

## Clean Tax Cuts for Commercial Real Estate

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Discussion Paper

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## Abstract

Congress is likely to consider federal tax reform in 2017 and many new ideas may be considered. One such new idea is clean tax cuts – the application of supply-side tax rate cuts to “clean” decarbonizing investments. The idea is that by cutting tax rates for income from clean investments (where “clean” is specifically defined), investors will be more interested in making such investments, and large amounts of private capital can be leveraged.

Clean tax cuts can potentially work in a wide variety of applications but might be particularly influential in markets where investment returns are passed on to individuals and included on individual tax returns. Commercial real estate (including multifamily housing) is such a market, where individuals often invest in Real Estate Investment Trusts (REITs), limited liability corporations (LLCs) and limited liability partnerships (LLPs). In all of these structures, the returns (or losses) are passed on to the investors for inclusion on their personal income taxes. Most of these investors have substantial net worth and are interested in low tax rates, which is why we see investments made by individual investors as a prime target. Thus, commercial real estate could be an excellent place to begin the clean tax cut concept with a focus on individual investors.

In this discussion paper we provide some background information on commercial buildings, commercial real estate structures and opportunities for additional energy improvements. We then outline a straw proposal for clean tax cuts for commercial real estate. This proposal involves providing a lower tax rate (the long-term capital gains rate) for income from buildings that are Energy Star certified. A variety of other options and questions are raised for discussion at a forthcoming workshop on the topic of clean tax cuts for commercial real estate.

## Introduction: Tax Reform and Clean Tax Cuts

Federal income taxes last went through a major reform in 1986. Pressure has been building for a new tax reform effort and President Trump, House Speaker Paul Ryan, and Senate Majority Leader Mitch McConnell are all on record as wanting a major tax reform bill enacted this year. While the focus of tax reform is likely to be on simplification of the tax code and reducing marginal tax rates, other major policy objectives will also be part of the conversation such as spurring economic development and job creation.

In this context, many new ideas are being considered. For example, a new tax policy paradigm, put forward by House Republicans, is challenging traditional thinking. It would allow expensing of most investments, do away with the deduction for interest expenses, not tax foreign income of US corporations, not tax income related to exports and include a border tax adjustment for imports (see RER 2017). There appears to be room for other new ideas. One such idea that could get consideration is clean tax cuts – the application of supply-side tax rate cuts to “clean” decarbonizing investments. The idea is that by cutting tax rates for income from clean investments (where “clean” is specifically defined), investors will be more interested in making such investments, and large amounts of private capital can be leveraged.

The Grace Richardson Fund, Rocky Mountain Institute and others have developed and pioneered the concept of clean tax cuts (see for example Blades 2015 and GRF 2016). For example, clean tax cuts can be used to provide lower tax rates for income from energy efficient buildings (e.g., Energy Star certified). The tax cut might spur building owners to make efficiency improvements in order to qualify for the lower tax rate.

Clean tax cuts can potentially work in a wide variety of applications but might be particularly influential in markets where investment returns are passed on to individuals and included on individual tax returns. Commercial real estate (including multifamily buildings) is such a market, where individuals often invest in Real Estate Investment Trusts (REITs), limited liability corporations (LLCs) and limited liability partnerships (LLPs). In all of these structures, the returns (or losses) are passed on to the investors for inclusion on their personal income taxes. Most of these investors have substantial net worth and are interested in low tax rates, which is why we see investments made by individual investors as a prime target (corporations also want lower taxes, but in 2010, the average effective corporate federal income tax rate was 12.6% for profitable companies [GAO 2013]; corporate taxes have declined over time as companies take advantage of various provisions in the tax code to reduce their taxes). Thus, commercial real estate could be an excellent place to begin the clean tax cut concept with a focus on individual investors. This said, we recognize that commercial real estate comes in many “flavors” and any proposal will need to recognize the diversity of entities and tax situations, including the fact that major commercial real estate investors know the tax code well and take advantage of allowed ways to reduce their taxes and therefore some such investors could not take advantage of additional tax breaks.

## The Commercial Real Estate Market

A report by Savills, an international real estate adviser, suggests the total value of global real estate reached \$217 trillion in 2015, representing 60% of mainstream global assets. Residential real estate makes up three-quarters of the global real estate market and the remaining 25% is divided almost evenly between commercial real estate (\$29 trillion) and agricultural or forestry land (\$26 trillion). North America accounts for a substantial portion of both the residential and commercial sector; representing nearly half of the entire global commercial market and 21% of the residential market, despite having only 5% of the world's population (Hackett 2016).

According to the 2012 Commercial Buildings Energy Consumption Survey (CBECS), there are over 5.5 million commercial buildings in the United States, totaling almost 90 billion square feet (EIA 2016). Of the over 5.5 million buildings, almost 2.5 million are owner-occupied, 1.75 million are leased to a tenant, 776,000 are government owned, nearly 350,000 are partly owner occupied and partly leased, and 221,000 are unoccupied. The average site energy usage was 80.0 BTU per square foot, which is down from 91.0 BTU in 2003 (EIA 2016).<sup>1</sup>

Commercial real estate is often managed or owned by real estate investment trusts (REITs), limited liability partnerships (LLPs), or limited liability corporations (LLCs). A REIT is a company that owns real estate that generates income. Investors can purchase stock in REITs, and are able to invest in real estate without actually owning any physical assets. Owning real estate can generate a return on investment and diversify a portfolio, but physical real estate assets are relatively illiquid compared to stock ownership. REIT ownership allows an investor some of the benefits of owning real estate without the complications of owning the physical asset. REITs pass along the tax burden of their generated income to investors, requiring investors to pay these taxes. The taxes paid are predominantly taxed as ordinary income, which can be significantly higher than taxes on qualified dividends or long term capital gains (Morningstar 2017).

Commercial Real Estate Investment Trusts (REITs) in the US own roughly \$1.8 trillion of commercial real estate assets. In 2015, those REITs paid out \$51 billion dollars in dividends, sixty-six percent (\$33.7 billion) of those dividends are classified as ordinary taxable income, while 12% (\$6.1 billion) are a return of capital and 22% (\$11.2 billion) are long term capital gains (NAREIT 2016a). According to the North American REIT trade association, these REITs have historically, performed better than the Dow Jones Industrial Average (DJIA) and the NASDAQ Composite (NAREIT 2016a). Two important sectors of the REIT industry, office and retail, are expected to see rent growth of 1.5% and 1.7%, respectively, and it is estimated that an additional 50 million square feet of office space will be built, during 2017 as well (CBRE 2016).

Data are available on REITs because 200 of the 1,100 in the United States are publicly

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<sup>1</sup> Site energy usage is the energy used on-site and does not include distribution system losses nor inefficiencies in the generation of electricity.

traded, and their reports to the Securities and Exchange Commission are public information (NAREIT 2017). Unfortunately, data on partnerships and LLCs are more difficult to ascertain as they are privately held and are therefore not required to report as publicly held corporations do. Industry experts suggest REITs, LLCs and LLPs compose roughly 20% of the commercial real estate market, although it is difficult to confirm this information due to the lack of available data on LLCs and LLPs (pers. comm. Calvin Schnure, Senior Vice President, NAREIT, February 2, 2017).

Like REITs, LLPs and LLCs are organized in a way that allows taxation to pass along to owners. While these corporate structures do not have publicly traded stock, they are designed to have multiple owners who provide capital for real estate investments and share in the profits. The true benefit of both of these structures is the 'limited liability', which can protect owners from lawsuits related to the property (Weaver 2017). The primary difference between the two corporate structures is that LLCs offer limited liability to all owners, whereas LLPs have a general partner that has unlimited liability (Investopedia 2017). Owners of stock in REITs are protected from personal liability due to the structure of stock as an investment mechanism.

## Energy Efficiency in Commercial Real Estate

Energy efficiency represents a substantial investment opportunity in commercial real estate. The Rockefeller Foundation, in collaboration with Deutsche Bank, estimated that there are \$72 billion worth of available upgrades in existing commercial real estate in the United States. By not investing in energy efficiency, those building owners are missing out on an estimated 848 trillion BTUs of energy savings (Rockefeller Foundation and Deutsche Bank 2012). Some of the available efficiency opportunities in commercial buildings that were identified in this study are summarized in table 1. Globally, it is estimated that owners of commercial real estate will invest \$960 billion dollars from 2014-2023 in greening their buildings, primarily through energy-efficiency measures (Clancy 2014).

Table 1. Common energy efficiency measures used in commercial building retrofits.

<b>Controls</b>	<b>Payback (yrs.)</b>
Controls retrofits and control strategies	3-4
Demand controlled ventilation	2-5
<b>Mechanical</b>	
Variable flow primary/secondary systems with controls, VFDs	2-4
<b>HVAC</b>	
Constant speed air handlers to variable air volume	2-4
VAV boxes, control setpoints, box flow minimums	5+
Boiler conversions from steam to hot water	5-8
High efficiency fully condensing boilers	6-8
High efficiency VFD chiller system	8-12
<b>Lighting</b>	
Install controls to schedule and interior systems	2-4
Convert incandescent to CFL	1-3
Replace exit signs with LED kits	<2
Convert T12 to high efficiency T8s with electronic ballasts	2-5

Source: Rockefeller Foundation and Deutsche Bank, 2012.

The above figures are for buildings used for commercial purposes. However, REITs, LLCs and LLPs are also sometimes used for multifamily housing including low-income housing. In 2015, multifamily buildings with 5 or more apartment units represent almost 18% of all housing units in the United States (21.1 million of 118.2 million units (EIA 2017). In 2009, multifamily homes represented nearly 17% of US housing units and nearly 9% of residential energy usage (EIA 2012). A 2012 study suggests there are approximately \$17 billion of potential investments in energy efficiency in the multifamily sector, which would result in 175 TBtu of annual energy savings (Rockefeller Foundation and Deutsche Bank 2012). A 2017 ACEEE paper reports that utility spending in this space has grown significantly in recent years, but still represents an opportunity for more investment (Samarripas et al 2017). The 50 largest apartment owners in the United States own nearly 3 million units, with 21 of the 50 report owning subsidized, low-income apartments. Of the top 50 owners, eight REITs made the list. Those eight REITs have a combined total capitalization (market capitalization, value of perpetual preferred stock, and book value of total outstanding debt) of nearly \$150 billion and own over 500,000 units (NMHC 2016). Market experts see multifamily as a growth sector for investments, particularly as homeownership rates are trending downwards, driving demand for rental properties (NAREIT 2016a, NAREIT 2016b). Based on these considerations, we also include multifamily housing within the scope of potential clean energy tax cuts.

Three leading programs, ENERGY STAR™ Buildings, Leadership in Energy and Environmental Design (LEED), and The Global Real Estate Sustainability Benchmark (GRESB), seek to identify energy efficiency or “green” buildings or portfolios through a

certification and/or benchmarking process (there are also several other programs, including some regional ones).

ENERGY STAR Buildings, a program created in 1992 and run by the Environmental Protection Agency (EPA), invites commercial building owners to voluntarily participate in a benchmarking practice (Energy Star 2017). The program provides a score of 0-100 (a score of 50 represents the industry average) and 25,000 commercial buildings have earned the Energy Star certification by earning a score of 75 or higher and having these results certified by an engineer or architect (Energy Star 2017). From inception to 2015, more than 450,000 buildings, representing more than 40 billion square feet, have been benchmarked. Certified Energy Star buildings have saved an estimated \$3.4 billion as a result of their efforts (Energy Star 2017).

LEED, developed by The United States Green Building Council (USGBC), is another program that has developed a rating system for all types of building. LEED buildings across the globe represent 17.1 billion square feet of building space and on average they use 25% less energy when compared to non-certified buildings according to USGBC (2016a). LEED awards points for buildings that meet specific criteria or green-building practices. Depending on the number of points awarded, the building can be classified as LEED Certified, LEED Silver, LEED Gold, or LEED Platinum (USGBC 2016b).

The Global Real Estate Sustainability Benchmark (GRESB), is a program that seeks to assess and benchmark real estate investments. Created in 2009 to provide sustainability data to investors, GRESB evaluates and scores the environmental, social, and governance (ESG) performance of real estate portfolios, real estate debt providers, and infrastructure funds and assets. After assessing the data, each fund or portfolio receives a GRESB score that benchmarks it to other rated funds and portfolios (Sciullo 2015, GRESB 2017). Over 250 members, 60 of which are pension funds or their fiduciaries, rely on the information GRESB collects in order to understand the sustainability risks of potential or actual investments (GRESB 2017). So far, GRESB has analyzed over 1,000 property companies and funds and almost 200 infrastructure assets and funds (GRESB 2017). GRESB evaluates portfolios of buildings and not individual buildings.

Benefits of energy efficiency investment in commercial real estate extend beyond energy savings. A 2012 study showed that important financial metrics like return on assets and return on equity were positively correlated with LEED or ENERGY STAR certification (Eichholtz et al 2012). A study that compared Energy Star and LEED office buildings to similar office buildings revealed that rental rates in the “green” buildings were 3% higher per square foot than their non-green counterparts. When costs of maintaining and operating the properties were factored in, the “green” buildings had an effective rent<sup>2</sup> that was 7% higher than similar non-green building. Energy Star and LEED office buildings also saw a 16% premium in their selling prices (Eichholtz et al 2010) and experienced lower default rates (An and Givo 2015).

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<sup>2</sup> *Effective rent* is income after all maintenance and operating costs are factored in.



## Straw Proposal for a Clean Tax Cut for Commercial Real Estate

The goal of a clean tax cut for commercial real estate is to spur significant additional investment in energy-saving measures in order to substantially reduce energy use of these buildings. In the sections below we outline some of the key aspects a proposal should or may address, making tentative recommendations but also framing alternative options and questions. The goal of this discussion is to spur thinking prior to the March 23, 2017 workshop and give participants something to react to. Following the workshop we will develop a more fleshed out proposal based on the feedback and suggestions received.

### *1. WHAT CRITERIA MUST A BUILDING OR SET OF BUILDINGS MEET TO QUALIFY FOR A LOWER TAX RATE?*

Tentatively we are thinking that buildings that are Energy Star certified will qualify for a lower tax rate. Using EPA's ENERGY STAR Portfolio Manager tool, building owners and managers can benchmark the energy efficiency of their buildings on a 1-100 scale (and many have done so). Users enter whole building energy use for a 12-month period as well as key business activities, such as hours of operation. The 1-100 score adjusts for these business activities, as well as weather and building size. Buildings that score 75 or higher are in the top quartile of energy performance for similar buildings, and eligible to apply for ENERGY STAR certification. A registered architect or professional engineer must review the building's energy and other data, visit the building, and stamp the application before it can be submitted to EPA. ENERGY STAR 1-100 scores are available for the vast majority of commercial building types (including offices, retail, schools, hospitals and multifamily), which represent about 60% of commercial floor area nationally. Most of the ENERGY STAR scoring models are based on the Energy Information Administration (EIA) Commercial Building Energy Consumption Survey (CBECS), with the remainder based on other nationally representative survey data. EPA updates the models that use CBECS data when EIA updates the CBECS. Presently, the CBECS-based models use data from the 2003 survey; EPA is in the process of updating these models based on the 2012 CBECS. EPA plans to release these updated models in 2018.<sup>3</sup>

Energy Star certification is based on a year of performance data and thus buildings must be recertified each year. Our thinking is that this could be done early in a calendar year based on data for the preceding calendar year, and the results reported to tax payers before they file their taxes in April (although we understand that extensions are common for real estate investors). Still, this schedule may be tight and an option might be to allow certifications from a year earlier to count (e.g., for filings on 2016 income, allow certification on 2015 data if the 2016 data is not available in time). However, if this option is used, tax payers should not be able to claim a lower tax rate for two consecutive years using the same certification – each year a new certification would be needed.

Alternative qualifying criteria could include Leadership in Energy and Environmental

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<sup>3</sup> See

<https://www.energystar.gov/buildings/facility-owners-managers/existing-buildings/use-portfolio-manager/update-energy-star-scores-cbecs> .

Design (LEED), and there might possibly be a way to leverage GRESB reviews. Both include energy efficiency features, but unlike Energy Star, do not incorporate actual building performance. In addition to energy, both include a variety of other sustainability features.

It should also be noted that while many governments are interested in promoting energy efficiency and sustainability in commercial real estate, there are also other public purposes that can be served in this sector including historic preservation and providing affordable housing. There are currently tax incentives for these purposes and incentives for these purposes are likely to continue in some form after tax reform.

*2. HOW MUCH LOWER WOULD THE TAX RATE BE FOR QUALIFYING BUILDINGS?*

For income from qualifying buildings, we are tentatively thinking of using the same tax rate as is used for long-term capital gains. Currently this rate is 15% for most taxpayers but 20% for those in the highest tax bracket. Under the “Better Way” proposal put forward by the House of Representative’s leadership, long-term capital gains would be taxed at half the rate of normal income (better.gop 2016). Other variations are likely to emerge as part of tax reform discussions. The long-term capital gains rate is well-known to investors and is substantially lower than the marginal tax rate on normal income that many of these investors pay. It would be hard to propose a lower rate than this. If costs are a major consideration, a slightly higher rate (say 20%) could be used, but this would reduce the incentive to qualify.

*3. WHAT DOCUMENTATION WOULD TAX PAYERS NEED TO PROVIDE TO THE IRS?*

We are tentatively thinking that property owners or managers would report qualification for the lower tax rate on official IRS forms that report income to investors such as the IRS Schedule K-1. Owners and managers would need to keep supporting paperwork on file, but for individual taxpayers, having a form with this box checked would be sufficient. We invite feedback on this approach.

*4. HOW WOULD PORTFOLIOS OF BUILDINGS BE HANDLED IN REPORTING TO TAXPAYERS AND THE IRS?*

There are two options for trusts or partnerships that own more than one building. First, they could separate income into two categories, normal income and income qualifying for the reduced tax rate. This is generally how long-term and short-term capital gains are reported to investors. Alternatively, and perhaps a little simpler, they could report total income and then report what percentage of this income qualifies for the lower tax rate. This approach is similar to how many mutual funds report foreign or tax-exempt interest to investors. We invite feedback on these options.

*5. SHOULD THE QUALIFICATION LEVEL NOT CHANGE, OR SHOULD BUILDINGS BE REQUIRED TO SHOW IMPROVED PERFORMANCE OVER TIME IN ORDER TO MAINTAIN ELIGIBILITY FOR THE LOWER TAX RATE?*

If we use Energy Star Buildings Certification, then the criteria to be in the top quartile and be certified will slowly increase. Currently certification is based on CBECS 2003 data, but

this will be changed to CBECS 2012 data as of 2018. Overall, we are expecting only modest changes in qualification levels, although changes may be larger for some building types and in some regions. If the next CBECS gathers building characteristic and energy use data for 2018, and it takes six more years to process the data and update Portfolio Manager, then there would be another update in about 2024.

Given the slow pace of this process, and our tentative observation that CBECS updates will generally have only a modest impact on qualification levels, we are thinking that some additional improvement should be required. As a straw proposal, we suggest that a building be able to qualify for a lower tax rate by meeting Energy Star for up five years (continuous or intermittent depending on whether the building misses certification in some years), but after five years of qualification, that a Portfolio Manager score of 85 or more be required. Alternatively, the period could be shortened (e.g., three years) and the jump in score reduced (e.g., three years at 80 or more followed by three years at 85 or more). Our hypothesis is that bigger improvements less often will be easier for property owners and managers but we welcome feedback on this issue.

*6. HOW MUCH ENERGY MIGHT THIS PROPOSAL SAVE AND HOW MUCH WOULD IT COST THE FEDERAL GOVERNMENT?*

We have prepared a very approximate estimate of how much energy might save and how much it might cost the federal treasury. Our many estimates and assumptions are provided in table 2. Overall, this preliminary estimate indicates that after ten years, this proposal might save 90 trillion Btu energy per year, with average energy savings of about 15% in upgraded buildings. Our very preliminary estimate is that this proposal might cost the federal treasury \$494 million over ten years, an average of about \$49 million per year.

This is a modest cost but assumes that only 20% of the commercial building stock is targeted (the REIT, LLC and LLP proportion that is passed through to individual income taxes) and that about 15% of this market is motivated by the program to earn Energy Star certification (in addition to about 4% that is already certified and 4% that might earn certification in the next ten years without a clean tax cut). If more buildings are targeted and/or more buildings participate, then savings and costs will be higher. We welcome feedback on the calculations and assumptions.

The average cost to the Treasury is about \$1.40 per million Btu of energy saved, about 12% of the estimated average cost of energy.

*7. HOW MIGHT WE PAY FOR THIS TAX CUT?*

For all tax cuts, a key question is how will the federal government pay for this tax reduction? In this case, by reducing energy use in commercial buildings, we increase profitability of these buildings, which can increase the amount of taxes paid by these buildings. In table 2 (above) we provide a very much simplified analysis of these effects, finding that about 40% of the cost to the Treasury might be offset by the additional taxes due to improved profitability caused by lower energy bills. This is a very simple analysis that assumes that all of the energy savings flow through to profits. In actuality, some of

these savings will be invested, and thus this very simple analysis therefore implicitly assumes that to the extent some of the savings are invested, then these additional investments will not on average lose money and therefore ultimately these investments will earn as much taxable income as the amount reinvested.<sup>4</sup> Much more analysis is needed to improve on this very simple analysis.

There are also other ways to pay for this clean tax cut. In recent years the federal government has paid about \$1.14 billion per year for energy efficiency tax incentives (JCT 2014). These tax incentives expired at the end of 2016. In the past these tax credits have been extended retroactively and this could potentially happen this year. Thus, a portion of historic “tax expenditures” could be channeled to these clean tax cuts. And some economists believe that capital tax cuts such as these will help grow the economy, increasing revenue. For example, papers by two recent Chairs of the Council of Economic Advisors, one under George W. Bush (Greg Mankiw, now at Harvard) and one under Barack Obama (Christina Romer, now at UC Berkeley), attempt to quantify these effects, leading to a guideline from Greg Mankiw that on average about 25% of the cost of a capital tax cut might be recouped from additional tax revenue (Richardson 2016).

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<sup>4</sup> If these investments lose money, then taxable income will go down. Conversely, if these investments do well, taxable income will increase.

Table 2. Very Preliminary Estimate of Participation, Benefits and Costs of Clean Tax Cuts for Commercial Real Estate.

Item	Value	Units	Notes
1 Commercial building floor area	87	billion sf	From EIA CBECS 2012.
2 Percent REITS, LLCs and partnerships	20%		Estimate from NAREIT.
3 Target market	17.4	billion sf	Row 1 * Row 2.
4 Approx. sf of comml bldgs benchmarked with Energy Star	40	billion sf	From 2015 EnergyStar Snapshot.
5 Approx. sf of comml bldgs certified as EnergyStar	5	billion sf	From 2015 EnergyStar Snapshot.
6 Estimated sf of target market that is EnergyStar certified	0.7	billion sf	Row 3 * (Row 5/Row 4) * Row 2 * 150% (guess that target market is 50% more likely to be certified than commercial buildings overall).
7 Growth in sf of target market in next 10 years without CTC	0.7	billion sf	Guess that EnergyStar certification will double over next 10 years without CTC.
8 Incremental EnergyStar certification due to CTC	2.6	billion sf	Guess that with CTC, EnergyStar certification over next 10 years will be double the levels without a CTC.
9 Base source energy use per sf	153	kBtu/ sf	Derived from EIA CBECS 2012 assuming 40% electric system efficiency.
10 %energy savings	15%		EnergyStar reports 7% long-term savings from buildings that are repeatedly benchmarked, we double this for buildings that are certified, presuming many need to upgrade to earn certification. Some buildings will save more than this but other buildings will qualify without upgrades, only needing
11 Incremental annual energy savings in year 10	60	trillion Btu	Row 8 * Row 9 * Row 10.
12 Annual income from targeted buildings	\$ 34	billion	NAREIT Industry Financial Snapshot estimates \$51 billion in REIT payouts of which 66% is ordinary income (rest is return of capital or long-term capital gains).
13 Average marginal tax rate on this income	16.7%		Estimate one-third of targeted buildings don't owe federal taxes and other two-thirds have an average marginal tax rate of 25%
14 Annual federal tax on this income	\$ 5.6	billion	Row 12 * Row 13.
15 Average marginal tax rate for CTC participants	10.0%		15% tax rate times 2/3 since assume one-third of this income is not currently taxed.
16 Lost federal taxes in year 10	\$ 84	million	Row 14 * (Row 6 + Row 7 + Row 8) / Row 3 * (Row 13 - Row 15).
17 Lost federal taxes over 10 years	\$ 493.92	million	Assume straightline ramp up from current EnergyStar certification levels (4% is already Energy Star and applies for 10 years, 19% gradually ramps up and applies for average of 5 years).
18 Average federal cost per unit energy saved	\$ 1.40	\$/million Btu	Row 11 / Row 16 * 1000 (needed to convert from \$/billion Btu to \$/million Btu). If lower tax rate ends after 5 years unless a higher target is reached, this cost will go down.
19 Average energy price	\$ 11.77	\$/million Btu	Weighted average for commercial sector for 2020 derived from EIA AEO 2017.
20 Value of annual energy savings in year 10	\$ 705	million	Row 11 * Row 19
21 Cost of improvements in year 10	\$ 352.51	million	Assume improvements in row above are spread over 10 years, that they have an average 5 year simple payback and that the cost of these improvements can be expensed (after tax reform). Row 20 / 10 years * 5 year simple payback.
21 Change in income in year 10	\$ 353	million	Row 20 - Row 21
22 Annual federal revenues on these savings	\$ 35	million	Row 21 * Row 15. This does not include the additional economic activity induced when energy bill savings are respent.

### *OTHER QUESTIONS*

A variety of other questions must be considered in developing a clean tax cut for commercial buildings. Among these questions are the following:

1. What types of buildings, ownership and tax structures is the above proposal most likely to appeal to? Are there modifications that could be made to better include additional building and ownership types and tax structures? What changes would be most useful for attracting substantial additional interest?
2. What level of tax cut would be needed to incentivize investment to reduce energy use? Would the proposal to approximately cut the tax rate in half be a sufficient incentive for many owners and investors? How does the structure influence the impacts (e.g., who can and can't take advantage of it)?
3. If we use Energy Star, then theoretically 25% of buildings are eligible for certification without doing anything but currently only about 4% of eligible buildings are certified. Would this proposal spur widespread certification of these eligible buildings and therefore induce substantial "free riders"? Should we consider an alternative eligibility metric to avoid this problem?
4. This proposal is focused on what can be done with real estate income that flows through to individual income taxes. Is there something that would be useful to do for corporate taxes such as cutting their income taxes in half for eligible income? How big a difference would such a program make in spurring new energy-saving investments?
5. Is the Energy Star certification process adequate or should some additional steps be required, either by EPA or the IRS? How about the LEED process?

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## Appendix – Other Work on Clean Tax Cuts

ACEEE's work on commercial real estate is one of seven clean tax cut topic areas now being investigated. Other topics and workshop dates are as follows:

- Green Bonds. Columbia University CTC Working Group: Energy & Environment, SIPA; Sabin Center for Climate Change Law, New York - March 6, 2017.
- Agriculture, Forestry and Other Land Use. The Nature Conservancy, Rodale Institute, Washington, DC - April 3, 2017.
- Oil & Gas. One Step In Foundation, Getches-Wilkinson Center for Natural Resources, Energy, and the Environment at the University of Colorado School of Law, Boulder, CO - April 8 - 9, 2017.
- Transportation. R Street Institute, Washington, DC - April 14, 2017
- Utilities and power. American Legislative Exchange Council (ALEC), Washington, DC - date TBD.
- Clean technology. Arizona State University (ASU), LightWorks, Center for Negative Carbon Emissions - Arizona, date TBD.

If you are interested in any of these, please contact :

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