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Series/Staff Member: Roger Ballentine; Paul Bledsoe; Julie Anderson

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UTAH ENERGY CONSERVATION COALITION, INC.
ENERGY RATED HOMES OF UTAH

590 North State Street, Suite F
Orem, UT 84057
801.765.0034 (office) 801,765.1976 (fax) 1.800.550.8322 (instate only)
http://www.utahenergy.org

October 22, 1999

Julie Anderson
White House Climate Change Task force
734 Jackson Place
Washington, D.C. 20006-4922

Dear President Clinton,

I am writing in support of targeted tax credits for energy efficiency. I urge you to make energy efficiency tax credits a top priority in your negotiation with Congress over the tax and budget issues for FY 2000.

Energy efficiency technologies are the best way of solving a number of pressing economic and geopolitical problems, as well as reducing pollution emissions. They offer the prospect of enhancing economic growth, creating more jobs, reducing our nations growing dependence on imported oil, cutting energy prices through slacked demand, as well as cutting emissions of greenhouse pollution and health-related air pollution.

Over 30 years of experience has shown that targeted incentives that are offered for several years can encourage the introduction of significantly-advanced technologies that would not otherwise have made it into the marketplace. By facilitating mass production and introduction of these technologies, their cost is driven down, and they can survive with reduced or eliminated policy interventions in the future. These successes in market transformation would create product availability leveraged by federal tax dollars, with maximum public benefit obtained for the minimum tax revenue loss.

Representative Matsui's "Energy Efficient Technology Tax Act" (H.R. 2380), represents a strong starting position. By including tax credits for upgrading the energy efficiency of existing homes and encouraging the construction of highly-efficient new homes, public policy can have a positive impact on many Americans while supporting local economies and helping the environment at the same time. As long as the energy improvements are documented by an accredited home energy rating, Treasury can be assured that the government's investment is sound.

I am hopeful that you can support energy efficiency tax credits in the current budget proceedings, feel free to contact me regarding my concerns and interest in energy efficiency.

Sincerely,

David A. Wilson
Executive Director

UTAH VALLEY
Associate Member

Contributions to the Utah Energy Conservation Coalition, Inc. are fully tax deductible under Section 501(c)(3) of the Internal Revenue Code

Energy HOMES ALLY

Energy
Rated
Homes
Midwest

1845 W. 18th St.
Indianapolis, IN
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(317) 638-4232
(FAX) 634-7947
(800) 382-9895

October 18, 1999

President Clinton
The White House
1600 Pennsylvania Ave.
Washington, D.C. 20500

Dear President Clinton,

I am writing in support of targeted tax credits for energy efficiency. I urge you to make energy efficiency tax credits a top priority in your negotiations with Congress over the tax and budget issues for FY 2000.

Energy efficiency technologies are the best way of solving a number of pressing economic and geopolitical problems, as well as reducing pollution emissions. They offer the prospect of enhancing economic growth, creating more jobs, reducing our nations growing dependence on imported oil, cutting energy prices through slackened demand, as well as cutting emissions of greenhouse pollution and health-related air pollution.

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We are hopeful that you can support energy efficiency tax credits in the current budget proceedings.

Sincerely,

Mark Jansen

Mark Jansen
Program Director
Energy Rated Homes Midwest

cc: Julie Anderson

Elements of Housing Efficiency Tax Credit

- New homes only
- 2 tier for 5 years -- 30% with $1500 cap and 45% with $2500 cap
- Third party certification (prescriptive: certified home inspectors; performance: home energy raters approved by HERS or NASEO) with provisions for sampling or other means to assure compliance while minimizing transaction costs; consumer disclosure requirements
- Credits to homebuilders
- Fuel neutrality

The Thomas bill without existing homes would cost $750 million over 5 years. The Matsui bill new homes credit provision was scored at $400 million.

General Explanations of the Administration's Revenue Proposals

Department of the Treasury
February 1999

PROVIDE TAX CREDIT FOR ENERGY-EFFICIENT BUILDING EQUIPMENT

Current Law

No income tax credit is provided currently for investment in energy-efficient building equipment.

Reasons for Change

A credit for types of building equipment that are substantially more energy efficient than conventional equipment will help to accelerate the development and distribution of energy-efficient technologies. A credit would reduce costs to consumers, increasing demand for the equipment and reducing manufacturing costs, while also spurring technological innovation and reducing energy consumption.

Proposal

A credit of 10 percent of the purchase price (up to a maximum of $250 per unit) would be allowed for the purchase after December 31, 1999 and before January 1, 2002 of the following building equipment:

Electric heat pumps (equipment using electrically powered vapor compression cycles to extract heat from air in one space and deliver it to air in another space) with a heating efficiency of at least 9 HSPF (Heating Seasonal Performance Factor) and a cooling efficiency of at least 13.5 SEER (Seasonal Energy Efficiency Rating).

Central air conditioners with an efficiency of at least 13.5 SEER.

Advanced natural gas water heaters (equipment using a variety of mechanisms to increase steady-state efficiency and reduce standby and vent losses) with an Energy Factor of at least 0.65 in the standard Department of Energy (DOE) test procedure.

A credit of 20 percent of the purchase price would be allowed for the purchase after December 31, 1999 and before January 1, 2004 of the following building equipment:

Fuel cells (equipment using an electrochemical process to generate electricity and heat) with an electricity-only generation efficiency of at least 35 percent and a minimum generating capacity of 5 kilowatts. The maximum credit would be $500 per kilowatt of capacity.

Electric heat pump hot water heaters (equipment using electrically powered vapor compression cycles to extract heat from air and deliver it to a hot water storage tank) with

an Energy Factor of at least 1.7 in the standard DOE test procedure. The maximum credit would be $500 per unit.

Electric heat pumps with a heating efficiency of at least 9 HSPF and a cooling efficiency of at least 15 SEER. The maximum credit would be $500 per unit.

Central air conditioners with an efficiency of at least 15 SEER. The maximum credit would be $500 per unit.

Advanced natural gas water heaters with an Energy Factor of at least 0.80 in the standard DOE test procedure. The maximum credit would be $500 per unit.

Natural gas heat pumps (equipment using either a gas-absorption cycle or a gas-driven engine to power the vapor compression cycle to extract heat from one source and deliver it to another) with a coefficient of performance for heating of at least 1.25 and for cooling of at least 0.70. The maximum credit would be $1,000 per unit.

A credit would be allowed only for final purchases from unrelated third parties. The credit would be nonrefundable. Credits for equipment used for business purposes would be subject to the limitations on the general business credit and would reduce the basis of the equipment.

TAX CREDIT FOR PURCHASE OF ENERGY EFFICIENT NEW HOMES

Current law

No deductions or credits are provided currently for the purchase of energy-efficient new homes.

Reasons for change

Residences, which account for about one-sixth of all U.S. greenhouse gases, offer one of the largest single sources of carbon saving potential. Some States and certain Federal programs require new houses to meet Model Energy Code standards for insulation and related construction standards, and for heating, cooling and hot water equipment. By the use of cost-effective means, many new homes could reduce energy consumption by 30 to 50 percent or more compared to the standards in the Model Energy Code or the more recent 1998 International Energy Conservation Code (IECC). A targeted credit for such highly energy-efficient new housing could increase the use of energy-efficient building practices and efficient heating and cooling equipment. In addition, it may help spur innovation in the ways that houses are designed and built, thereby providing significant energy-saving and environmental benefits over the long term.

Proposal

A tax credit of up to $2,000 would be available to purchasers of highly energy-efficient new homes that meet energy-efficiency standards for heating, cooling and hot water that significantly exceed those of the IECC. A taxpayer may claim the credit only if the new home is the taxpayer's principal residence and reduces energy use by prescribed amounts as compared to the IECC for single family residences. The tax credit would be $1,000 for new homes that are at least 30 percent more energy efficient than the IECC standard, and that are purchased in the two-year period beginning January 1, 2000 and ending December 31, 2001. The tax credit would be $1,500 for new homes that are at least 40 percent more energy efficient than the IECC standard, and purchased in the three-year period beginning January 1, 2000 and ending December 31, 2002. The tax credit would be $2,000 for new homes that are at least 50 percent more energy efficient than the IECC standard, and purchased in the five-year period beginning January 1, 2000 and ending December 31, 2004.

EXTEND TAX CREDIT FOR ELECTRIC VEHICLES AND PROVIDE TAX CREDIT FOR CERTAIN FUEL-EFFICIENT HYBRID VEHICLES

Current Law

No generally available income tax credit for purchases of fuel-efficient vehicles is provided currently. A 10-percent tax credit is provided for the cost of a qualified electric vehicle, up to a maximum credit of $4,000. A qualified electric vehicle is a motor vehicle that is powered primarily by an electric motor drawing current from rechargeable batteries, fuel cells, or other portable sources of electric current, the original use of which commences with the taxpayer, and that is acquired for use by the taxpayer and not for resale. The full amount of the credit is available for purchases prior to 2002. The credit begins to phase down in 2002 and does not apply to vehicles placed in service after 2004.

Certain costs of qualified clean-fuel vehicle property may be deducted when such property is placed in service. Qualified electric vehicles do not qualify for the clean-fuel vehicle deduction. The deduction begins to phase down in 2002 and does not apply to property placed in service after 2004.

Reasons for Change

The transportation sector now accounts for one-third of greenhouse gas emissions in the United States. Cars, sport utility vehicles, light trucks and minivans alone account for 20 percent of our greenhouse gas emissions.

The proposed credits will encourage the early introduction and purchase of vehicles that incorporate new fuel-efficient technologies and will help to move ultra fuel-efficient vehicles with two or three times the fuel efficiency of today's vehicles from the laboratory to the highway. These vehicles can significantly reduce emissions of carbon dioxide, the most prevalent greenhouse gas.

Proposal

The proposal would extend the present credit for qualified electric vehicles and provide temporary tax credits for fuel-efficient hybrid vehicles:

(1) Credit for electric vehicles. The phase down of the credit for electric vehicles would be eliminated and the credit would be extended through 2006. Thus, the maximum $4,000 credit would be available for purchases before 2007.

(2) Credit for fuel-efficient hybrid vehicles. The credit would be: (a) $1,000 for each vehicle that is one-third more fuel efficient than a comparable vehicle in its class, effective for purchases of qualifying vehicles after December 31, 2002 and before January 1, 2005; (b) $2,000 for each vehicle that is two-thirds more fuel efficient than a comparable vehicle in

its class, effective for purchases of qualifying vehicles after December 31, 2002 and before January 1, 2007; (c) $3,000 for each vehicle that is twice as fuel efficient as a comparable vehicle in its class, effective for purchases of qualifying vehicles after December 31, 2003 and before January 1, 2007; and (d) $4,000 for each vehicle that is three times as fuel efficient as a comparable vehicle in its class, effective for purchases of qualifying vehicles after December 31, 2003 and before January 1, 2007.

A qualifying hybrid vehicle would be a vehicle powered by onboard fuel which uses regenerative braking and an energy storage system that will recover at least 60 percent of the energy in a typical 70-0 braking event. A qualifying vehicle would have to meet all emission requirements applicable to gasoline-powered automobiles.

These credits would be available for all qualifying light vehicles including cars, minivans, sport utility vehicles, and light trucks. Taxpayers who claim one of these credits would not be able to claim the qualified electric vehicle credit or the deduction for clean-fuel vehicle property for the same vehicle.

INVESTMENT TAX CREDIT FOR COMBINED HEAT AND POWER (CHP) SYSTEMS

Current law

Combined heat and power (CHP) systems are used to produce electricity (and/or mechanical power) and usable thermal energy from a single primary energy source. Depreciation allowances for CHP property vary by asset use and capacity. Assets employed in the production of electricity used by the taxpayer in an industrial manufacturing process or plant activity (and not ordinarily available for sale to others) have a general cost recovery period of 15 years if rated with total capacity in excess of 500 kilowatts. Electricity production assets of lesser rated capacity generally are classified with other manufacturing assets and have cost recovery periods of five to ten years. Assets used in the production of electricity for sale have either a 15-year or 20-year recovery period. For assets that are structural components of buildings, however, the recovery period is either 39 years (if nonresidential) or 27.5 years (if residential), and the straight-line method for computing depreciation allowances must be used. For assets with recovery periods of 10 years or less, the 200 percent declining balance method may be used to compute depreciation allowances. The 150 percent declining balance method may be used for assets with recovery periods of 15 or 20 years.

Reasons for change

Combined heat and power systems utilize thermal energy that is otherwise wasted in producing electricity by more conventional methods. CHP systems achieve a greater level of overall energy efficiency, and thereby lessen the consumption of primary fossil fuels, lower total energy costs, and reduce carbon emissions. An investment tax credit for CHP assets is expected to encourage increased energy efficiency by accelerating planned investments and inducing additional investments in such systems. The increased demand for CHP equipment should, in turn, reduce CHP production costs and spur additional technological innovation in improved CHP systems.

Proposal

The proposal would establish an 8-percent investment credit for qualified CHP systems with an electrical capacity in excess of 50 kilowatts or with a capacity to produce mechanical power in excess of 67 horsepower (or an equivalent combination of electrical and mechanical energy capacities). CHP property would be defined as property comprising a system that uses the same energy source for the simultaneous or sequential generation of (1) electricity or mechanical shaft power (or both) and (2) steam or other forms of useful thermal energy (including heating and cooling applications). A qualified CHP system would be required to produce at least 20 percent of its total useful energy in the form of thermal energy and at least 20 percent of its total useful energy in the form of electrical or mechanical power (or a combination thereof) and would also be required to satisfy an energy-efficiency standard. For CHP systems with an electrical capacity in excess of 50 megawatts (or a mechanical energy capacity in excess of 67,000 horsepower), the total energy

efficiency of the system would have to exceed 70 percent. For smaller systems, the total energy efficiency would have to exceed 60 percent. For this purpose, total energy efficiency would be calculated as the sum of the useful electrical, thermal, and mechanical power produced by the system at normal operating rates, measured on a Btu basis, divided by the lower heating value of the primary fuel source for the system supplied. The credit would be allowed with respect to qualified CHP property only if its eligibility is verified under regulations prescribed by the Secretary of the Treasury. The regulations would require taxpayers claiming the credit to obtain proper certification by qualified engineers that the system meets the energy-efficiency and percentage-of-energy tests.

Investments in qualified CHP assets that are otherwise assigned cost recovery periods of less than 15 years would be eligible for the credit, provided that the taxpayer elected to treat such property as having a 22-year class life. Thus, regular tax depreciation allowances would be calculated using a 15-year recovery period and the 150 percent declining balance method.

The credit would be treated as energy property under the investment credit component of the section 38 general business credit, and would be subject to the rules and limitations governing such property. Thus, only property placed in service in the United States would be eligible for the credit, and the basis of qualified property would be reduced by the amount of the credit. Regulated public utilities claiming the credit would be required to use a normalization method of accounting with respect to the credit. Taxpayers using the credit for CHP equipment would not be entitled to any other tax credit for the same equipment.

The credit would apply to investments in CHP equipment placed in service after December 31, 1999, but before January 1, 2003.

PROVIDE TAX CREDIT FOR ROOFTOP SOLAR EQUIPMENT

Current Law

A 10-percent investment tax credit is provided to businesses for qualifying equipment that uses solar energy to generate electricity, to heat or cool or to provide hot water for use in a structure, or to provide solar process heat.

Reasons for Change

A tax credit for rooftop solar photovoltaic systems and solar water heating systems will reduce the cost of these investments and encourage individuals and businesses to adopt these systems. Heat and electricity from these sources produce no greenhouse gasses.

Proposal

Under this proposal, a tax credit would be available for purchasers of rooftop photovoltaic systems and solar water heating systems that are located on or adjacent to a building and are used exclusively for purposes other than heating swimming pools. The credit would be equal to 15 percent of qualified investment up to a maximum of $1,000 for solar water heating systems and $2,000 for rooftop photovoltaic systems. This credit would be nonrefundable. For businesses, this credit would be subject to the limitations of the general business credit. The depreciable basis of the qualified property would be reduced by the amount of the credit claimed. The credit would apply only to equipment placed in service in the five-year period after December 31, 1999 and before January 1, 2005 for solar water heating systems and for the seven-year period after December 31, 1999 and before January 1, 2007 for rooftop photovoltaic systems. Taxpayers would have to choose between the proposed credit and the present tax credit for each investment.

EXTEND WIND AND BIOMASS TAX CREDIT AND EXPAND ELIGIBLE BIOMASS SOURCES

Current Law

Current law provides taxpayers a 1.5-cent-per-kilowatt-hour tax credit for electricity produced from wind or "closed-loop" biomass (organic material from a plant which is planted exclusively for purposes of being used at a qualified facility to produce electricity). The electricity must be sold to an unrelated third party and the credit is limited to the first 10 years of production. The credit applies only to facilities placed in service before July 1, 1999. The credit amount is indexed for inflation after 1992.

Reasons for Change

The tax credit helps make electricity produced from wind and biomass competitive with other forms of electricity. Expanding eligible biomass sources will increase the use of this renewable energy source. Electricity from these sources produces no greenhouse gases.

Proposal

The proposal would extend the current credit for five years, to facilities placed in service before July 1, 2004, and would expand eligible biomass sources for facilities placed in service before July 1, 2004. In addition, biomass that is co-fired in coal plants to produce electricity would be eligible for the credit at a reduced rate (1.0 cent per kilowatt hour adjusted for inflation after 1999) through June 30, 2004. Biomass qualifying for the credit would include (in addition to closed-loop biomass) any solid, nonhazardous, cellulosic waste material, that is segregated from other waste materials, and that is derived from the following forest-related resources: mill residues, pre-commercial thinnings, slash and brush, but not including old growth timber, waste pallets, crates, and dunnage, and landscape or right-of-way tree trimmings, and biomass derived from agriculture sources, including orchard tree crops, vineyard grain, legumes, sugar, and other crop-by-products or residues. Unsegregated municipal solid waste (garbage) would not qualify for the credit.

Form **88XXB**

Department of the Treasury
Internal Revenue Service

Draft - Energy Efficient New Home Credit

▸ **See the Instructions for Form 88XXB**
▸ **Attach to Form 1040.**

OMB No. xxxx-xxxx

1999

Attachment
Sequence No. **xxx**

Table 1 Required Conservation Measures

	Region 1	Region 2	Region 3	Region 4	Region 5
Ceiling insulation	R-30	R-30	R-38	R-38	R-38
Wall insulation	R-11	R-13	R-16	R-19	R-19
Floor insulation	R-11	R-11	R-19	R-19	R-19
Basement walls			R-11	R-11	R-13
Slab-on-grade			R-6	R-8	R-10
Windows	0.7 U-factor and 0.4 SHGC	0.50 U-factor and 0.4 SHGC	0.40 U-factor	0.40 U-factor	0.35 U-factor
Skylights	0.85 U-factor and 0.4 SHGC	0.55 U-factor and 0.4 SHGC	0.50 U-factor	0.50 U-factor	0.45 U-factor
Doors		0.30 U-factor	0.25 U-factor	0.25 U-factor	0.25 U-factor
Furnace or Heat pump		Furnace with 81% AFUE **and/or** Heat pump with 7.2 HSPF	Furnace with 81% AFUE **and/or** Heat pump with 7.2 HSPF	Furnace with 81% AFUE **and/or** Heat pump with 7.2 HSPF	Furnace with 91% AFUE **and/or** GeoExchange heat pump
Air conditioner	13 SEER	13 SEER	12 SEER	12 SEER	12 SEER
Duct placement	Ducts, including air handling unit, located in conditioned space				
Air leakage	Carefully seal all sources of air leakage in the envelope including joints, seams, and utility penetrations				
Water heater	Gas/Oil with a minimum 0.58 Energy Factor **or** Electric with a minimum 0.92 Energy Factor				
Pipe insulation	R-6 Pipe insulation required for hydronic systems and circulating water heaters				
Thermostats	Thermostats serving more than one room must provide automatic temperature set back / set up				
Energy Certificate	Energy Certificate affixed to wall on or near mail electrical service panel (breaker box)				

Note: All values in the Tables 1 and 2 are minimum values, except U-factor and SHGC, which are maximums.

Table 2 Additional Energy Conservation Measures

A total of 5 points in addition to the requirements in Table 1 must be obtained to receive a $1000 credit.
A total of 10 points in addition to the requirements in Table 1 must be obtained to receive a $1500 credit.
A total of 15 points in addition to the requirements in Table 1 must be obtained to receive a $2000 credit.

Check measures selected	Region 1	Region 2	Region 3	Region 4	Region 5
☐ Envelope Improvements	0	1	1	2	3
☐ Appliance Package	2	2	2	2	2
☐ Airtight construction	1	2	3	3	4
☐ Heat pump water heater	8	7	6	6	6
☐ Solar water heater	9	9	7	6	4
☐ Desuperheater	2	2	1	0	0
☐ 0.65 EF Gas water heater	1	1	1	1	1
☐ 0.85 EF Gas water heater	2	3	3	3	3
☐ 91 AFUE furnace	0	1	2	3	0
☐ 94 AFUE furnace	0	2	3	4	1
☐ 8.4 HSPF heat pump	0	1	2	3	NA
☐ 14 SEER air conditioner	1	1	1	1	0
☐ 85% CAE combined heat	3	4	4	5	2
☐ 90% CAE combined heat	4	5	6	7	4
☐ GeoExchange heat pump	0	3	3	3	0
☐ Windows U-0.35	0	1	1	1	0
☐ Windows U-0.30	0	2	2	2	1
☐ Windows U-0.25	0	2	2	3	2
(sum total of selected measures) **Total Points:**					

10:46 AM - 02/24/99

Form **88XXB**

Department of the Treasury
Internal Revenue Service

Draft - Energy Efficient New Home Credit

▸ **See the Instructions for Form 88XXB**
▸ **Attach to Form 1040.**

OMB No. xxxx-xxxx

1999

Attachment
Sequence No. **xxx**

Name(s) shown on Form 1040 | Your social security number

General Information

A Address of home qualifying for the credit (if different from the address shown on Form 1040)

B County	**C** Region (see Appendix A)	**D** Settlement/closing date **or** date approved for occupancy

Amount of Tax Credit

E Check tax credit amount (check one):

☐ $1000 tax credit (you must meet all requirements in Table 1 and obtain 5 points from Table 2)

☐ $1500 tax credit (you must meet all requirements in Table 1 and obtain 10 points from Table 2)

☐ $2000 tax credit (you must meet all requirements in Table 1 and obtain 15 points from Table 2)

F Enter the tax credit amount checked above.

Energy Conservation Measures Installation Certification

G Contractor/Builder Name

H Company

I Address

J Signature

Last revised 02/24/99 10:46 AM

By signing above you are certifying that all required energy conservation measures from Table 1 **and**, if applicable, additional conservation measures selected from Table 2 have been properly installed, and that the Energy Certificate has been attached to the home (see instructions). If contractor/builder is the homeowner check here ☐

MEMORANDUM

To: Julie Anderson, Climate Change Task Force

cc: Geraldine Gerardi, Dept. of Treasury, Office of Tax Analysis

From: David B. Goldstein

Date: January 11, 1999

Re: Summary of Why it is Inadequate to Legislatively Specify the Tax Credit for New Houses Simply as "X% Below MEC" and a Proposed Solution.

There are three fundamental flaws with defining eligibility criteria for climate tax credits in terms of a percent reduction below MEC:

- It can generate perverse incentives where builders can make decisions that simultaneously qualify them for the tax credit and increase, not reduce, climate emissions; and
- The tax credits could produce large free ridership, paying for measures many of which would have been undertaken anyway; and
- Field experience with a million homes has demonstrated that complex implementation rules will be needed to avoid fraud. A structure based solely on a percentage reduction from MEC requires the type of rulemaking proceeding that opens many controversial issues that the Department of Energy has been unable to resolve in similar rulemaking forums.

Three Tiers of qualification levels for tax credits can still be referred to with "%-below MEC" names, but the actual text of the bill must be more specific.

I. Generation of Perverse Incentives

The choices of how to meet the tax credit are made by the builder, even though the home buyer is the one that gets the tax credit. In most areas, builders can choose between electric and gas heat for both space heating and water heating. These choices have immense climate emissions consequences – larger than the consequences of the tax credits.

Including water heating energy in the calculation generates irremediably perverse incentives. It is virtually impossible to save 50% of gas water heating energy over the MEC base without using a solar water heating, a very expensive and hard-to-find option. In contrast, electric heat pump water heaters, which are minimally available now, but could become mass-produced items in response to the tax credit, could easily save 60% of the MEC base. So the easiest way to qualify for the credit is to use electricity for water heating.

Unfortunately, builders who switch from a minimum efficiency gas water heater to a high efficiency heat pump water heater will produce increases in emissions of greenhouse gases.

Similar perverse incentives could be a problem for heating depending on how the implementation rules are written, even if water heating is excluded from the calculation. It is technically easier to save heating energy than cooling energy and easier to improve the efficiency of an electric heat pump than a gas furnace. If builders switch from gas to electricity to meet the criterion, the resulting electric house will have *higher emissions with the tax "percent below MEC" credit than the base case would without it.*

II. The Free Ridership Problem

It is easy to draw up prescriptive tables of insulation and fenestration measures where the data will show very little free ridership, but allowing any possible tradeoff as a way of meeting the criterion could produce immense free ridership problems, some examples of which follow:

- Ground Source Heat Pumps. This measure alone will produce qualification at the 30% level and probably higher levels. I am told that 50,000 units are installed annually without the tax credit program. This is a minimum of $50 million of tax money given away for nothing.

- The use of ENERGY Star heating and cooling equipment will obtain more than half of the 30% savings. This equipment already has a market share equal to or in excess of 20%, and rising.

- In some states, including the largest, preexisting code already requires almost 30% reductions from MEC. Difference in specification of the code guarantees that a large fraction of the houses must meet the 30% specification *just to meet the state code.*

III. Administrative Problems

It is the homeowner who must comply with IRS regulations to qualify for the tax credit, but consumers generally know almost nothing about the efficiency of their houses. Regulations will have to be written that require builders to provide the documentation in a form that can be submitted to the IRS by the homeowner.

The rules for such documentation, including the calculation procedures, are specified only minimally in the MEC. And some of the specifications that *are* in the MEC run counter to the goal of climate mitigation: very little credit is given in the MEC , for example, for homes that save air-conditioning energy despite its large importance in climate emissions.

Having detailed and specific rules is critical. Extensive field experience in California showed that even when money was not on the line, builders and their consultants got very creative about how to take advantage of ambiguities in the calculational method. These creative methods clearly undercut the intent of the regulation, but were equally clearly legal.

Drawing up rules that are fair to the various interest groups involved – gas interests vs. electric, insulation interests vs. fenestration, equipment manufacturers vs. insulation and window manufacturers, masonry interests vs. frame construction interests, and more, is also complex and controversial. Doing it wrong can generate actually or perceivedly unfair competitive impacts on these interests.

It is hard to draw up rules that are perceivedly fair. Several attempts to implement this have been made by DOE and its contractors and by the Edison Electric Institute, and other agencies, and most or all of them have been stopped short of completion due to controversy.

But there are techniques that have been shown to work. California has evolved a complex set of rules that everybody has learned to accept and that avoid phantom credits. ASHRAE has developed guidelines in their industry consensus Standards 90.1 and 90.2 that have successfully achieved acceptance by all major industry and non-industry groups. These were written under my chairmanship.

Rather than recreate the long and arduous processes that led to consensus solutions, it makes more sense to proceed directly to a "straw man" that is likely to minimize the need for drawn out and controversial regulatory proceedings.

Eventually, even the builders that took advantage of them realized that these loopholes were unfair and agreed to get rid of "phantom credits" simply because they were embarrassing. But no one would voluntarily refrain from using them before the regulations would change. We do not want to recreate this process of trial and error with taxpayer money.

IV. Summary

Meeting an energy or climate emissions specification for builders in a way that is competitively fair, achieves the intended result, and get value for the taxpayer's money is something with which most stakeholder groups have little or no practical experience. Such systems have extensive practical experience at the state and regional level, but almost no experiential expertise at the federal level.

NRDC has been in the thick of the regional and national debates on how to demonstrate compliance with energy or emissions targets by calculation, for over 20 years. This experience, and our interaction with regional experts who have reviewed our proposal, allows us to build on a foundation that has the highest likelihood of working and of minimizing controversy.

NATURAL RESOURCES DEFENSE COUNCIL

MEMORANDUM

To: Climate Mitigation Tax Credit (Matsui Bill) Team

From: David B. Goldstein, Energy Program Co-Director
Natural Resources Defense Council

Date: November 20, 1998

Re: Mid-Course Correction for the Administration's Proposal
PRELIMINARY DRAFT

Executive Summary

NRDC supports the Administration proposal on tax credits that is embodied in the Matsui Bill introduced in the 105th Congress. But, there are some mid-course corrections that are necessary to remedy a few problems of enforceability and misplaced incentives, particularly in the section referring to new buildings.

The current Bill calls for new houses to cut 50% of the energy use from the level defined by the Model Energy Code (MEC) for heating, cooling, and hot water in order to qualify for the tax credit. This is unenforceably vague. The MEC is a prescriptive standard and does not adequately define how to do energy use calculations. Furthermore, energy use as defined in MEC has no public policy interest: this Bill is interested in reducing carbon emissions. Energy and climate calculations are not the same.

The problems identified in doing climate impact calculations from the MEC can be remedied in a straightforward way based on extensive practical experience at the state level. The solution involves:

- Limiting tradeoffs to the building envelope.
- Establishing component specifications for houses that qualify for tax credits, along with detailed calculational rules for equal climate emissions tradeoffs from this component base case.
- Fixing the tax credit at a flat $2,000 per housing unit.

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We recommend that the tax credit be extended to existing homes that meet the same level of performance, either on a whole house basis or a component by component basis.

For the transportation vehicle tax credits, we recommend that compliance be based on two and three-fold reductions in fuel cycle carbon emissions rather than the less accurate criterion of miles-per-gallon. We further recommend that California SULEV standards be met as a requirement for qualifying for tax credits in order to assure that the new technologies brought forth continue to be allowed under air quality regulations.

This Bill attempts, successfully, we believe, to maximize climate emissions reductions within a very strict budget constraint. Much larger economic and environmental benefits could be obtained with a larger budget with additional revenue enhancements.

I. Overview

This Bill is fundamentally on the right track if our goal is obtaining the maximum amount of cost-effective climate emissions mitigation technology for the least cost to the taxpayer.

There are two ways of looking at this. The first is based on the concept of market transformation, which has been pioneered by the Consortium for Energy Efficiency, primarily a utility-based organization that has developed several successful programs, and by the United States Environmental Protection Agency and the Department of Energy. Market transformation programs focus on introducing new technologies that either do not exist in the market at all or occupy only a tiny niche. One of the barriers that market transformation programs seek to overcome is the lack of availability of these technologies and the high cost resulting from low production runs. This approach demands setting an ambitious but achievable target, and planning on co-funding a significant but not overwhelming market share. This is the approach taken in the current draft of the Bill.

Alternatively, from a revenue loss viewpoint, consider that the cost-effective investment in technologies for climate mitigation is on the order of $2 trillion over the next 30 years.[1] If tax credits provide only 20% of the incremental cost for 5 years, the cost of such tax credits would exceed $50 billion. This Bill proposes only

[1] *America's Energy Choices: Investing in a Strong Economy and a Clean Environment*, Alliance to Save Energy, American Council for an Energy-Efficient Economy, Natural Resources Defense Council, and Union of Concerned Scientists in consultation with the Tellus Institute. 1991.

a tenth that much. If it does not focus exclusively on the highest technologies, the budget impact targets will be grossly exceeded.

From a climate policy perspective, the impact of these tax credits will be relatively small, simply because of the size of the energy efficiency resource. If the Bill's goal is to maximize America's economic efficiency and competitiveness by encouraging cost-effective climate emissions reductions, the Bill would add a lower second tier for a wider variety of products, with commensurately lower tax credits. These could be funded by eliminating the deductibility of parking and by a small carbon emissions fee.

While the Bill is clearly on the right track for achieving its goal, several mid-course corrections could greatly improve its effectiveness, implementability, and verifiability. This paper discusses the mid-course corrections, focusing on the new buildings tax credit where the problems are most serious.

Section II describes why the current proposal for achieving 50% energy savings on heating, cooling, and hot water compared to the Model Energy Code (MEC) (now more appropriately referred to as the International Energy Conservation Code (IIEC)) is problematic because the MEC was designed as a prescriptive standard, and is weak in its ability to allow energy use or energy savings calculations.

Any percent-savings-from-MEC criterion could not be implemented – or even understood – without substantial additional regulations, including the need to make several decisions with important policy significance. This is a doable task, and a variant of it will be required in any event (see Section III). But the legislation must specify how this task will be accomplished in a timely fashion.

There is also the potential for perverse incentives whereby a builder's decision to qualify for tax credits could actually worsen the climate emissions problem rather than improve it. Section II illustrates this concern.

Section III provides NRDC's proposal, which is consistent in intent with the current language, but is more implementable. It also potentially could solve, or at least mitigate, disagreements between home builders, supported by the Alliance to Save Energy, and supporters of the current high threshold for tax credits.

Section IV elaborates a little more on the rationale for our proposal. Section V discusses some issues with the transportation sector incentives.

II. Implementation Problems with the New Housing Tax Credit

A. Prescriptive Standards vs. Performance Standards

The Model Energy Code (MEC) is a prescriptive standard: it specifies insulation levels and thermal properties of building components and requires certain installation techniques. It is easy to define compliance with the Model Energy Code, but it is problematic to define percentage improvements beyond the Code.

Calculating percentage improvements requires a performance approach rather than a prescriptive approach. A performance approach calculates the energy impact of decisions on building components. The MEC has provided increasingly detained guidance over the years on how to do such calculations, but even the 1998 Model Energy Code falls woefully short of being repeatable.[2]

Most of the national experience on energy codes for new housing is based exclusively on prescriptive compliance. California, however, initiated performance-based compliance on a massive scale in the 1980's, largely in response to the homebuilding industry (and without the opposition of any major faction.) Close to a million homes have complied with California's Title 24 standards on a performance basis.

This experience has pointed out a number of problems that would not necessarily be apparent from reading the text of the code. Many of these are still present in the MEC. Experience showed that builders and their consultants were extremely creative at finding loopholes in the rules for modeling energy use. This isn't hard to do, because simulation of energy use accurately requires hour-by-hour calculations for the full year, including the separate calculation of heating and cooling energy. Dozens, if not hundreds, of assumptions are necessary to do the calculation.

It is important to specify correctly the assumptions to be used both for modeling the reference house that defines code compliance and the proposed design, and rules on when these assumptions can vary between the two houses being simulated. California has evolved a detailed prescription on how to do this: it is referred to as "the Alternative Calculation Manual" (ACM), and runs over 400 pages with Appendices. It is essentially a standard for software to demonstrate compliance with the standard. Such

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[2] Repeatable means that two different analysts will get the same energy consumption result from analyzing the same house.

software could trivially be modified to include calculations of percent savings beyond the standard.

Field experience has shown that the results are repeatable and relatively tamper-proof. Such experience has also shown that the decisions on assumptions are valid, in that technologies that get credit for saving energy obtain an amount of credit that stakeholders in the Code process, including energy consultants, builders, environmental advocates, and building code officials find to be reasonable.

In order to provide the level of verifiability that I believe to be necessary for a tax credit, a similar process would have to be set up at the federal level. An initial proposal for doing this is presented in Section III below. The Department of Energy has attempted to do such a thing in developing voluntary rules for Home Energy Rating Services (HERS); this has led to paralysis due to a dispute between gas and electric interests. The proposal in Section III attempts to circumvent these political problems.

B. Treatment of Different Fuels

Most houses are heated by gas or oil and cooled by electricity. Nationally, water heating is about 60% gas and 40% electric. Thus, for the majority of houses, savings below MEC or any other target will have to be based on some methodology for comparing kilowatt hours of electricity with Btus of fossil fuel. This has been a source of great controversy in other proceedings.

In the MEC, the specification is to use "site energy," in which the Btu content of energy delivered is all that is considered. Thus, one kilowatt hour is defined as 3413 Btus. But for the case of climate mitigation tax credits, the solution should be pretty obviously be different: the criterion should be set in terms of kilograms of carbon emitted by the house.

Fuel selection makes an immense difference in climate impacts. Using the national average generation mix, which includes renewable, hydro, and nuclear plants whose output will not be affected by efficiency, 1 kWh of electricity produces 3.3 times the climate impacts of 3413 Btu of gas, without accounting for transmission losses. (See Section IV for the precise figures). For a worst reasonable case, but one typical of much of the country, 1 kWh of electricity produces over 5 times the climate emissions of 3413 Btu of natural gas. Emissions from oil are about 50% higher than those from an equivalent amount of gas.

An effort to define a climate goal without regard to fuel choice – that is, a climate goal that would encourage fuel switching – would place tremendous economic significance on the precise values of carbon emissions factors assigned to electricity vis-à-vis gas. As will be discussed in Section IV.A. below, decisions on how to count transmission losses, how to project marginal sources of electricity generation that will be avoided through efficient new buildings, and on whether to calculate emissions factors regionally or on national average make it politically problematic to select defensible exact values for carbon emissions factors.

When there is legitimate scientific uncertainty as well as political controversy over selecting exactly correct values for a parameter, it is better to find ways to avoid excess reliance on this parameter.[3] We believe that it can be established at an appropriate level if the consequences of a particular choice for that level are not too extreme.

This can be done by taking the philosophy of encouraging efficient use of whatever fuel the builder is choosing anyway. With this approach, the choice of emissions factors affects tradeoffs between different energy efficiency technologies, but does not influence the builder to choose one fuel over another. This is the approach that California has taken in its residential energy standards. It should be followed in this Bill, as illustrated in Section III, but it is crucial to avoid perverse incentives. Unfortunately, there are many in the Bill as it stands.

1. Inclusion of Water Heating

The current proposal calls for a 50% reduction from the MEC for heating, cooling, and water heating. Reducing heating and cooling

[3] From a pure climate protection point of view, the preferred policy option would most likely be to base the tax credit qualification level on the carbon emissions of a house with gas heating, and require an electric heated house to meet the same emissions level. Whether this presents a modest design problem or an insuperable barrier to obtaining tax credits for electrically-heated houses will depend on the choice of carbon emissions factors. For example, if we set the emissions factors at the national average levels described (but criticized) in Section IV.A., a minimum efficiency heat pump will have 28% higher emissions than a minimum efficiency gas furnace, assuming everything else is equal. This is a difference that can be overcome by selecting higher efficiency equipment or using additional energy efficiency measures. But, if we assume the worst reasonable case of carbon emissions factors, assuming coal is the avoided fuel for electricity generation, electric heat is at a 2.2:1 disadvantage, which will be difficult to overcome. At the opposite extreme, if we assume that electricity is supplied by high efficiency new gas-fired plants, a minimum efficiency electric heat pump would have a slight advantage compared to the base case gas house. Thus, the consequences of a plausible range of decisions on emissions factors are immense in terms of inter-fuel competition. Even a narrower, more realistic range of debate over emissions factors would have a large effect on fuel choice.

energy can be done by a variety of techniques, but the only technique currently recognized in any building code in the country is the substitution of more efficient water heaters. For gas water heaters, high technology equipment could cut energy use by about 35%-40%. For electricity, heat-pump water heaters or solar-assisted water heaters could cut energy use by 50%-75%. At present, heat-pump water heaters are likely to be less expensive than high-efficiency gas water heaters.

Thus, if water heating is included in the calculation, it is both easier to get credits for energy reductions and cheaper as well to start off with an electric water heater. This creates a dangerously perverse incentive. A tax-credit seeking builder would say that he was installing electric water heating in the base case in order to qualify for a credit of 50%-75% rather than merely 35%-40%.

The problem is that even a heat-pump water heater will be responsible for about 1.1 to 2.4 times the climate emissions of the highly efficient gas water heater.

2. Inclusion of HVAC equipment.

A similarly perverse incentive is created for space heating. A good heat pump will save more than 50% of the energy compared to electric resistance heating, whereas even an engine-driven gas heat pump will only save less than 40% compared to a conventional gas furnace. Again, it is easier to make savings starting with an electric fuel choice, but the resulting electric house will have higher climate emissions than the gas house.

C. Other Quirks in the MEC

The MEC standards for wall insulation and window characteristics are based on an assumed ratio of window area to wall area. Houses with less window area find it easier to comply with the MEC even though they are not more efficient. Houses with greater wall area, either by house designs that involve elaborate shapes or by the use of high ceilings, are allowed to have greater window area. These dependencies create variations in stringency with house design, and effectively, with house pricing levels, that do not always make sense.

The MEC was designed to address heating and not cooling, but at current levels of efficiency, cooling typically accounts for more climate emissions than heating (see Section IV). This leads to an insufficiently stringent requirement for areas with low heating loads but high cooling loads compared to other areas in the country. It also leads to a serious ambiguity concerning the extent to which cooling loads are modeled. Repeatable results will require that cooling loads be treated in a well-defined and consistent fashion.

III. Preliminary Outline of Our Proposal

This section contains NRDC's recommendation for the structure of a Bill that could address the problems described in Section II in a politically feasible and competitively fair fashion. Not that these proposals have not been reviewed widely, and so they may still contain some flaws. In particular, the table of specific requirements presented in Section III.B. is a first cut, with values that are illustrative of what might make sense, but which may have to be revised in many instances. Similarly, the structure of the table could be made more complex and detailed or simplified for the final introduced Bill, based on Administration or stakeholder input.

A. General Requirements to Obtain the Tax Credit

1. Limit the credit to heating and cooling energy use reduction technologies for the building envelope.

Water heating should be deleted from the requirements for the new housing tax credit because the only measure one can use to comply is the installation of a more efficient water heater, and this is already covered under the equipment tax credit section. New houses should be eligible for the equipment tax credits for water heaters in addition to whatever credits they earn for the building itself.

(This structure eliminates the perverse incentive for fuel switches to electricity and essentially says that whatever fuel the builder was intending to install in the first place, he can qualify for a tax credit.)

The energy savings credit from heating and cooling equipment should be eliminated for several reasons. First, experience in California, which I believe is corroborated by the EPA ENERGYSTAR

program, is that the first measure builders install to go beyond MEC is a 12 SEER air conditioner. This measures accounts for nearly 20% of the air-conditioner market and is not consistent with the high standard of performance being required for all other technologies.

If equipment efficiency were to be part of the tradeoff, assumptions would need to be made concerning the base case equipment. MEC is silent about equipment efficiencies other than saying that they have to comply with national appliance standards. Thus, to avoid perverse incentives to switch to electric resistance heat, which has lower first costs, assumptions would have to be made that a heat pump is required in an electric-heated home. Not only is this somewhat controversial, but it still provides larger credits for envelope measures to the more climate-polluting electric heat pump choice than to a comparable house with a gas furnace. Since insulation saves more heating than cooling, insulation measures will buy greater percentage reductions in the heat-pump house than in the gas house.

This creates an incentive to choose a heat pump over gas heating, when the reverse is better from a climate viewpoint.

Recommendation:

Provide credits for reductions in heating and cooling energy only, assuming a gas furnace and an electric air conditioner, whether or not those fuels are actually used.

Option A:

Assume that NAECA minimum efficiency equipment is installed regardless of the actual equipment efficiency levels.

Option B:

Require the installation of ENERGYSTAR-compliant equipment in order to qualify for the new housing tax credit. This would require eliminating tax credit eligibility for resistance heated houses (since there is no additional first cost to meeting a non-existent ENERGYSTAR specification for resistance heating). Electric-heated houses would require a heat pump to receive the tax credit.

In this option, the house would be modeled with a gas furnace and an electric air conditioner at the ENERGYSTAR levels, whether or not that sort of equipment was installed.

Discussion:

On the surface it seems counter-intuitive to assume a type of heating equipment that doesn't exist when one knows what actually does exist. But, this choice is necessary in order to create a level playing field between electricity and gas.

In general, in building codes there are two different ways of obtaining a level playing field. One is to require the same performance target regardless of the choice of fuels being made. This would set a carbon criterion based on the least carbon-intensive fuel, probably gas, and require other systems to jump over the same bar.

As discussed in Section II.B. above, the consequences of such a decision would be drastically different depending on which end of the plausible range of carbon emission factors for electricity was chosen. At one extreme, the least carbon-intensive fuel would be electricity, and gas heating would have to make up a slight (probably 10%) disadvantage. At the other end of the extreme, electric houses would have to make up a nearly 2:1 deficit compared to the carbon intensity of a gas furnace. Because of the immense variation in consequences that would flow from the selection of a particular level of emissions factor, the whole process could bog down in controversy. The potential for unintended consequences is high, even if the government is able to establish good emissions factors.

The other approach is to require the same tradeoffs be presented to the builder regardless of the choice of fuels. The only way to present the same tradeoffs regardless of fuels is to make a fixed assumption about fuel choice that is not dependent on any decision the builder makes.

2. Set component goals by heating and cooling climate in the legislation.

Once one recognizes the impossibility of defining percentages better than MEC, the simplest route to defining a level that qualifies for tax credits is simply to specify the measures. This can be done at various levels of complexity. A relatively simple example is presented in Section III.B.

While such an effort to essentially rewrite a code looks troublesome superficially, the MEC itself is not an intellectually self-consistent code, having been built up by accretion based on analyses dating back to the 1970's. The MEC is variably difficult to meet depending on climate, and has such anomalies as requiring no different standards for very hot climates with low heating loads such as Phoenix, and very cool climates with low heating loads such as San Diego.

This can be corrected easily. I believe that it will be easier to get stakeholders to agree to prescriptive qualification levels of each component of the building than to agree to a particular percent better than MEC. This approach will also lead to more predictable results in the field.

3. Offer a fixed $2,000 tax credit for all housing units over a minimum size – 500 sq. ft. as a strawman – for meeting either the component requirements or the equivalent climate emission performance as defined below.

This credit would be in addition to any credit that could be obtained from more efficient heating, cooling, or water-heating equipment. The reason for making the tax credit constant is primarily based on equity: to do otherwise would tilt the beneficiary class of the tax credit towards the upper-middle class unnecessarily.

4. Define equivalence rigorously.

A. Require DOE to promulgate calculational rules – standards for acceptable software – starting with the current California ACM (http://energy.ca.gov/98standards/documents/index.html#resacm) and looking also at HERS simulation rules.

B. Require EPA to establish carbon emissions per unit energy use to convert gas, oil, propane, electricity, and other relevant fuels to carbon equivalence for use in the calculations. For example, California defines the conversion between gas and other fossil fuels and electricity as 10,239 Btu/kWh. EPA should define grams of emission per Btu or kWh of energy use for each fuel in an appropriate fashion for this calculation

(See Section IV.A.)

C. Assume a gas furnace and an electric air conditioner at minimum NAECA efficiencies (or ENERGYSTAR levels)and assume the default duct efficiency in the ACM for the level of duct performance required to qualify for the tax credit.

The level of work required to define equivalence rigorously and to enforce the results as described below clearly is not trivial. But most of this intellectual effort has already been accomplished for the administration of the California standards. It would be a relatively trivial effort for the government to modify the ACM appropriately to take into account national concerns for tax credits as opposed to state level concerns for a building code. It would also be straightforward for commercial vendors of software to revise existing code compliance programs used in California and for MEC to comply with such a revised national ACM.

The experience in California provides a good basis for extrapolation nationwide in part because California's varied geography includes almost all of the climate types found throughout the country, from very cold snowy climates in the mountains to mild climates with and without cooling load. Essentially the only factor of national concern that is not addressed in the California work is the effect of high humidity on cooling.

5. Verification.

1. Plans.

The Title 24 standards require documentation to be submitted to the building department. This includes a limited number of summary forms and the plans for the building. Similar documentation should be made available to the IRS and to homeowner. The builder should certify as to its accuracy in a way that establishes legal responsibility for errors or omissions.

Note that the California ACM requires that the program itself produce easy-to-understand compliance forms as part of its output. There is a long and successful track record of using these software program outputs as the basis of compliance in California.

One additional issue is the question of who is qualified to run the software. In California, there is a trade association that sets voluntary certifications of qualified energy consultants. I believe that this trade association, CABEC, would prefer government regulation of the qualification of practitioners.

2. Field verification.

The applicant should provide permission for access to the property for random checks by inspectors.

In addition, several of the measures such as duct sealing and infiltration reduction require on-site testing. California ACM procedures should be followed for documentation of these field measurements.

B. Example of Component Standards

Each dwelling unit qualifying for a tax credit shall comply with the IECC (MEC) prescriptive requirements except that:

1. The fenestration requirements and insulation levels shall be determined by Table 1. U-factors for fenestration are to be determined in accordance with NFRC 100 and SHGC is to be determined in accordance with NFRC 200. U-factor and SHGC are to be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and are to be labeled and certified by the manufacturer.

TABLE 1

Climate	Fenestration Maximum U-Factor		Min. or Max. SHGC	Min. Ceiling R-Value	Min. Exterior Wall R-Value	Min. Floor R-Value	Min. Basement Wall R-Value	Min. Slab Perimeter R-Value & Depth	Min. Crawl Space Wall R-Value
	Vertical	Skylights or Sloped							
0-1999 HDD65[4] <6000 CDH74	.55	.65	.5 min.	R-30	R-15	R-19	R-8	R-5, 2 ft.	R-11
>6000 CDH74	.50	.60	.35 max.	R-38	R-19	R-19	R-8	R-5, 2 ft.	R-11
2000-3999 HDD65 <6000 CDH74	.40	.50	.5 min.	R-38	R-19	R-30	R-11	R-9, 2 ft.	R-19
>6000 CDH74	.35	.45	.35 max.	R-49	R-19	R-30	R-11	R-9, 2 ft.	R-19
4000-5999 HDD65	.30	.40	NR[5]	R-49	R-21	R-30	R-19	R-13, 4 ft.	R-25
6000-8499 HDD65	.25	.35	.3 min.	R-60	R-26	R-30	R-19	R-18, 4 ft.	R-25
8500-12999 HDD65	.20	.30	.3 min.	R-60	R-30	R-38	R-24	R-20, 4 ft.	R-30

2. Fenestration area shall be limited to 15% of the floor area or the actual fenestration area, whichever is lower.

3. Duct leakage, as determined by the California ACM procedures, shall be 6% based on diagnostic testing. If a system does not have ducts, the reference house shall include the 6% required level of duct loss, except for the case of electric resistance heating.

4. Infiltration shall be determined by blower door testing to be .33 air changes per hour (ach) for climates below 6000 HDD and a maximum of .15 for climates of 6000 HDD and above. If infiltration is lower than .33 ach, mechanical ventilation with heat recovery at 60% efficiency shall be provided to achieve .33 air changes per hour. If this infiltration requirement is not met, the California ACM's defaults shall be used for the proposed design in tradeoff calculations.

The MEC provides separate sets of prescriptive criteria for masonry buildings. We may need to develop an alternate set of wall insulation targets for masonry buildings.

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[4] HDD = heating degree days base 65°F
CDH74 = cooling degree hours base 74°F (available in ASHRAE Standard 90.2).

[5] NR = no requirement. The ACM defines default assumptions to use for tradeoffs.

C. Existing Houses

This structure can allow tax credits to be extended to existing homes, in two different ways. Such an extension makes sense because there is no good reason to distinguish between energy savings from new homes or existing ones if the technical measures are the same.

The first way to cover existing homes is simply to state that existing homes are eligible for the same tax credit as new homes if they achieve the same levels of performance. As for new homes, compliance could be demonstrated by component or by performance calculation. To qualify for the full tax credit of $2000, all components of the house would have to meet the specification.

A second approach is to allow a tax credit per square foot for each component (i.e., windows, ceiling insulation, leak sealing, wall insulation, etc.) for which the specification is met, up to a limit. Thus, if all windows were replaced with windows meeting the performance level required, the owner would qualify for the tax credit for windows. Such an approach truly allows existing houses to comply, but does so without any compromise in the technology level being incentivized.

Prorating the tax credit roughly by savings, we can propose the following language:

"Components in existing dwelling units that are upgraded to the levels specified in Table 1 shall be eligible for the following credits:"

Table 2

Component	Tax Credit in $/sf for each square foot of component upgraded to levels in Table 1	Maximum tax credit for this component per dwelling unit
Fenestration	$3.00/sf upgraded	$900
Opaque roof	$0.20/sf upgraded	$150
Opaque wall	$0.20/sf upgraded	$300
Opaque floor	$0.20/sf upgraded	$150
Duct Sealing	--	$250
Air Leakage Reduction	--	$250

IV. Additional Statements of Rationale for Building Code Proposals

A. Deriving Carbon Emissions Factors

One source of carbon emissions factors is the DOE/EIA EPAct Section 1605 reporting guidelines. Carbon emissions factors are established there as follows:

- Natural gas: 52.7 kg/MBtu
- Distillate fuel: 78.5 kg/MBtu
- Electricity, U.S. mean: 586 g/kWh

These values are used in the calculational example in Section B to examine what their policy impact would be.

These values are not necessarily the best choice for use in evaluating the climate emissions reductions that will result from more efficient new buildings. First, they do not include transmission losses. For the residential sector, including such losses would increase the electricity number by about 10% for losses on the electricity system. It might increase both the electric value and the natural gas value, and to a lesser the distillate fuel value for transmission and transportation losses of fuel from the source to the power plant or the home.

A more significant source of policy error is that the electricity number is obtained by dividing total carbon emissions from the electric sector by total electricity output from generating plants. Thus, sources of generation with no direct carbon impacts such as hydro, renewables, and nuclear, which account for almost 1/3 of U.S. generation, are not counted.

But the supply of these resources will be determined independently of the demand for electricity. That is, savings from new houses will not lead to any reductions in nuclear, hydro, or renewable generation. Instead, marginal changes in electricity demand will lead to marginal adjustments in the use of fossil fuels, particularly coal and gas. For coal-fired electricity, the emission factor at existing coal plants would be approximately 900 g/kWh. For new gas plants, the emission factor could be as low as 350 g/kWh, and for existing gas-fired plants, the value would be somewhere in between.

Selecting a figure that will accurately reflect climate emissions mitigation goals is complex. First, one has to predict the percentage of demand reductions that cause reductions in output from coal rather than gas-fired plants, distinguishing newer or higher efficiency plants from older or lower efficiency plants. This answer could vary regionally.[6]

More problematic is that the prediction depends on policy decisions that have yet to be made. Regional effects will be different in a restructured utility environment than they will be if the current regulatory environment for utilities is maintained. And the ratio of coal to gas could change as a result of climate policy.

For this reason, it is important to design the tax credit bill such that it does not have drastically different practical results if the emissions factor is the low end of the plausible range, or about the national average of 586

[6] EIA has projected marginal carbon emission factors for electricity in the range of 610-640 g/kWh at the power plant, or about 650-700 g/kWh after transmission losses.

g/kWh, or at the high end of the plausible range, or about 1,000 g/kWh. The policies described meet this criterion.

B. Examples of Different Ways to Add Gas and Electricity Use.

The errors incurred for climate policy by using MEC's site weighting scheme rather than carbon-emissions weighting can be illustrated by the following example. The numbers for heating, cooling, and water leaking are made up, but are in the ballpark of nationally typical values for heating, cooling, and hot water.

A base MEC house with gas heat and electric cooling will consume 40 MBtu of heat and 3,000 kWh of cooling. Gas water heater usage will be approximately 25 MBtu and electric 4,000 kWh.

For the purpose of this comparison, we will first assume that the emission factor for gas is 52.7 kg/MBtu and for electricity is 1 kg/kWh, assuming coal-fired generation and 10% transmission losses. This is a worst reasonable case, but not atypical of much of the country.

The gas heating/electric cooling only MEC case has emissions of 65 MBtu x 52.7 kgC/MBtu + 3000 kWh x 1kgC/kWh = 6425 kgC. The electric base case, assuming an electric resistance furnace instead of a gas furnace at national minimum efficiency of 78% uses (40 MBtu x .78/3413+ 3000 kWh + 4000 kWh) 1 kgC/kWh = 16,141 kgC. Thus, the 50%-below-MEC all electric house creates as much as 25% more climate emissions than the base-case gas/electric house.

Repeating the calculation for the national average emission factor of 586 g/kWh, the gas/electric house has carbon emissions of 65 MBtu x 52.7 kgC/MBtu + 3,000 kWh x .586 kgC/kWh = 5183 kgC. For the all-electric base case, the emissions are (40 MBtu x .78/3413 + 3,000 kWh + 4,000 kWh) x .586kgC/kWh = 9459 kgC.

Using this calculational metric, the electric house requires 45% savings below MEC merely to equal the base case MEC-compliant gas/electric house.

The same example illustrates how site energy can provide the wrong guidance for climate policy. The all-electric house in this case consumes 31.8 MBtu + (4000 kWh + 3000 kWh) x 3413 Btu/kWh = 55.7 MBtu of site energy.

This is in comparison to the gas/electric house, which uses (45 MBtu + 25 MBtu + 3000 x 3413 Btu/kWh = 75 MBtu.

This illustrative calculation shows the immense difference in the results of an MEC-style site weighting energy calculation compared to a climate emissions calculation.

The site calculation shows the gas/electric MEC house using 35% more energy than the all-electric house, both at MEC compliance, whereas the climate impacts of the all-electric case range between about 80% to 150% higher.

V. Automotive Sector

A. The Criteria Should be In Grams Carbon Emissions per Mile for the Complete Fuel Cycle rather than Miles per Gallon.

Miles per gallon is an appropriate criterion if the technologies in question all use gasoline. For alternative fuels, if we want to create a level playing field based for fuel technologies, we should define the criterion in terms of climate impact. This metric should also help in global competitiveness, because other countries are likely to be designing their automotive sectors around minimizing climate emissions as well.

B. The Vehicles Complying for the Tax Credit Should also Comply with Air Quality Criteria, such as California's SULEV Criterion.

There are good environmental reasons for this requirement, both from a substantive and a political consensus point of view.

But even it there weren't, the reality is that tighter emission standards will certainly be in effect in California by 2004 and could well be in effect in the rest of the United States. It is easier for equipment designers to optimize for two criteria at once than to address each of them separately. This was clearly demonstrated for refrigerators and commercial air conditioners when the dual goals were phase-out of ozone depleters and improvement of energy efficiency. Optimizing for both objectives at once was cheaper and more effective. If we know that the industry will be required to move in a certain direction on clean air, we should encourage that same direction through market transformation programs.

Finally, this tax credit will incentivize only a tiny fraction of the automobile fleet due to its limited financial resources. We cannot afford to exclude at least 15% of the market, and probably more, from the potential for purchasing products that qualify for a tax credit.

C. *There is No Rationale for Using Acceleration as a Criterion for Fuel Economy*

The current proposal asks EPA to define classes of vehicle acceleration for comparison of fuel economy. Beyond the performance of a typical family car, we can see no public policy justification for allowing higher climate emissions for higher acceleration. Unlike vehicle size, there is no practical function that acceleration serves. High acceleration vehicles are, I believe, correlated with high traffic accident rates.

We're set for Wednesday at 1:00 if you are still free then. I think we should meet in Phil B's office - B350 RHOB. I'm not sure what cafeteria is open but we can forrage from over there.
I'm out of the office tomorrow, 12/1 but will check messages.
Thanks Dan.
Alys
Received: from iodine.house.gov ([137.18.128.25]) by mail.nrdc.org with SMTP (IMA Internet Exchange 3.11) id 0002E860; Mon, 30 Nov 1998 14:05:43 -0500
Received: from msg12.house.gov (msg12.house.gov [143.231.207.208])
by iodine.house.gov (8.9.1/8.9.1) with SMTP id OAA54900
for <dlashof@nrdc.org>; Mon, 30 Nov 1998 14:02:30 -0500
Received: by msg12.house.gov with SMTP (Microsoft Exchange Server Internet Mail
Connector Version 4.0.996.62)
id <01BE1C6A.75B7E650@msg12.house.gov>; Mon, 30 Nov 1998 14:05:18 -0500
Message-ID:
<c=US%a=_%p=U.S._House_of_Re%l=MSG12-981130190516Z-3823@msg12.house.gov>
From: "Campaigne, Alys" <Alys.Campaigne@mail.house.gov>
To: "'Dan Lashof - NRDC'" <dlashof@nrdc.org>
Subject: Wednesday
Date: Mon, 30 Nov 1998 14:05:16 -0500
X-Mailer: Microsoft Exchange Server Internet Mail Connector Version 4.0.996.62
Encoding: 6 TEXT

DATE: December 18, 1998
TO: Interagency Tax Credit Team
FROM: Housing Tax Credit Coalition
RE: Revisions to Administration Climate Change Tax Package

As a coalition of homebuilders, energy-efficiency advocates, manufacturers of energy-efficient building products and technologies, and others, we were gratified to learn that your tax credit package is being re-evaluated for reintroduction in the 106th Congress. Every day, we face the market obstacles to increasing energy-efficiency in housing. We propose housing tax credits that we know will result in the construction of energy-efficient new homes, and that will achieve even larger savings in existing homes. We are ready to work hard for the passage of a proposal we can strongly support.

We supported the inclusion of a tax credit for the purchase of highly efficient new homes in the package that ultimately became H.R. 4538, introduced in the 105th Congress by Rep. Robert Matsui. That proposal required that, to qualify for the credit, new homes would have to be 50 percent more efficient than the Model Energy Code. We strongly believe that this sets a standard so high that it would fail to attract the interest of the average homebuilder, would result in the construction of only a handful of showcase homes, and make little or no progress toward improving the energy-efficiency of the nation's housing stock. Our proposal for new homes was initially set out in H.R. 4626, introduced by senior Ways and Means member Rep. Bill Thomas and expected to be reintroduced early next year. We are currently working with his office to refine and improve the proposal.

In addition, we strongly believe that a performance-based credit for upgrading the energy-efficiency of existing homes is necessary to make a significant dent in the energy use of our nation's housing stock. While we support a new home credit, only 1.2 million new homes are built every year. This leaves 100 million owners of existing, largely energy-inefficient homes with no impetus to upgrade—and wastes much more energy than increasing the efficiency of new homes would save. Though upgrading the energy-efficiency of existing homes is a huge task, we believe that a tax credit can be designed which maximizes energy-efficiency gains while minimizing federal expenditures.

We submit these recommendations to you in hopes that they be adopted for the upcoming package:

I. NEW HOME CREDIT: The Qualification Standard Must Be More Achievable

The requirement for the new home credit must be more accessible for builders and buyers. Setting the standard at 50 percent above the Model Energy Code might save a lot of energy per home, but will enable only a small number of homes to qualify for the credit. We know from experience that a standard set at 30 percent above the reference code saves, while it saves a little less energy per home, will save more energy overall because more homes will qualify. The 50 percent standard puts the credit out of reach for all but the most wealthy homebuyers in the mildest climates, while the 30 percent standard makes it possible for builders and buyers in all areas of the country to participate. Using a more achievable standard will have a much wider-reaching and longer-lasting effect on our nation's housing markets, and will save more energy.

Credit Level

We agree with last year's proposal that a credit with a $2000 cap is of the appropriate size to attract the interest of both builders and buyers. However, we believe that credit should be flat, not ramped down for lower-cost houses. A flat credit guarantees that energy-efficiency will receive the same or more attention from the builders of lower-cost homes as it will from the higher-end market. This approach would give the credit a much greater impact on housing affordability and home ownership rates. While a percentage-based credit will reduce federal expenditures by a small amount, it will attract fewer builders to construct energy-efficient homes.

The Homebuilder Should Receive the Credit

In order for homebuyers to purchase energy-efficient homes under a tax incentive scheme, the tax incentive must focus on getting the house built. For this reason, we support designing the new home tax credit to go directly to the homebuilder, who can then pass it on to the buyer at closing. Builders must be attracted to this proposal, or the highly energy-efficient homes will not constructed in significant numbers.

A builder credit will get the attention of the industry, educating homebuilders not only to an additional sales incentive, but also to the ease and advantage of using existing technology to increase energy–efficiency. If the builders can effectively use the credit to sell homes, they will develop sophisticated and effective marketing strategies to carry it out, thus educating the consumer in a way that cannot be achieved by the government.

Use the 1998 International Energy Conservation Code (IECC)

H.R. 4538, the Matsui bill, references the 1993 Model Energy Code. We believe that this program is better served by using the 1998 International Energy Conservation Code. Upgrades made in the code since 1993 have increased the energy savings obtainable from the code, and have also helped balance criteria for heating and cooling climates. Using the 1998 IECC as the reference for the credit thus saves more energy, and also reduces the likelihood that one region will have an advantage over another.

II. EXISTING HOME CREDIT

We know from the experience of energy efficiency programs that the energy savings available in existing homes can far outstrip those from new homes for energy savings and carbon emission reductions. We propose that a homeowner who upgrades the energy-efficiency of his or her house by 30 percent receive a credit of 50% of the cost of the project, up to $2000. Qualification for such an incentive requires a major effort on the part of a homeowner, with the credit forming a much smaller percentage of the additional marginal cost of the upgrade than with the new home credit.

We realize that a great many details for this proposal must yet be worked out, and stand ready to assist the appropriate departments to forge a proposal which can get at the greatest potential for energy savings in housing which lies in existing homes.

Please contact Dave Hamilton at the Alliance to Save Energy 202/530-2216, or Tammy Eddy at the national Association of Homebuilders 202/822-0470 for more information.

AGENDA FOR MEETING ON HOUSING TAX CREDITS

12/18/98

AGENDA

I. Introductions --

II. Review of last years proposal and politics -- David Nemtzow

III. View from the White House –

IV. Our New Home Proposal.

A. Ron Burton -- 30 percent vs. 50 percent - very difficult in north climate
B. Dave Hamilton -- Builder vs. buyer credit - good track record (40%)
C. Garrett Stone or Bill Prindle -- IE - may accept - at the end of day, means less homes.

V. Existing Home Proposal

A. George Phelps -- Whole home/performance standard
B. Jared Blum -- Politics of existing homes

VI. Additional Discussion

Percentage
- 1998 code - gets you more efficiency. 10% more efficient in the South.
- Align Energy star w/ this credit. Enhances energy star.
- Hard to embrace anything beyond 30% - Ken.

105TH CONGRESS
2D SESSION

H. R. 4626

To amend the Internal Revenue Code of 1986 to provide individuals a credit against income tax for the purchase of a new energy efficient affordable home and of energy efficiency improvements to an existing home.

IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 24, 1998

Mr. THOMAS introduced the following bill; which was referred to the Committee on Ways and Means

---

A BILL

To amend the Internal Revenue Code of 1986 to provide individuals a credit against income tax for the purchase of a new energy efficient affordable home and of energy efficiency improvements to an existing home.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Energy Efficient Affordable Home Act of 1998".

SEC. 2. CREDIT FOR PURCHASE OF NEW ENERGY EFFICIENT HOME AND OF ENERGY EFFICIENCY IMPROVEMENTS TO EXISTING HOMES.

(a) IN GENERAL.—Subpart A of part IV of subchapter A of chapter 1 of the Internal Revenue Code of 1986 (relating to nonrefundable personal credits) is amended by inserting after section 25A the following new section:

"SEC. 25B. PURCHASE OF NEW ENERGY EFFICIENT HOME AND OF ENERGY EFFICIENCY IMPROVEMENTS TO EXISTING HOMES.

"(a) ALLOWANCE OF CREDIT.—In the case of an individual, there shall be allowed as a credit against the tax imposed by this chapter for the taxable year an amount equal to—

"(1) the purchase price of each new energy efficient dwelling purchased by the taxpayer during the taxable year, and

"(2) 20 percent of the cost paid or incurred by the taxpayer for qualified energy efficiency improvements installed during such taxable year.

"(b) LIMITATIONS.—

"(1) MAXIMUM CREDIT.—The credit allowed by this section with respect to a dwelling shall not exceed $2,000.

"(2) PRIOR CREDIT AMOUNTS FOR TAXPAYER ON SAME DWELLING TAKEN INTO ACCOUNT.—If a credit was allowed to the taxpayer under subsection (a) with respect to a dwelling in 1 or more prior taxable years, the amount of the credit otherwise allowable for the taxable year with respect to that dwelling shall ~~not exceed the amount~~ of $2,000 reduced by the sum of the credits allowed under subsection (a) to the taxpayer with respect to the dwelling for all prior taxable years.

"(c) CARRYFORWARD OF UNUSED CREDIT.—If the credit allowable under subsection (a) exceeds the limitation imposed by section 26(a) for such taxable year reduced by the sum of the credits allowable under subpart A of part IV of subchapter A (other than this section), such excess shall be carried to the succeeding taxable year and added to the credit allowable under subsection (a) for such taxable year.

"(d) DEFINITIONS.—For purposes of this section—

"(1) NEW ENERGY EFFICIENT DWELLING.—The term 'new energy efficient dwelling' means a dwelling—

"(A) located in the United States,

"(B) owned and used by the taxpayer as the taxpayer's principal residence (within the meaning of section 121),

"(C) the construction of which is substantially completed after December 31, 1998,

"(D) the original use of which commences with ~~the taxpayer~~, and

"(E) which is certified to exceed by 30 percent or more the applicable standards for energy efficiency based upon energy use or building component performance established for comparable dwellings under the applicable Model Energy Code (promulgated by the Council of American Building Officials) or to exceed such alternative standards for energy efficiency as the Secretary may prescribe in consultation with the Secretary of Energy.

"(2) PURCHASE PRICE.—The term 'purchase price' means the adjusted basis of the dwelling on the date of its acquisition by the taxpayer.

"(3) QUALIFIED ENERGY EFFICIENCY IMPROVEMENTS.—The term 'qualified energy efficiency improvements' means any energy efficient building envelope component, and any high energy efficiency heating or cooling appliance, if—

"(A) such component or appliance is installed in or on a dwelling—

"(i) located in the United States, and

"(ii) owned and used by the taxpayer as the taxpayer's principal residence (within the meaning of section 121),

"(B) the original use of such component or appliance commences with the taxpayer, and

"(C) such component or appliance reasonably can be expected to remain in use for at least 5 years.

"(4) ENERGY EFFICIENT BUILDING ENVELOPE COMPONENT.—The term 'energy efficient building envelope component' means—

"(A) insulation material which is specifically and primarily designed to reduce, when installed in or on a dwelling, the heat loss or gain of such dwelling,

"(B) exterior windows that are certified to equal or exceed the applicable standards for energy efficiency (as determined by the National Fenestration Rating Council or similar body), and

"(C) such other components of the building envelope as the Secretary may prescribe in consultation with the Secretary of Energy.

"(5) HIGH ENERGY EFFICIENCY HEATING OR COOLING APPLIANCE.—The term 'high energy efficiency heating or cooling appliance' means mechanical heating or cooling equipment (including a hot water heater) which is certified by the manufacturer as having an energy efficiency rating that equals or exceeds 150 percent of the applicable minimum energy efficiency standard established under the National Appliance Energy Conservation Act of 1987 (Public Law 100–12).

"(e) CERTIFICATION.—

"(1) NEW DWELLING CERTIFICATIONS.—A certification described in subsection (d)(1)(E) with respect to a dwelling shall be made by the person who constructed the dwelling or by a local building regulatory authority.

"(2) WINDOWS.—A certification described in subsection (d)(4)(B) with respect to a window shall be made by the person who sold or installed the window.

"(3) FORM OF CERTIFICATIONS.—Certifications referred to in this subsection shall be in such form

as the Secretary shall prescribe, and, except in the case of a certification by a representative of a local building regulatory authority, shall include the taxpayer identification number of the person making the certification.

"(f) SPECIAL RULES.—

"(1) TENANT-STOCKHOLDER IN COOPERATIVE HOUSING CORPORATION.—In the case of an individual who is a tenant-stockholder (as defined in section 216) in a cooperative housing corporation (as defined in such section), such individual shall be treated as having paid his tenant-stockholder's proportionate share (as defined in section 216(b)(3)) of the cost of qualified energy efficiency improvements made by such corporation.

"(2) CONDOMINIUMS.—

"(A) IN GENERAL.—In the case of an individual who is a member of a condominium management association with respect to a condominium which he owns, such individual shall be treated as having paid his proportionate share of the cost of qualified energy efficiency improvements made by such association.

"(B) CONDOMINIUM MANAGEMENT ASSOCIATION.—For purposes of this paragraph, the

term 'condominium management association' means an organization which meets the requirements of paragraph (1) of section 528(c) (other than subparagraph (E) thereof) with respect to a condominium project substantially all of the units of which are used as residences.

"(g) BASIS ADJUSTMENT.—For purposes of this subtitle, if a credit is allowed under this section for any expenditure with respect to any property, the increase in the basis of such property which would (but for this subsection) result from such expenditure shall be reduced by the amount of the credit so allowed.

"(h) EFFECTIVE DATE.—Subsection (a)(1) shall apply to dwellings purchased during the period beginning on January 1, 1999, and ending on December 31, 2003, and subsection (a)(2) shall apply to qualified energy efficiency improvements installed during such period.".

(b) CONFORMING AMENDMENTS.—

(1) Subsection (c) of section 23 of such Code is amended by inserting ", section 25B, and section 1400C" after "other than this section".

(2) Subparagraph (C) of section 25(e)(1) of such Code is amended by striking "section 23" and inserting "sections 23, 25B, and 1400C".

(3) Subsection (d) of section 1400C of such Code is amended by inserting "and section 25B" after "other than this section".

(4) Subsection (a) of section 1016 of such Code is amended by striking "and" at the end of paragraph (26), by striking the period at the end of paragraph (27) and inserting "; and", and by adding at the end the following new paragraph:

"(28) to the extent provided in section 25B(g), in the case of amounts with respect to which a credit has been allowed under section 25B.".

(5) The table of sections for subpart A of part IV of subchapter A of chapter 1 of such Code is amended by inserting after the item relating to section 25A the following new item:

"Sec. 25B. Purchase of new energy efficient home and of energy efficiency improvements to existing homes.".

(c) EFFECTIVE DATE.—The amendments made by this section shall apply to taxable years ending after December 31, 1998.

○

Fax to
Julie Anderson

MEMORANDUM

To: Gerry Gerardi (Geraldine.Gerardi@treas.sprint.com)
Fax: (202) 622-1782

From: David B. Goldstein

Date: March 4, 1999

Re: Specific Suggestions for Legislative Language for the Administration's Housing Energy Efficiency Tax Credit Proposal.

This memo responds to your request at our meeting of 2 March 1999 for specific language implementing NRDC's suggestions to rely on prescriptive or component standards for qualification for the tax credit along with a well-defined tradeoff procedure to be established through regulations. My starting point is the Matsui Bill of last year, H.R. 4538. I am not a lawyer, so the proposal below is not fully consistent with the requirements of legislative language, but I hope it is close enough to allow such drafting.

Note that the proposal contained below defines only one tier of qualification for the tax credits, in contrast to the three tiers being proposed by the Administration. We would have to develop what the other tiers are, either by changing the entries in the table, or by deleting or softening the other component requirements of (6)(D)(i).

I am working on the assumption, based only on my intuition, that the proposal I am making corresponds to the "50%" tier. Thus, I expect that prescriptive requirements for the other tiers would be milder. This is something we can work out with EPA and DOE.

The proposed language is as follows:

(6) New Highly Energy-Efficient Principal Residence

(A) In general - Property is a new highly energy-efficient principal residence if:

(i) [no change]

(ii) Such property:

I. Meets the requirements for energy efficiency provided either in

(http://www.energy.ca.gov/98standards/documents/ index.html#resacm).

7. The Secretary of Energy may certify alternative component requirements that are equivalent to Sections 1-6 and allow a house to qualify as energy efficient.

(ii) [A house may qualify for tax credits using the whole building approach rather than the component approach if the carbon dioxide emissions calculated for the house for heating and cooling are equal to or less than the emissions for heating and cooling that would have resulted from a house that meets the requirements in Section (i) above. Procedures for calculating such equivalence shall be promulgated by the Secretary of Energy, after having examined the 1999 California ACM manual, and shall meet the following requirements.]

1. Certification - the calculations shall be prepared by qualified computer software that prints the IRS compliance forms directly. If a builder or an agent of the builder is preparing qualifying documents, a report to the home owner shall be prepared that summarizes the energy efficiency features of the building, including all features mentioned in Section (i) above, and the builder shall certify to IRS that such documents have been made available to the homeowner.

2. In calculating tradeoffs, the Secretary shall rely on carbon dioxide emission factors per unit of energy, such as kilowatt hour, gallon of fuel oil, and cubic foot or Btu of natural gas, developed by the Administrator of the Environmental Protection Agency.

3. In performing calculations, the house shall be assumed to rely on a gas forced air furnace with an AFUE of 90% and an electric central air conditioning system with an SEER of 12.0 for both the reference house and the proposed design regardless of the actual equipment or fuel choices proposed for installation and regardless of whether central heating or cooling equipment is actually installed. Duct efficiency shall be assumed at the default levels in the methodology prescribed by the Secretary of Energy for the level of duct performance required in Section (i)(3) above.

a. Exception. For houses heated by electric resistance, the reference house shall be modeled as using an electric heat pump that meets the specifications established by the Energy Star program of the Environmental Protection Agency and the Department of Energy in effect on March 1, 1999. The proposed design shall be modeled as using the heating system actually installed and a cooling system based on an electric air

Climate	Maximum U-Factor		Min. or Max.	Ceiling	Wall		Wall	Perimeter	Space Wall
	Vertical	Skylights or Sloped	SHGC	U-Value	U-Value	U-Value	R-Value	R-Value & Depth	R-Value
0-1999 HDD65 <6000 CDH74	.55	.65	.5 min.	.034	.081	.037	R-8	R-5, 2 ft.	R-11
>6000 CDH74	.50	.60	.35 max.	.028	.062	.037	R-8	R-5, 2 ft.	R-11
2000-3999 HDD65 <6000 CDH74	.40	.50	.5 min	.028	.062	.028	R-11	R-9, 2 ft.	R-19
>6000 CDH74	.35	.45	.35 max.	.021	.062	.028	R-11	R-9, 2 ft.	R-19
4000-5999 HDD65	.30	.40	NR	.021	.056	.028	R-19	R-13, 4 ft.	R-25
6000-8499 HDD65	.25	.35	.3 min.	.0175	.042	.028	R-19	R-18, 4 ft.	R-25
8500-12999 HDD65	.20	.30	.3 min.	.0175	.036	.023	R-24	R-20, 4 ft.	R-30

2. Fenestration area shall be limited to 15% of the floor area.

3. Duct leakage, as determined by the test protocols established by the Secretary of Energy, (see Section 6 below) shall be no greater than 6% of total air supply flow based on diagnostic testing. If the Secretary has not established such requirements by December 31, 1999, testing shall be in accordance with ASTM E1554-94 until the Secretary establishes other requirements.

4. Infiltration shall not exceed .33 air changes per hour (ach) for climates below 6000 HDD and .15 ach for climates of 6000 HDD and above when tested in accordance with ASTM E1827-96 or E741-95, or with procedures prescribed by the Secretary of Energy. If infiltration is lower than .33 ach, mechanical ventilation with heat recovery at 60% efficiency shall be provided to achieve .33 air changes per hour.

5. Heating and cooling equipment shall meet the specifications established by the Energy Star program of the Environmental Protection Agency and the Department of Energy in effect on March 1st, 1999 for electricity, gas, and oil heating.

6. Test protocols for measuring air infiltration and duct leakage on site and for determining levels of insulation shall be established by the Department of Energy after consulting the test protocols cited above and the California "Residential ACM Manual" published by the California Energy Commission in 1999

section (D)(i) or (D)(ii).

II. [Same as existing]

[I believe it would be preferable to fix the tax credit at $2,000 per house to provide more fairness for low and moderate income people]

(B) Certification [Insert the following language after the existing section: The Secretary of Energy shall establish requirements for certification after examining the requirements for energy consultants and home energy ratings providers specified by the Mortgage Industry National Accreditation Procedures for Home Energy Rating Systems. All certifications shall be conveyed to the homeowner claiming the tax credit as well as to the Secretary.]

(D) Requirements for an Energy-Efficient House

(i) Component Approach - [a house qualifies for the tax credit if it meets all of the requirements below for every component of the building that is listed below.]

Each dwelling unit qualifying for a tax credit shall:

A) Comply with the applicable state energy code provided it has been certified to the Secretary of Energy as meeting or exceeding the 1995 Model Energy Code; or

B) If a state does not have a qualifying energy code, each dwelling unit qualifying for a tax credit shall comply with the IECC 1998 prescriptive requirements.

In addition to meeting (A) or (B) above, each dwelling unit shall meet the following:

1. The fenestration requirements and insulation levels shall be determined by Table 1. U-factors for fenestration are to be determined in accordance with NFRC 100 and SHGC is to be determined in accordance with NFRC 200. U-factor and SHGC are to be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and are to be labeled and certified by the manufacturer.

TABLE 1

	Fenestration	Max.	Max. Exterior	Max. Floor	Min. Basement	Min. Slab	Min. Crawl

conditioner with an SEER of 12.0.

4. Except as provided in Section 3a above, installed heating and cooling equipment shall meet the specifications established by the Energy Star program of the Environmental Protection Agency and the Department of Energy in effect on March 1st, 1999 for electricity, gas, and oil heating.

5. Fenestration area shall be limited to 15% of the floor area or the actual fenestration area, whichever is lower.

[However, if the equipment efficiencies meet or exceed the levels specified in Section ___ (Equipment Efficiency Tax Credits' Section), such pieces of equipment shall qualify for tax credits independently of and in addition to the building.]

[I did not know what the status was of Administration consideration of extending the tax credit to existing housing as well as new housing. If this is of interest, I have attached the following language that could implement such an extension.]

(7) [New Section] Energy Efficiency Improvements to Existing Principal Residence

(A) In General - [Tax credits are available for improvements in energy efficiency that meet the criteria in Section 6(D)(i). The maximum tax credit available by component shall be:

Fenestration Systems	$3/sq. ft. of new fenestration system, or $900, whichever is less.
Opaque Roof	20▒/sq. ft. of insulation added, or $150, whichever is less.
Opaque Wall	20▒/sq. ft. of insulation added, or $300, whichever is less.
Opaque Floor	20▒/sq. ft. of insulation added, or $150, whichever is less.
Duct Sealing	$250
Air Leakage Reduction	$250

DEPARTMENT OF THE TREASURY
OFFICE OF TAX POLCY
OFFICE OF TAX ANALYSIS
INTERNATIONAL TAX ANALYSIS
1500 PENNSYLVANIA AVENUE, NW
WASHINGTON, DC. 20220

NUMBER OF PAGES 6 DATE 3-8-99

TO Julie Anderson 395-2342 395-2332
Name Fax No. Confirmation No.

FROM Jerry Gerardi 622-1782
Name Phone No.

Sender's FAX No. 202-622-2969 Location: Room 4225

Sender's Confirmation No.

Comments/Special Instructions

UNCLASSIFIED

40 Washington Street
Westborough, MA 01581

508.836.9500 tel
508.836.3181 fax

CSG

Conservation Services Group

October 5, 1999

President Clinton
The White House
1600 Pennsylvania Ave.
Washington, D.C. 20500

Dear President Clinton,

I am writing in support of targeted tax credits for energy efficiency. I urge you to make energy efficiency tax credits a top priority in your negotiations with Congress over the tax and budget issues for FY 2000, and to support H.R. 2380.

Energy efficiency technologies are the best way of solving a number of pressing economic and geopolitical problems, as well as reducing pollution emissions. They offer the prospect of enhancing economic growth, creating more jobs, reducing our nations growing dependence on imported oil, cutting energy prices through slackened demand, as well as cutting emissions of greenhouse pollution and health-related air pollution.

Over 30 years of experience has shown that targeted incentives that are offered for several years can encourage the introduction of significantly-advanced technologies that would not otherwise have made it into the marketplace. By facilitating mass production and introduction of these technologies, their cost is driven down, and they can survive with reduced or eliminated policy interventions in the future. These successes in market transformation would create product availability leveraged by federal tax dollars, with maximum public benefit obtained for the minimum tax revenue loss.

Representative Matsui's "Energy Efficient Technology Tax Act" (H.R. 2380), represents a strong starting position. By including tax credits for upgrading the energy efficiency of existing homes and encouraging the construction of highly-efficient new homes, public policy can have a positive impact on many Americans while supporting local economies and helping the environment at the same time. A nationally accredited system of home energy ratings has been expanding for the last several years; as long as the energy improvements are documented by an accredited home energy rating, the Treasury Department can be assured that the government's investment is sound and the energy savings reliable.

We are hopeful that you can support energy efficiency tax credits in the current budget proceedings.

Sincerely,

Bruce Harley
Stamford, VT
Engineering Project Manager

Bcc: Julie Anderson

40 Washington Street
Westborough, MA 01581

508.836.9500 tel
508.836.3181 fax

CSG

Conservation Services Group

October 5, 1999

Vice President Gore
The White House
1600 Pennsylvania Ave.
Washington, D.C. 20500

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Engineering Project Manager

Bcc: Julie Anderson