for information to be included on the Notice to Owner. Allow private sector software developers, energy analysts and building design professionals decide on its format.
Person eligible for deduction for public	In the case of public buildings, the person eligible for the tax incentive shall be designated by the agency owning the building. Specific

buildings	recommendations on wording are provided below.
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The intent of these recommendations is to provide practical solutions to technical issues that will reduce barriers to broad participation in the commercial building tax deductions, while maintaining sufficient technical integrity to ensure that the expected energy savings are incorporated into the building design.

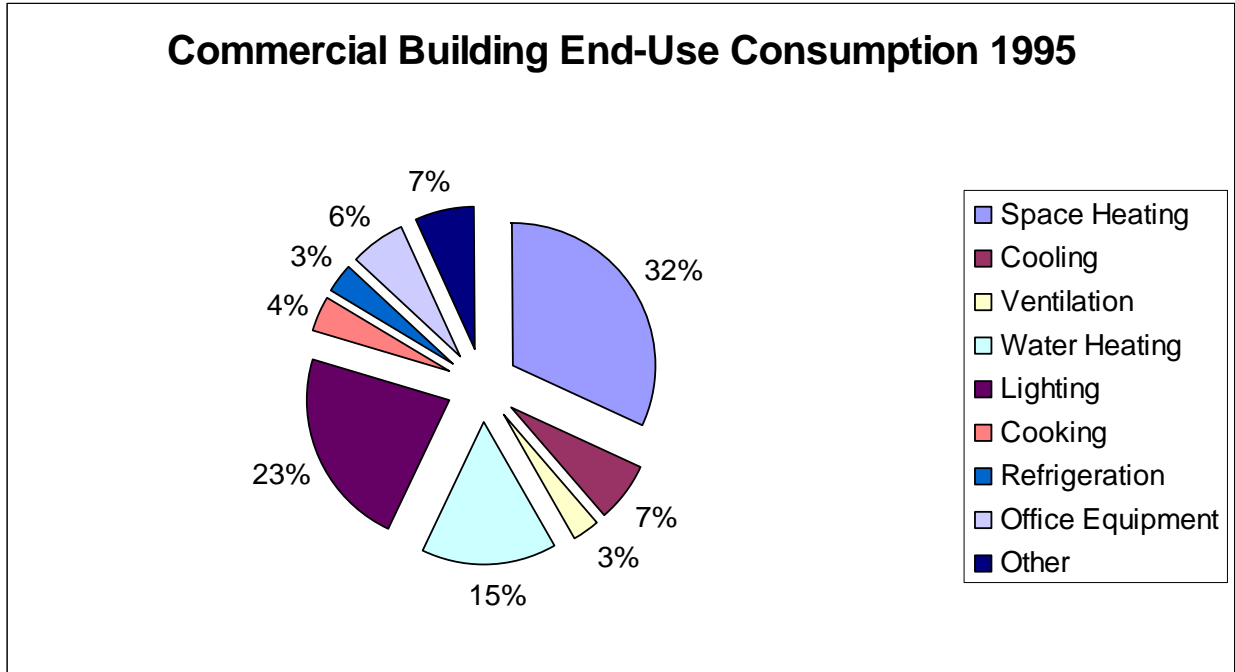
Technical Discussion of Recommendations

Energy cost savings target

TIAP’s position is that the target of reducing energy and power costs by 50 percent compared to a reference building meeting the minimum requirements of ASHRAE Standard 90.1-2001 must be only with respect to the sum of the costs for interior lighting systems, heating, cooling, ventilation and hot water systems as per the specific requirements of the legislation. Meeting this requirement qualifies the taxpayer to claim a deduction of \$1.80 per square foot of building area. TIAP believes that the 50 percent reduction does not apply to total building energy and power costs that may include other energy end-uses such as cooking, refrigeration, office equipment and other end-uses not regulated by the ASHRAE standard.

Data supporting this approach are illustrated below in Figure 1 which shows average energy end-use shares for all US commercial buildings in 1995, the latest year for which end-use data is published (data on end-use energy and power costs are not available.) It shows that 79.5 percent of total building energy usage is in the five end-uses covered by ASHRAE Standard 90.1 (space heating, cooling, ventilation, water heating and lighting.) All other end-uses comprise 20.5 percent of total building energy use and are not covered by the ASHRAE standard. Reducing the ASHRAE end-uses by 50 percent to obtain the full tax deduction is very challenging, but achievable using “energy efficient commercial building property” installed as part of lighting, mechanical and building envelope systems. However, interpreting the legislation as requiring a 50 percent reduction for total building energy use—including non-ASHRAE end-uses—places an additional burden on an already difficult task, and is not consistent with the legislative intent.

Figure 1 – Average US Commercial Building End-Use Shares



Source: Energy Information Administration Commercial Building Energy Consumption Survey

Partial deductions for mechanical, lighting and envelope systems

Section 1331 allows a partial deduction of \$0.60 per square foot if building lighting, mechanical (heating, cooling, ventilation and water heating) and envelope systems satisfy energy and power cost reduction targets established by the Treasury Secretary in consultation with the Secretary of Energy. TIAP strongly recommends against a straight one-third allocation of the 50 percent whole building target to each of the three building subsystems. Such an approach would be technically inappropriate as well as inequitable to many energy efficiency products and services.

Figure 2 – Default Partial Deduction Target

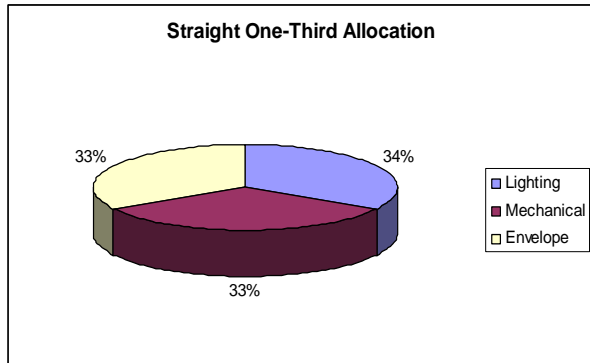
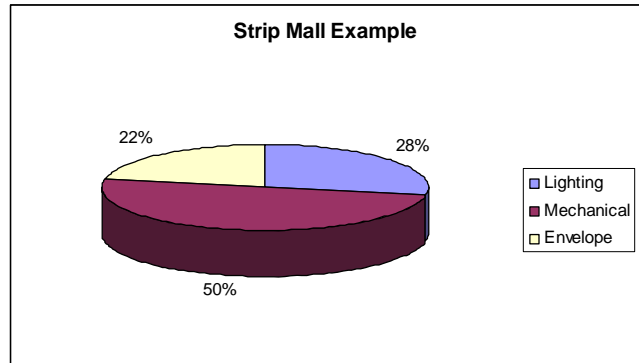


Figure 3 – Real Building Design Example



This concept is illustrated in the example pie charts in Figures 2 and 3 above. Figure 2 shows the “default” partial deduction targets for lighting, mechanical and envelope systems allocated on an equal one-third basis. Assuming that the 50 percent reduction target is applied equally to each of the three building subsystems, each subsystem would be required to reduce energy costs by about 16.7 percent. This “default” allocation would be presumably applied to all buildings irrespective of building type and climate location.

Extensive discussions within the TIAP and NEMA coalition members have brought forth significant concerns about whether each individual building subsystem can achieve this reduction equitably. For example, it may be much easier to reach this target in the mechanical subsystems than in the lighting and envelope systems because of the much larger responsibility that mechanical systems have with respect to total building energy costs for the five ASHRAE end-uses. As previously shown in Figure 1, on a national average basis, building mechanical systems (heating, cooling, ventilation and water heating) make up 72 percent of the ASHRAE end-uses while lighting systems make up the remaining 28 percent. On a practical basis there is a much larger potential to meet “default” targets in mechanical systems than there is for lighting.

In contrast, Figure 3 shows case study building simulation results for a 100,000 square foot strip mall located in Massachusetts, modeled to be in exact compliance with ASHRAE Standard 90.1-2001. The simulation results show that 50 percent of the energy costs are attributable to mechanical systems and 28 percent attributable to lighting systems. An engineering algorithm was used to separate the effects of building envelope on energy costs, yielding an estimate of 22 percent of energy costs attributable to building envelope. This is much more in line with the national average data of real-world building energy use shown in Figure 1. Applying a 50 percent reduction requirement to these building-specific circumstances provides a much more realistic and equitable set of energy efficiency strategies to meet the legislative intent. In the case of this strip mall example, the following comparisons in approach can be made as shown in Table 2.

Table 2 – Comparison of Energy Cost Reduction Approaches

Building Subsystem	Actual Responsibility for Energy Costs (%) in Figure 3	Reduction Target (%)	Realistic Subsystem Cost Reduction Required (%)	“Default” Assumption for Energy Cost Responsibility (%) in Figure 2	Reduction Target (%)	“Default” Subsystem Cost Reduction Required (%)
Envelope	22%	50%	11%	33.3%	50%	16.7%
Lighting	28%	50%	14%	33.3%	50%	16.7%
Mechanical	50%	50%	25%	33.3%	50%	16.7%

The key lesson shown in Table 1 indicates that the energy cost reductions required to meet partial tax deduction requirements track, and are proportional to, the actual contributions and responsibilities of those building subsystems to total ASHRAE end-use costs. In contrast, the “default” one-third allocation requiring 16.7 percent reductions is challenging to meet for envelope and lighting systems, and not so difficult for mechanical systems. Choosing the “default” approach can provide a disadvantage and implementation barrier to encouraging envelope and lighting systems strategies to be pursued to claim the tax incentives. While the single case study example shown above is illustrative of the problem, it is also in line with actual national commercial building energy usage patterns shown in Figure 1.

As a solution to this problem, TIAP recommends a policy whereby each building subsystem (mechanical, lighting and envelope) has an appropriate energy cost reduction target that is proportional to the building subsystem’s contribution to these costs. Such contributions will vary widely according to building type and climate location. After examining several alternatives, TIAP recommends that “custom” targets for partial deductions be allowed for each subject building based on the end-use energy and power costs as determined through a building simulation of the ASHRAE-compliant reference building. Once the proper contribution of the three building subsystems has been determined, the 50 percent reduction target would be applied to each to qualify for the tax deduction.

This approach requires a procedure to determine the contribution and responsibility of the building envelope system to total ASHRAE energy costs. However, the building envelope system is not a specific energy end-use, such as lighting or water heating, which is typically reported by building simulation programs. Therefore a procedure is required to calculate the envelope effects in order to set these custom targets for each building.

In our later discussion of recommendations for Qualified Computer Software, we are recommending that that these custom targets be automatically generated from the baseline ASHRAE Standard 90.1-2001 compliant building simulation that is required for each building. Since these simulations are to be done according to a 2005 California Alternative Calculation Method (ACM) based protocol, the custom targets will be generated according to strict rules without software user intervention.

An excerpt from our proposed rules for the Qualified Computer Software (see next section and Appendix 1) that deals with the setting of these custom targets for the partial deductions is shown in Figure 4. We believe this approach will treat each building fairly with respect to the partial deductions for envelope, mechanical and lighting systems.

Figure 4 – Proposed Methodology to Set Custom Energy Cost Reduction Targets

TREATMENT OF PARTIAL DEDUCTIONS-The software shall be capable of automatically generating the energy cost reductions targets to be met for the partial deductions for envelope, mechanical and lighting systems. The following criteria apply to the calculation of such partial targets:

- i. The partial deduction energy cost reduction targets shall be calculated for each subject building on a custom basis based on the results of the *baseline building design*.
- ii. The partial deduction energy cost reduction targets shall be based only on the total energy and power costs for the five energy end-uses covered by ASHRAE Standard 90.1-2001 which are: heating, cooling, ventilation, water heating and lighting.
- iii. The method for allocating these end-use energy and power costs into the building system categories of envelope, mechanical and lighting shall assure that they are proportional to the building subsystem's responsibility and contribution to these costs.
- iv. The software shall generate the partial deduction cost reduction targets according to these definitions:
 1. The envelope system shall include only the effects of walls, roofs, doors, basements and foundations, air infiltration and all fenestration. The envelope-related effects of daylighting shall be taken into account if daylighting is a design feature of the *baseline building design*.
 2. The mechanical system shall include the effects of ventilation, water heating and any net heating and cooling effects that do not include the envelope effects defined above.
 3. The lighting system shall include energy and power for artificial lighting and the net effect of internal heat gains due to lighting.

For the longer term, TIAP also recommends that DOE develop and publish prescriptive tables of building envelope criteria and HVAC equipment efficiency criteria that can be used to qualify buildings for these partial deductions. These criteria can be published in tables according to the format in ASHRAE Standard 90.1-2004. Publishing such criteria will simplify compliance for the tax deductions and extend this energy cost reduction opportunity to buildings that would not otherwise participate. Such tables should be prepared and published in 2006, for use during the 2006-2007 period covered by the present tax incentives, and also for use in subsequent years if the credits are extended.

Energy analysis software certification

TIAP believes that complete guidelines for certification of energy analysis software are needed in order to provide guidance to building owners and the energy analyst community as soon as possible to January 1, 2006 when the tax deductions go into effect. These guidelines are needed to provide timely guidance to taxpayers seeking the tax deductions, and to be responsive to the significant lead time required to incorporate energy efficient design strategies into new construction projects. In addition, energy analysis software developers need this guidance immediately in order to bring this new type of software to the market as soon as possible.

To facilitate development and use of this new software, TIAP has proposed a set of rules for certifying qualified energy analysis software that are presented in Appendix 1. This set of proposed rules address the following technical, procedural and administrative topics:

- Simulation model accuracy
- Technical criteria for energy efficiency
- ACM methodology (based on the 2005 California Nonresidential Alternative Calculation Method Approval Manual or ACM)
- Geographic coverage of the software
- Treatment of the partial deductions
- Forms and reports
- Certification administrative procedures

These proposed software certification rules were developed through extensive discussions with many interested parties including software developers, energy analysis practitioners, technical professional societies, state government energy officials, energy efficiency advocates and trade associations representing the products and services necessary to achieve these energy cost reduction targets. The TIAP recommendations represent a consensus viewpoint on what is necessary to bring this software to the marketplace in a timely manner. Prospective software developers, for example, estimate that a clear specification such as proposed TIAP rules could facilitate the delivery of such software to the marketplace in a three to six month timeframe. We urge DOE and the Treasury Department to adopt these rules and publish them as soon as possible.

The TIAP parties have also concluded that interim procedures that are not based on the ACM approach are not permitted by the legislation. Therefore, these rules and specifications are needed by the energy analysis and software development community as soon as possible.

We encourage DOE and Treasury to not let the “perfect be the enemy of the good” in setting forth this guidance. Time is of the essence in publishing this guidance so that long lead time commercial building design projects have a clear direction to follow at the beginning of 2006. DOE and Treasury should also rely on the experience and capabilities of private sector energy software developers who can produce this unique product—national ACM software—according to timely DOE and Treasury guidance.

Looking forward, TIAP recommends that DOE engage with interested parties such as TIAP, ASHRAE, USGBC, IBPSA-USA (the United States regional affiliate of the International Building Performance Simulation Association,) and others to propose any refinements to the energy analysis rules or correct any oversights or omissions. Unlike the residential sector, commercial building energy analysis does not have a comparable infrastructure such as RESNET to handle the details of software certification, acceptable procedures for its use or certification of individuals qualified to do that type of work. In the commercial sector, it is important in the long term to find workable solutions to these issues.

Certifications

EPA 2005 requires “qualified individuals” to determine compliance of buildings with energy savings plans and targets and to carry out any “inspections and testing” needed for compliance.

TIAP reads the legislation as requiring two types of individuals: 1) qualified energy analysts, and 2) qualified verification inspectors. The energy analyst is needed to prepare an analysis showing that the building meets the energy savings thresholds established in the law and to prepare a list of key equipment and other building measures that are needed to reach the savings target. The verification inspectors take the list of key equipment and measures and inspect the building as built to verify that the equipment and measures are installed, meet specification, and are placed in service.

TIAP offers recommendations for both of these types of individuals. However, the recommendations are based on a number of factual circumstances that need to be faced in the short time before the tax deductions go into effect on January 1, 2006 for a period of two years (possible extensions notwithstanding.) These circumstances include:

- As of November 2005, we were not able to identify any special certification programs that, in our view, meet the requirements of the legislation. While there is certainly the potential for a number of organizations to propose and develop certification programs, it is unlikely that any organization (to be certified by the Secretary of Treasury) can field an effective program by the time the tax deductions go into effect.
- There is a vibrant “cottage industry” of commercial building energy analysts that routinely perform this type of work for public and private building clients, and their paper qualifications vary widely. Experienced and capable energy analysts include licensed professionals (AIA and PE) but many are not.
- A recent TIAP survey of building energy analysts¹ indicates that a professional license alone does not provide sufficient qualification to do this specialty work. The main factors in successful building energy modeling are experience, study and staying current in the field through professional society activities.
- Other qualifications or recognition programs also do not guarantee competency in this highly specialized work. For example the AEE Certified Energy Manager program recognizes individuals who have taken special training and passed the qualifying exam. However, the specialty area of building energy simulation is not the focus of the certificate and relevant modeling experience needs to be included. Similarly, the LEED-AP certification does not focus on this specialty area.

With the foregoing in mind, TIAP offers interim recommendations that can be put in place in time for the effective date of the tax deductions.

Certification of energy analysts. TIAP recommends that, on an interim basis, persons bearing responsibility for the building energy analysis need to sign off that: 1) the analysis uses an approved building simulation program, 2) the analysis results support the claim for the tax deduction, and 3) the individual performing the analysis meets the requirements shown in Figure 5.

¹ TIAP recently contacted about 1,200 active building energy analysts via email through three email listservs: ibpsausa, BLDG-SIM, and TC47-L. Recipients were asked to respond to and comment on a number of questions addressing existing certification programs, available training courses, level of experience required, documentation of such experience, suitability of certain licenses and certifications (AIA, PE, CEM, LEED-AP), and the option of simply having the licensed design professional sign off on the building energy simulation. Responses to the TIAP inquiry have helped to form our recommendations.

Criterion 1 in Figure 5 ensures that the energy analyst has an appropriate degree of professional standing in the commercial building sector. Criterion 2 in Figure 5 ensures that the energy analyst has the necessary level of knowledge and experience of computer-based commercial building energy analysis. As per Criterion 3 in Figure 5, an *Energy Analyst Qualifications Form* (See the proposed form in Appendix 2) would need to be retained in the records for each submission for a tax deduction; false statements would result in the loss of license or certification in addition to any IRS sanctions. The energy analyst should also sign off on the Notice to Owner required by the legislation.

Figure 5 – Requirements for a Certified Energy Analyst

General Requirements

The services of an Energy Analyst are required to support all claims for a Commercial Building Tax Deduction. The Energy Analyst shall be an individual who is responsible for preparation of the building energy analysis and the Energy Analysis Report. Persons other than the Energy Analyst may be involved in the preparation of the energy analysis and energy analysis report, however they must work under the direction of the Energy Analyst, who bears ultimate responsibility for the accuracy of the work. The Energy Analyst must be a licensed professional engineer (PE), a registered architect (RA) or an AEE Certified Energy Manager and the Energy Analyst must have documented knowledge and experience of building energy simulation.

Anyone meeting the following criteria is deemed to be certified in the year 2006 as a qualified Energy Analyst for the purposes of the EAct 2005 commercial building tax deductions:

1. Be a Registered Architect, Professional Engineer or an AEE Certified Energy Manager.
2. Possess the qualifications defined immediately below.
3. Accurately complete an Energy Analyst qualifications form to document experience and capabilities

Qualifications

The Energy Analyst should have the following experience:

1. Broad experience with commercial and institutional building energy systems and operating characteristics that are similar to those in the building for which the tax deduction is claimed.
2. Three (3) or more years of equivalent full-time modeling experience with a computerized building model tool for energy analysis similar to that to be used in support of claims for a Commercial Building Tax Deduction. Demonstrated ability to perform energy studies evaluating energy-efficient designs similar to those proposed in the subject building.
3. Demonstrated capability to model basic building features such as internal gains, multiple zones with central HVAC systems, envelope measures that affect thermal transmission, and architectural shading effects. Experience in modeling mechanical systems and central plant partial-load operating efficiencies. Experience with modeling the performance of

artificial and natural lighting systems. Experience with any additional features included in the measures for which a tax deduction is claimed.

In addition, we recommend that the Energy Analyst should not be a direct employee of the building owner or the taxpayer receiving the deduction.

This interim process should be used until such time as a proper building energy analyst certification program can be implemented by one or more organizations. We see no immediate need to grant a certification monopoly to a single organization. However, voluntary third-party certification programs should be encouraged as they will properly inform the marketplace as to an analyst's qualifications.

Looking to the future, we would recommend that DOE encourage third parties to collaborate on a meaningful building energy analyst certification program. Interested parties such as ASHRAE, AEE, USGBC and IBPSA have a common interest in developing a core curriculum for a basic training course and perhaps a certification exam. This process could be informed by the current requirements of Oregon's SEED program requirements (for further information see <http://oregon.gov/ENERGY/CONS/SEED/Guidelines.shtml>.)

Certification of verification inspectors. The verification inspector is generally responsible for approving any verification inspection reports and signing off that 1) the inspection verifies that the energy efficiency property modeled in the simulation program has in fact been installed, 2) that the nameplate ratings for efficiency and equipment quantities used in the simulation model match the installed equipment or materials, and 3) that the equipment has been placed in service by the required date. This information should be used to verify the energy efficiency features of the building as required on the Notice to Owner.

TIAP recommends that, on an interim basis for 2006, no certification of verification inspectors be required. We generally recommend the following:

- The verification inspector should be an entity other than the building owner, the building designer, or the construction contractor. It would be inappropriate for the inspector to be an employee of one of these entities because of the appearance of a conflict of interest.
- An Energy Analyst who is independent of the building owner, the building designer, or the construction contractor should be permitted to perform both the energy analysis and the inspections.
- A building commissioning agent, if used on the project, should be permitted to perform the required inspections as part of their normal commissioning activity.

We feel that it is impractical to field a certification program in time for January 2006. It is likely that multiple verification inspectors may be necessary both for cost control and technical capabilities. For example, there may be a "basic" inspection that involves the counting of lighting fixtures, efficient windows, packaged rooftop units, boilers and so forth, and then checking energy efficiency ratings against nameplate data or catalog cut sheets. This could be done with less costly technician labor. There may also be a need for an "advanced" inspection where complex lighting or HVAC controls are being relied upon to deliver energy cost reductions to qualify for the tax deduction. In this case the inspecting entity should assure that

the control systems in fact has the functionality claimed in the building simulation model by engaging an experienced control engineer or technician.

We also note that there is some relationship between verification inspections for tax deduction purposes and building commissioning. While we are ardent supporters of building commissioning, we must point out that we read the legislation inspection requirements as having limited scope; i.e., the presence or absence of modeled “energy efficient commercial property” that has been “placed in service” on or before the date the tax deductions expire. We do not read the legislation as requiring commissioning of these building systems to qualify for the tax deduction.

Certificate to building owner

Section 1331 requires “...a notice form which documents the energy efficiency features of the building and its projected annual energy costs.” It is also described as “an explanation” to the building owner of these features and energy costs. As we described earlier, the Notice to Owner is also a compliance document that demonstrates achievement of the energy cost reductions required to claim the tax deduction, including meeting the targets for the partial deductions for building subsystems. Further, it should serve as a summary of the verification inspections previously described.

TIAP recommends that DOE and Treasury specify the minimum information and detail that should be provided in this Notice and leave it to private sector energy analysis software developers, energy analysts and the building design professionals to decide on its format. TIAP’s recommendations for the Notice to Owner are shown in the following table.

Table 3 – Information for Notice to Owner

Category	Information Required
Project information	Building name, building type, square footage, location
Building owner	Name, contact information, tax ID
Design team	Architect and/or engineer of record, contact information, state license information
Energy analyst	Name, contact information, qualification form
Verification inspector(s)	Name, contact information
Date placed in service	Date placed in service, date of inspections
Energy efficiency measures	List by building subsystem: mechanical, lighting and envelope. Include short narrative description for non-technical audience. Include quantities of equipment where appropriate and summary efficiency ratings (COP, EER, LPD, U/SHGC for windows, R-values, etc.). This list will be the basis for the verification inspection.
Energy analysis software	Name of software package and version; certification information
Fifty percent cost reduction	Two-column format for <i>proposed building design</i> and ASHRAE-compliant <i>baseline building</i> . Subtotal ASHRAE end-uses and show projected energy use, cost, energy use intensity (e.g. kWh/sq.ft.) and energy cost/sq.ft. Indicate target energy cost for tax deduction. Show pass/fail for target. Subtotal <i>non-ASHRAE</i> end-uses and show projected energy use, cost, energy use intensity and energy cost/sq.ft. Show projected <i>total</i> building and show energy use, cost, energy use intensity and energy cost/sq.ft. Show Energy Star commercial building rating score for both designs if applicable to building type.

Partial deduction	Same as above, but also show custom building subsystem targets from baseline analysis.
Interim lighting rules	Show LPD calculation results for <i>proposed building design</i> and ASHRAE-compliant <i>baseline building</i> . Confirm required controls are part of design.
Inspection report	Certify that all modeled energy efficiency measures have been inspected and placed in service by the required date.
Sign-offs and approvals	Energy Analyst signs and stamps Notice to Owner. Verification Inspector signs and stamps Notice to Owner.

Person eligible for deduction for public buildings

In the case of public buildings, the law states: “In the case of energy efficient commercial building property installed on or in property owned by a Federal, State, or local government or a political subdivision thereof, the Secretary shall promulgate a regulation to allow the allocation of the deduction to the person primarily responsible for designing the property in lieu of the owner of such property. Such person shall be treated as the taxpayer for purposes of this section.”

We recommend that this “person” be designated by the agency owning the building as the individual or firm with primary responsibility for designing, specifying, installing, or assuring the performance of the business property associated with the expected energy savings. In the case of new building construction or major renovation, such person may be the architect or engineer of record, or a design-build firm. In the case of a retrofit, such person may be an energy services company, a utility company providing energy services, a licensed engineer or architect, or a certified energy management professional.

Conclusion

TIAP thanks DOE and Treasury for the opportunity to provide comments in this important matter. We believe the recommendations herein will provide minimal barriers to broad participation in the commercial tax deductions, yet maintain the integrity needed to ensure that building design energy savings are delivered as Congress intended. We look forward to a continued dialog to make the tax deduction program productive for America’s energy future.

Drafted by:
 Harry Misuriello
 Alliance to Save Energy
 Chair, TIAP Commercial Buildings Subcommittee
 202 530 2214
Misuriello@ase.org

Appendix 1
Commercial Buildings Tax Deduction Software Requirements

TIAP Proposed Rules for Qualified Computer Software

1. GENERAL-Any calculation performed to claim commercial building tax deductions for energy efficient property shall be prepared by qualified computer software. However, for the interim lighting partial deduction, use of software is optional.
2. QUALIFIED COMPUTER SOFTWARE- For purposes claiming the commercial building tax deductions, the term `qualified computer software' means software--
 - a. for which the software designer has certified that the software meets all procedures and detailed methods for calculating energy and power consumption and costs as further specified in these rules,
 - b. which provides such forms as required to be filed by the taxpayer in connection with energy efficiency of property and the deduction allowed under Section 1331 of the Energy Policy Act of 2005 and
 - c. which provides a notice form which documents the energy efficiency features of the building and its projected annual energy costs.
3. QUALIFIED COMPUTER SOFTWARE REQUIREMENTS-Such software shall meet the following requirements:
 - a. ACCURACY-The simulation program shall be tested according to ASHRAE/ANSI Standard 140-2004 – Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs, and the results shall be posted on the worldwide web in a location readily accessible to potential users who are seeking information on the software
 - b. TECHNICAL CRITERIA FOR ENERGY EFFICIENCY-provide building energy simulations to compare a *proposed building design* eligible to receive the tax deduction to a *baseline building design* that exactly meets the technical requirements of ASHRAE Standard 90.1-2001 as in effect on April 2, 2003.
 - c. ACM METHODOLOGY AND PROTOCOL-The software shall execute such simulations using the protocol of the 2005 California Nonresidential Alternative Calculation Method Approval Manual (ACM) suitably modified to exactly apply the requirements of ASHRAE Standard 90.1-2001 to the *baseline building design*.
 - i. The configuration and simulation of the *baseline building design* shall be executed automatically by the software and shall not allow modifications to the *baseline building design* by the software user.
 - ii. The simulation of the *baseline building design* shall be based on the user's inputs for the *proposed building design* where the user shall have full control over the inputs, as permitted in the ACM, except where such inputs are specified by ASHRAE 90.1-2001, in which case, the software shall automatically reconfigure the *proposed building design* to correspond to such requirements.
 - iii. Application of the ACM to this process shall not include any simulation rules specific to California's Title 24 building energy efficiency building code.
 - iv. As necessary, the software author may supplement the modified ACM rule set with procedures and methods from the ASHRAE Standard 90.1-2001, Chapter 11, Energy Cost Budget Method and also from the ASHRAE Standard 90.1-2004 Informative Appendix G, Performance Rating Method. If procedures from Informative Appendix G are used, they shall not override the energy efficiency technical criteria from ASHRAE Standard 90.1-2001 or the procedures required in the ACM..
 - v. The software shall utilize the ACM "HVAC systems map" to select the HVAC system type for the *baseline building design* to assure neutrality of fuel type.

- vi. The software shall follow the rules and procedures of ASHRAE Standard 90.1-2001 for the implementation of natural lighting (“daylighting”) in the *proposed building design* and the *baseline building design*.
- d. GEOGRAPHIC COVERAGE-The software shall be applicable to buildings located in the United States, its territories and possessions.
- e. TREATMENT OF PARTIAL DEDUCTIONS-The software shall be capable of automatically generating the energy cost reductions targets to be met for the partial deductions for envelope, mechanical and lighting systems. The following criteria apply to the calculation of such partial targets:
 - i. The partial deduction energy cost reduction targets shall be calculated for each subject building on a custom basis based on the results of the *baseline building design*.
 - ii. The partial deduction energy cost reduction targets shall be based only on the total energy and power costs for the five energy end-uses covered by ASHRAE Standard 90.1-2001 which are: heating, cooling, ventilation, water heating and lighting.
 - iii. The method for allocating these end-use energy and power costs into the building system categories of envelope, mechanical and lighting shall assure that they are proportional to the building subsystem’s responsibility and contribution to these costs.
 - iv. The software shall generate the partial deduction cost reduction targets according to these definitions:
 - 1. The envelope system shall include only the effects of walls, roofs, doors, basements and foundations, air infiltration and all fenestration. The envelope-related effects of daylighting shall be taken into account if daylighting is a design feature of the *baseline building design*.
 - 2. The mechanical system shall include the effects of ventilation, water heating and any net heating and cooling effects that do not include the envelope effects defined above.
 - 3. The lighting system shall include energy and power for artificial lighting and the net effect of internal heat gains due to lighting.
- f. FORMS AND REPORTS-The software shall generate the forms and reports, including a Notice to Owner, as specified by the Internal Revenue Service.
 - i. The software shall also generate a building energy performance score by linking to, or otherwise utilizing, the Environmental Protection Agency’s Energy Star commercial building rating system where it is applicable to the subject building.
 - ii. The software developer may generate any other reports deemed necessary at the developer’s option.
- g. CERTIFICATION-The software developer shall certify to the Internal Revenue Service that qualified computer software meets the requirements above. Such self-certification shall be provided to the Internal Revenue Service and be included with each copy of any and all versions of the qualified software. The self-certification letter or notice shall be posted on web sites associated with the software developer or software product.

Appendix 2

Proposed TIAP Energy Analyst Qualifications Form
Energy Analyst's Name, Contact Information, and AI, PE, or CEM Certification:
Describe the qualifications of the Energy Analyst responsible for the accuracy of the energy model and the Energy Analysis Report:
Description of previous experience with the computerized, hourly building simulation tool used for energy analysis for this project. How recent is this previous experience?
List computer modeling programs with which the energy analyst has experience including years of experience with each modeling program:
Provide three reference contacts for energy modeling experience:
List name(s) of others who have worked on the model and report and describe what their roles have been:
List previous projects on which the Energy Analyst has performed computer modeling. List up to five projects:
Number of years of equivalent full-time energy modeling experience (provide dates):
Has the Energy Analyst taken any energy modeling workshops or training in the building simulation tool used in the analysis submitted in support of the tax deduction claim? Date(s) of workshop or training:

Attachment 1

H.R.6

Energy Policy Act of 2005 (Enrolled as Agreed to or Passed by Both House and Senate)

Subtitle C--Conservation and Energy Efficiency Provisions

SEC. 1331. ENERGY EFFICIENT COMMERCIAL BUILDINGS DEDUCTION.

(a) In General- Part VI of subchapter B of chapter 1 (relating to itemized deductions for individuals and corporations), as amended by this Act, is amended by inserting after section 179C the following new section:

SEC. 179D. ENERGY EFFICIENT COMMERCIAL BUILDINGS DEDUCTION.

- (a) In General- There shall be allowed as a deduction an amount equal to the cost of energy efficient commercial building property placed in service during the taxable year.
- (b) Maximum Amount of Deduction- The deduction under subsection (a) with respect to any building for any taxable year shall not exceed the excess (if any) of--
- (1) the product of--
 - (A) \$1.80, and
 - (B) the square footage of the building, over
 - (2) the aggregate amount of the deductions under subsection (a) with respect to the building for all prior taxable years.
- (c) Definitions- For purposes of this section--
- (1) ENERGY EFFICIENT COMMERCIAL BUILDING PROPERTY- The term 'energy efficient commercial building property' means property--
 - (A) with respect to which depreciation (or amortization in lieu of depreciation) is allowable,
 - (B) which is installed on or in any building which is--
 - (i) located in the United States, and
 - (ii) within the scope of Standard 90.1-2001,
 - (C) which is installed as part of--
 - (i) the interior lighting systems,
 - (ii) the heating, cooling, ventilation, and hot water systems, or
 - (iii) the building envelope, and
 - (D) which is certified in accordance with subsection (d)(6) as being installed as part of a plan designed to reduce the total annual energy and power costs with respect to the interior lighting systems, heating, cooling, ventilation, and hot water systems of the building by 50 percent or more in comparison to a reference building which meets the minimum requirements of Standard 90.1-2001 using methods of calculation under subsection (d)(2).

`(2) STANDARD 90.1-2001- The term `Standard 90.1-2001' means Standard 90.1-2001 of the American Society of Heating, Refrigerating, and Air Conditioning Engineers and the Illuminating Engineering Society of North America (as in effect on April 2, 2003).

`(d) Special Rules-

`(1) PARTIAL ALLOWANCE-

`(A) IN GENERAL- Except as provided in subsection (f), if--

`(i) the requirement of subsection (c)(1)(D) is not met, but

`(ii) there is a certification in accordance with paragraph (6) that any system referred to in subsection (c)(1)(C) satisfies the energy-savings targets established by the Secretary under subparagraph (B) with respect to such system,

then the requirement of subsection (c)(1)(D) shall be treated as met with respect to such system, and the deduction under subsection (a) shall be allowed with respect to energy efficient commercial building property installed as part of such system and as part of a plan to meet such targets, except that subsection (b) shall be applied to such property by substituting `\$.60' for `\$1.80'.

`(B) REGULATIONS- The Secretary, after consultation with the Secretary of Energy, shall establish a target for each system described in subsection (c)(1)(C) which, if such targets were met for all such systems, the building would meet the requirements of subsection (c)(1)(D).

`(2) METHODS OF CALCULATION- The Secretary, after consultation with the Secretary of Energy, shall promulgate regulations which describe in detail methods for calculating and verifying energy and power consumption and cost, based on the provisions of the 2005 California Nonresidential Alternative Calculation Method Approval Manual.

`(3) COMPUTER SOFTWARE-

`(A) IN GENERAL- Any calculation under paragraph (2) shall be prepared by qualified computer software.

`(B) QUALIFIED COMPUTER SOFTWARE- For purposes of this paragraph, the term `qualified computer software' means software--

`(i) for which the software designer has certified that the software meets all procedures and detailed methods for calculating energy and power consumption and costs as required by the Secretary,

`(ii) which provides such forms as required to be filed by the Secretary in connection with energy efficiency of property and the deduction allowed under this section, and

`(iii) which provides a notice form which documents the energy efficiency features of the building and its projected annual energy costs.

`(4) ALLOCATION OF DEDUCTION FOR PUBLIC PROPERTY- In the case of energy efficient commercial building property installed on or in property owned by a Federal, State, or local government or a political subdivision thereof, the Secretary shall promulgate a regulation to allow the allocation of the deduction to the person primarily responsible for designing the property in lieu of the owner of such property. Such person shall be treated as the taxpayer for purposes of this section.

`(5) NOTICE TO OWNER- Each certification required under this section shall include an explanation to the building owner regarding the energy efficiency features of the building and its projected annual energy costs as provided in the notice under paragraph (3)(B)(iii).

`(6) CERTIFICATION-

`(A) IN GENERAL- The Secretary shall prescribe the manner and method for the making of certifications under this section.

`(B) PROCEDURES- The Secretary shall include as part of the certification process procedures for inspection and testing by qualified individuals described in subparagraph (C) to ensure compliance of buildings with energy-savings plans and targets. Such procedures shall be comparable, given the difference between commercial and residential buildings, to the requirements in the Mortgage Industry National Accreditation Procedures for Home Energy Rating Systems.

`(C) QUALIFIED INDIVIDUALS- Individuals qualified to determine compliance shall be only those individuals who are recognized by an organization certified by the Secretary for such purposes.

`(e) Basis Reduction- For purposes of this subtitle, if a deduction is allowed under this section with respect to any energy efficient commercial building property, the basis of such property shall be reduced by the amount of the deduction so allowed.

`(f) Interim Rules for Lighting Systems- Until such time as the Secretary issues final regulations under subsection (d)(1)(B) with respect to property which is part of a lighting system--

`(1) IN GENERAL- The lighting system target under subsection (d)(1)(A)(ii) shall be a reduction in lighting power density of 25 percent (50 percent in the case of a warehouse) of the minimum requirements in Table 9.3.1.1 or Table 9.3.1.2 (not including additional interior lighting power allowances) of Standard 90.1-2001.

`(2) REDUCTION IN DEDUCTION IF REDUCTION LESS THAN 40 PERCENT-

`(A) IN GENERAL- If, with respect to the lighting system of any building other than a warehouse, the reduction in lighting power density of the lighting system is not at least 40 percent, only the applicable percentage of the amount of deduction otherwise allowable under this section with respect to such property shall be allowed.

`(B) APPLICABLE PERCENTAGE- For purposes of subparagraph (A), the applicable percentage is the number of percentage points (not greater than 100) equal to the sum of--

`(i) 50, and

`(ii) the amount which bears the same ratio to 50 as the excess of the reduction of lighting power density of the lighting system over 25 percentage points bears to 15.

`(C) EXCEPTIONS- This subsection shall not apply to any system--

`(i) the controls and circuiting of which do not comply fully with the mandatory and prescriptive requirements of Standard 90.1-2001 and which do not include provision for bilevel switching in all occupancies except hotel and motel guest rooms, store rooms, restrooms, and public lobbies, or

`(ii) which does not meet the minimum requirements for calculated lighting levels as set forth in the Illuminating Engineering Society of North America Lighting Handbook, Performance and Application, Ninth Edition, 2000.

`(g) Regulations- The Secretary shall promulgate such regulations as necessary--

`(1) to take into account new technologies regarding energy efficiency and renewable energy for purposes of determining energy efficiency and savings under this section, and

`(2) to provide for a recapture of the deduction allowed under this section if the plan described in subsection (c)(1)(D) or (d)(1)(A) is not fully implemented.

`(h) Termination- This section shall not apply with respect to property placed in service after December 31, 2007.'

(b) Conforming Amendments-

(1) Section 1016(a) is amended by striking `and' at the end of paragraph (30), by striking the period at the end of paragraph (31) and inserting `, and', and by adding at the end the following new paragraph:

`(32) to the extent provided in section 179D(e).'

(2) Section 1245(a), as amended by this Act, is amended by inserting `179D,' after `179C,' both places it appears in paragraphs (2)(C) and (3)(C).

(3) Section 1250(b)(3) is amended by inserting before the period at the end of the first sentence `or by section 179D'.

(4) Section 263(a)(1), as amended by this Act, is amended by striking `or' at the end of subparagraph (I), by striking the period at the end of subparagraph (J) and inserting `, or', and by inserting after subparagraph (J) the following new subparagraph:

`(K) expenditures for which a deduction is allowed under section 179D.'

(5) Section 312(k)(3)(B), as amended by this Act, is amended by striking `179, 179A, 179B, or 179C' each place it appears in the heading and text and inserting `179, 179A, 179B, 179C, or 179D'.

(c) Clerical Amendment- The table of sections for part VI of subchapter B of chapter 1, as amended by this Act, is amended by inserting after section 179C the following new item:

`Sec. 179D. Energy efficient commercial buildings deduction.'

(d) Effective Date- The amendments made by this section shall apply to property placed in service after December 31, 2005.

Attachment 2

FACT SHEET

Tax Incentive Assistance Project

The Tax Incentives Assistance Project (TIAP) is a joint voluntary effort among parties interested in maximizing public participation in energy efficiency tax incentives included in the comprehensive Energy Policy Act of 2005. Included in the Act are a series of tax incentives to promote advanced energy-saving technologies and practices such as:

- Very efficient new homes and commercial buildings,
- High-efficiency appliances and heating, cooling and water-heating equipment,
- Upgrades to building envelopes in existing homes,
- Hybrid and fuel-cell vehicles, and
- Stationary fuel cell systems and microturbines.

Together, these tax credits are estimated by Congress' Joint Committee on Taxation to represent an investment in energy efficiency of over \$2 billion. Most of the tax incentives cover the 2006-2007 period although some incentives are longer.

The initial Steering Committee was selected by volunteers from among the more than two dozen organizations involved in forming TIAP. Representatives from the following organizations make up this initial Steering Committee: American Council for an Energy Efficient Economy, Alliance to Save Energy, California Energy Commission, Energy Foundation, Environmental Protection Agency, National Electrical Manufacturer's Association, Natural Resources Defense Council, New York State Energy Research and Development Authority and RESNET.

TIAP has established a Residential Subcommittee and a Commercial Subcommittee to develop consensus recommendations to the Departments of Energy and Treasury on implementation and compliance rules for obtaining the respective tax incentives. A web site to serve as an information portal on energy efficiency tax incentive information is also being developed.

TIAP Goals and Objectives

TIAP will focus on the energy-efficiency tax incentives and not on the renewable energy or load management credits that are also included in the bill. To be most effective, some focus is needed, and the groups that work on efficiency are often not the same as the groups working in these other areas. Specific goals regarding energy efficiency are as follows:

- d. To maximize net energy savings achieved under the tax incentives and to extend these savings to all regions of the country.
- e. To use the tax incentives to best leverage long-term market changes so that in the future, efficient products and practices are normal practice, even after the tax incentives end.
- f. To build positive relationships between traditionally opposed organizations that now share interest in promoting the tax incentives, with the intent of those relationships continuing even after the tax incentives end.

Achievement of these goals will require achieving the following TIAP objectives:

1. Develop and maintain appropriate implementing rules for the incentives so that implementation can proceed quickly and smoothly but also so that credits are not abused or do not primarily go to “free riders” (consumers who would implement efficiency actions, even without tax credits). Rules should also discourage use of shoddy or inappropriate products and practices.
2. Organize stakeholders to develop and implement a plan to use the tax incentives as an element of a long term market transformation initiative designed to make these products and practices (including improved sales and marketing techniques and increased focus on buildings as a system) “business as usual” by the time the tax incentives end. Identify barriers, and strategies for addressing these barriers, so that long-term market transformation will result.
3. Build an information backbone, primarily through a web portal service, that details the available incentives (including federal and state), eligible products and systems, and qualification procedures, and routes users through to other resources and organizations that will support use of the incentives.
4. Identify existing and potential private sector allies, both companies and trade associations, make appropriate and prompt outreach to them, discuss promotion plans, and coordinate efforts where deemed mutually beneficial.
5. Reach out to operators of existing energy efficiency programs, including DSM programs, federal programs (e.g. Energy Star and Building America) and state/local programs, to provide information on the tax incentives and provide assistance on ways to use the tax incentives to help accomplish program goals. This may need to include providing information that others can use to support maintenance of existing funding so that the tax credits supplement and not replace existing funding.
6. Reach out to groups involved in large bulk-purchases of products that may be eligible for the tax incentives.
7. Collect and share information, materials and messages developed by stakeholders that groups can use to reach out to their constituents to promote the tax incentives. To a limited extent, some of this information (e.g., the web site) will also reach individual consumers but the primary vehicle should be through groups that are already working with consumers. This information would be coordinated with, and in many cases available through, the web-based information backbone.
8. Coordinate and advise on a media strategy to reach individuals via mass-media and specialized media serving key audiences. Work with business and other allies on this effort. Much of this work will be done by individual organizations; through TIAP organizations can promote their efforts so that the overall promotion effort is more successful. The Alliance to Save Energy is prepared to coordinate this effort.

For more information, contact:

Harry Misuriello
Director of Buildings and Utility Programs
Alliance to Save Energy
202 530 2214
Misuriello@ase.org

Steve Nadel
Executive Director
ACEEE
202 429 8873
snadel@aceee.org