Clean Tax Cuts for Commercial Real Estate

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Working 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 two proposals for clean tax cuts for commercial real estate. These proposals are based on discussions at a "charrette" workshop hosted by ACEEE in March, 2017. The first proposal involves providing a lower tax rate (the long-term capital gains rate) for income from buildings that are Energy Star certified. The second proposal involves expensing or accelerated depreciation of energy efficiency investments for all commercial buildings, including those where income is passed on to individual tax returns as well as those covered by business tax returns. A variety of issues are raised and discussed.

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). Clean tax cuts could be used to reduce interest rates on "green" bonds, encourage land and natural resource conservation, and encourage energy efficiency in commercial buildings. 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 2006-2012, the average effective corporate federal income tax rate was 14% for profitable companies [GAO 2016]; 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 but also providing opportunities for all 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 (Hacket 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. From the perspective of building floor area, about 40% is owner occupied but not government owned, about 35% is leased and 22% is government-owned.[1] When we look at annual commercial building energy use, the figures change slightly – 43% owner occupied but not government owned, 34% leased and 23% government owned. The average site energy usage in 2012 was 80.0 BTU per square foot, which is down from 91.0 BTU in 2003 (EIA 2016).[2]

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 and 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 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

[1] These figures split the 10% that is both owner occupied and leased evenly between owner-occupied and leased. The other 2% is unoccupied.

[2] Site energy usage is the energy used on-site and does not include distribution system losses nor inefficiencies in the generation of electricity.

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 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. One industry expert suggests REITs, LLCs and LLPs compose roughly 20% of the commercial real estate market, or perhaps somewhat higher. This expert notes that it is higher for regional shopping malls (60-70% are REIT owned), lower for multifamily buildings (perhaps 15% REIT owned), with other building types in-between (pers. comm. Calvin Schnure, Senior Vice President, NAREIT, February 2, 2017). It is difficult to confirm this information due to the lack of available data on LLCs and LLPs. On the other hand, the fact that about 35% of floor area is leased perhaps indicates that the REIT, LLC and LLP share might be larger. At our Commercial Real Estate Charette (discussed below), participants were more inclined to estimate 35% as REIT, LLC and LLP rather than 20%.

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.

Controls	Payback (yrs.)
Controls retrofits and control strategies	3-4
Demand controlled ventilation	2-5
Mechanical	
Variable flow primary/secondary systems with controls, VFDs	2-4
HVAC	
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
Lighting	
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 represented 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 buildings. 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[3] 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

[3] *Effective rent* is income after all maintenance and operating costs are factored in.

rates (An and Givo 2015).

Commercial buildings in the United States are generally categorized into Class A, Class B, or Class C, with A being a better classification than B, and B better than C. There are no formal standards for determining into which class a building is placed, and the Building Owners and Managers Association International (BOMA International) recommends against publishing the classifications for individual buildings (BOMA 2017). The appearance, age, and infrastructure of the building itself is critical to the classification; Class A buildings tend to be newer and have higher-quality materials and systems than their Class B counterparts. The classifications are, however, respective to other buildings within the same marketplace; so a Class A building in one market may not be a Class A in another. Additionally, the classifications are not based entirely on the quality of the building itself, but take into account the desirability of the location as well as the amenities offered by the building management. All combined, the classifications represent a scale of desirability for potential tenants. Higher classifications also correspond with higher rents (Imperiale 2006). In research done by the National Association of Realtors (NAR), Class A office buildings received an average rent of $135 per sq. ft. and Class B and C office buildings received an average of $93 per square foot (NAR 2017).

Class A building owners tend to invest more in energy efficiency than Class B and C buildings. This is partly a result of building owners seeking to attract tenants who prefer green certification, and partly because Class A owners and tenants have more resources to undergo these types of improvements. Studies suggest that organizations with highly skilled and compensated employees tend to prefer LEED and Energy Star buildings to their non-green counterparts (DOE 2015). Partially as a result of this, green certifications are becoming the standard for Class A building developers in large metropolitan areas (Kolstad 2016). While Class B tenants may be interested in green improvements, they are more price-sensitive and are less willing to pay more for it (Hughes 2014). Class A tenants also typically have more room in their capital budgets that would allow them to self-finance energy efficiency improvements if the building owner were unable or unwilling to (Bell et al 2013). This is not always an option for tenants of Class B and C buildings. Class B and C buildings still have a lot of potential for energy efficiency investment, but currently the efficiency market is dominated by Class A buildings. Thus, charrette participants suggested that clean tax cuts pay specific attention to the Class B and C markets.

Learning from Historic Building Tax Credits

The Rehabilitation Tax Credit is a tax break for the repairs done on historic buildings. The National Parks Service must certify the building in order for it to qualify. The credit amounts to 20% of the costs associated with the rehabilitation of certified historic structures and 10% for buildings placed in service prior to 1936 (IRS 2017). To date, the tax credit has preserved over 40,000 buildings and used $23.1 billion in tax credits. Those funds have also generated $28.1 billion in tax revenue, created more than 2 million jobs, and generated over $120 billion in private investment (NTHP 2017).

Options for Clean Tax Cuts for Commercial Real Estate

There are several options for using clean tax cuts to encourage energy efficiency investments in commercial real estate. We held a "charrette" workshop on March 23, 2017 at which a variety of options were discussed. Two principal clean tax cut options emerged from the discussions:

1. A reduced tax rate on individual income from trusts and partnerships that derive from efficient buildings
2. Expensing or accelerated depreciation on investments to improve the efficiency of commercial real estate (and potentially extending to other types of businesses).

We discuss these options in the sections below.

REDUCED TAX RATE ON INCOME FROM EFFICIENT BUILDINGS

Basic Proposal

The concept is that income from ENERGY STAR certified buildings will qualify for a lower tax rate. For income from qualifying buildings, we think an appropriate rate might be 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. A variation on this option would be to further cut the capital gain tax rate on these buildings in half, although the additional financial benefits to the average building owner would be modest[4] and there would be substantial political challenges cutting the capital gains rate further (some Democrats want to raise the tax rate on capital gains, not lower it).

How ENERGY STAR Buildings Works

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

[4] As discussed in an earlier section, about 12% of REIT income is capital gains on average and hence a lower tax rate would only apply to this 12% of income, far less than the 66% of REIT income that is not capital gains (remaining REIT income is return of capital that is not taxed).

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.[5]

ENERGY STAR certification is based on the entire building and thus for leased buildings that are submetered, owners need access to data on tenant energy use so that whole building energy use can be calculated. Some states have procedures whereby owners can obtain aggregated tenant consumption data from their utility (aggregated so that individual tenant privacy is preserved). Charrette participants agreed that such mechanisms are essential for a tax incentive based on ENERGY STAR.

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.

Alternatives

Alternative qualifying criteria could include Leadership in Energy and Environmental 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. For these reasons, charrette participants preferred ENERGY STAR over LEED. They further noted that GRESB is for entire portfolios and includes a variety of judgment calls and for these reasons would be hard to use for a tax credit.

Some charrette participants suggested allowing multiple ways to qualify, maximizing ways to participate. But other participants noted that savvy owners would look at the multiple systems and find the easiest one to qualify for their building, reducing energy savings and encouraging "gaming". Many participants agreed with this second point of view.

Option for high retrofit savings but short of ENERGY STAR certification

Charrette participants noted that for old very inefficient buildings, reaching ENERGY STAR performance levels could be very difficult. They suggested that the lower tax rate also be available for large improvements in Portfolio Manager score relative to a base building.

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[5] See https://www.energystar.gov/buildings/facility-owners-managers/existing-buildings/use-portfolio-manager/update-energy-star-scores-cbecs .

After a little discussion, the figure of 30% energy savings emerged as a reasonable qualifying level if ENERGY STAR performance could not be reached. This might apply for five years of lower tax rate, but then an additional 30% savings relative to the new base (or reaching ENERGY STAR levels) would be needed to continue to qualify for the lower tax rate.

What documentation would taxpayers need to provide to the IRS?

We suggest 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.

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. Charrette participants thought either option could work.

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 a tax cut is based on 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. 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. Charrette participants thought this would be adequate to keep the tax cut reasonably current.

Charrette participants also discussed the slow pace of this update process, and a tentative observation that CBECS updates will generally have only a modest impact on qualification levels. This might imply that some additional improvement should be required, such as allowing a building 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. Charrette participants thought this would be too complicated and would not capture the full value of the ENERGY STAR brand and the advantages a simple system that applies the same to all buildings.

Limitations on lower tax rates

The lower tax rate discussed above would primarily apply to the 35% of commercial building energy use that is in leased buildings owned by REITS, LLCs and LLPs. It could potentially be applied to corporate income taxes, but that would require separating out

income and expenses from individual buildings on corporate tax returns, a substantial undertaking that would reduce the incentive of a lower tax rate. And lower tax rates would not apply to the approximately 23% of commercial building energy use in government-owned buildings, not to mention buildings owned by non-profit organizations or buildings that do not have net income and therefore are not paying taxes (e.g., buildings with large available write-offs). To address this much larger market, charrette participants found that other approaches will be needed to complement or be an alternative to lower tax rates. We discuss one such approach in the next section.

EXPENSING OR ACCELERATED DEPRECIATION

Introduction

Under current tax law, when a commercial building is built or purchased, it is depreciated over 39 years, meaning that 1/39th of this cost is treated as an expense for tax purposes each year. The same 39 year depreciation period applies to building improvements that are attached to the building, such as lighting fixtures and HVAC systems, even though this equipment has a typical equipment life of 15-20 years. This long depreciation period can be a disincentive for energy-saving investments since if inefficient equipment is replaced before 39 years, the undepreciated balance is treated as an expense in the year the equipment is replaced. This issue is discussed in more depth by Nadel and Farley (2013). One exception to this 39 period is for tenant improvements – funds provided by the owner to new tenants to fit-out their new space. Such *leasehold improvements* are depreciated over 15 years.

In the House Republican *Better Way* plan, it is suggested that all business investments not be depreciated, but instead they be expensed, meaning that all costs would be counted against income in the year the expenses were incurred. On the other hand, this provision would no longer allow interest expenses to be deducted. This is an expensive provision – the Tax Policy Center estimates a 10-year cost of this provision to the federal treasury of $437 billion (Nunns et al 2016). And the real estate industry generally does not like the provision that interest expenses are not deductible, since real estate relies on long-term financing in which interest expenses are substantial (RER 2017). Thus, in our view, there is a substantial chance that immediate expensing may not be included in tax reform legislation. In this eventuality, expensing or accelerated depreciation could be used as a more targeted clean tax cut, applicable just to energy efficiency investments (and potentially other clean investments).

Financial benefits of expensing and accelerated depreciation

Table 2 below looks at the net present value (NPV) of a $100,000 investment under different depreciation periods. For expensing (the same as one year depreciation), this has a NPV benefit of 63%[6] of the amount of the investment relative to 39 year depreciation, a substantial incentive for such investments that also save money by reducing energy costs. Relative to 15 year depreciation, the NPV of expensing is 36% of the investment. Short of expensing, another option is accelerated depreciation. For 5- and 10-year depreciation periods, relative to 39 year depreciation, the NPV benefit of accelerated depreciation would

[6] $63,000 improvement in NPV relative to the $100,000 investment.

be 50% and 37% of the investment respectively.

Table 2. Net present value analysis of different depreciation periods

Depreciation period (years)	NPV of depreciation	NPV as %of investment	Value of accelerated depreciation Relative to 39 years	Relative to 15 years
1	92,396	92%	63,357	36,125
5	79,372	79%	50,334	23,102
10	66,410	66%	37,372	10,140
15	56,270	56%	27,232	-
20	48,262	48%	19,223	NA
39	29,039	29%	-	NA

Note: Discount rate based on weighted average cost of capital. For "real estate general/diversified", NYU Stern School of Management this at 8.27% as of January, 2017.
http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/wacc.htm .

Proposal for expensing and accelerated depreciation

Based on the analysis in Table 2, expensing and accelerated could provide a useful incentive for energy efficiency investments. One idea discussed at the charrette workshop is to scale the depreciation with the amount of energy savings achieved, as measured with Portfolio Manager relative to the base building. For example, buildings achieving 30% energy savings could be granted immediate expensing, buildings saving 20% could be given 5 year depreciation, and buildings saving 10% could be given 10 year expensing. Since all of these periods are less than the current 15 year depreciation for leasehold improvements, they would also encourage building owners to work with tenants to improve energy efficiency in tenant spaces.

If Portfolio Manager becomes the basis of determining depreciation periods, then the instructions for use of Portfolio Manager should be carefully reviewed, and ambiguities clarified. Under ENERGY STAR, a licensed engineer or architect must certify Portfolio Manager scores. A similar certification would be useful for use of Portfolio Manager for depreciation purposes, although perhaps the Secretary of the Treasury could be asked to develop criteria for also certifying Portfolio Manager experts who are not engineers or architects.

[Are there other details we should discuss in this section?]

What if tax reform includes expensing for all investments?

This proposal would not work if the Better Way proposal to allow expensing for all business investments is enacted. Charrette participants discussed this possibility and suggested that instead tax deductions or credits might be needed, with the size of the deduction or credit based on the level of energy savings achieved.

How Much Energy Might These Proposals Save and How Much Would they Cost the Federal Government?

We prepared a very approximate estimate of how much energy these two options might

save and how much they might cost the federal treasury. Our many estimates and assumptions are provided in table 3 for the lower tax rate and table 4 for expensing and accelerated depreciation. These are just "ballpark" estimates and are subject to large uncertainty.

For the lower tax rate, we estimate that the benefit of the lower tax rate represents on the order of 13% of the investments owners will need to make to upgrade their buildings. This is a useful incentive, but as incentives go, it is not a large incentive (in contrast, for historic properties, as discussed above, the incentive is 20% of the investment). With this moderate incentive, we estimate that an additional 4 billion square feet of commercial building floor area will be upgraded, saving an average of 15% in buildings that are upgraded. In addition, perhaps 4 billion square feet that already qualifies for ENERGY STAR but has not gone through certification might be motivated to go through certification in order to tax advantage of the lower tax rate but not saving additional energy (since by definition, 25% of floor area in included building sectors meets the ENERGY STAR qualifying criteria). Overall, our rough estimate indicates that after ten years, this proposal might save about 100 trillion Btu energy per year and cost the federal treasury $890 million over ten years, an average of about $89 million per year. The federal cost is about $1.60 per million Btu saved, a small fraction of the $11.77 per million Btu average cost of energy to commercial buildings.

For the expensing or accelerated depreciation, we estimate that the benefit of the lower tax rate represents on the order of 5% of the investments owners will need to make to upgrade their buildings, which is a small incentive. On the other hand, this would reach all commercial buildings and not just a portion of REITs, LLCs and partnerships (and could potentially reach industrial facilities as discussed in the last section of this paper). With this modest incentive, we estimate that perhaps 5 billion square feet of commercial building floor area will be upgraded. The affected floor area is similar to the affected floor area for the tax reduction, with the impacts of the lower incentive counter balanced with the fact that the target market of all commercial buildings is roughly three-times larger than the REIT, LLC and partnership market. Overall, our rough estimate indicates that after ten years, this proposal might save about 150 trillion Btu energy per year and cost the federal treasury $250 million over ten years, an average of about $25 million per year. The federal cost is about $0.22 per million Btu saved, substantially less than the cost of saved energy for the tax rate reduction.

It should also be noted that these two provisions could complement each other, with the tax rate reduction being useful for REITs, etc. and the accelerated depreciation for all buildings. If both are enacted, there would be some overlap in energy savings between the two. We did not explicitly analyze the overlap between the two but estimate that it would be modest and therefore the cost per million Btu saved if both were enacted would still be much less than the average cost of energy to the commercial sector.

Table 3. Rough estimate of participation, benefits and costs of reduced individual income tax rate 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	35%		Estimate as discussed in the report text.
3	Target market	22.8	billion sf	Row 1 * Row 2 * 75% covered by Energy Star (it's 60% of all commercial buildings but we estimate it's a higher percentage of REITs, LLCs and partnerships)
4	Approx. sf of commll bldgs benchmarked with Energy Star	40	billion sf	From 2015 Energy Star Snapshot.
5	Approx. sf of commll bldgs certified as Energy Star	5	billion sf	From 2015 Energy Star Snapshot.
6	Estimated sf of target market that is Energy Star certified	4.3	billion sf	Row 3 * (Row 5/Row 4) * 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	4.3	billion sf	Guess that Energy Star certification will double over next 10 years without CTC.
8	Incremental Energy Star certification due to CTC	8.6	billion sf	Guess that with CTC, Energy Star certification over next 10 years will be double the levels without a CTC. Of this, we estimate that half are actual upgrades and half are buildings that already meet Energy Star criteria but have not yet bothered to get certified.
9	Base source energy use per sf	153	kBtu/sf	Derived from EIA CBECS 2012 assuming 40% electric system efficiency.
10	%energy savings	15%		Energy Star reports 7% long-term savings from buildings that are repeatedly benchmarked, we increase this to 15% for buildings that are certified, presuming many need to upgrade to earn certification.
11	Incremental annual energy savings in year 10	98	trillion Btu	Row 8 * 50% * Row 9 * Row 10. E23
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	12.5%		Estimate half of targeted buildings don't owe federal taxes and other half have an average marginal tax rate of 25%
14	Annual federal tax on this income	$ 4.2	billion	Row 12 * Row 13.
15	Average marginal tax rate for CTC participants	7.5%		15% tax rate divided by 2 since assume half of this income is not currently taxed.
16	Lost federal taxes in year 10	$ 158	million	Row 14 * (Row 6 + Row 7 + Row 8)/ Row 3 * (Row 13 - Row 15).
17	Lost federal taxes over 10 years	$ 0.89	billion	Assume straightline ramp up from current Energy Star certification levels (1/8 is already Energy Star and applies for 10 years, 7/8 gradually ramps up and applies for average of 5 years).
18	Average federal cost per unit energy saved	$ 1.61	$/million Btu	Row 16 / Row 11.
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	$ 1.2	billion	Row 11 * Row 19
21	Cost of improvements over 10 years	$ 3.5	billon	Row 20 * 3 years assumed average simple payback period for investments.
22	Tax reduction as a % of owner cost	13%		(Row 17 * 50%) / Row 21. 50% is percent that upgrade per note in Row 8.
23	Cost of improvements in year 10	$ 0.35	billion	Assume improvements in Row 25 are made over 10 years and that the cost of these improvements are depreciated over 5 years (after tax reform). Row 21 * 50% not yet depreciated by year 10 / 5 years.
24	Change in income in year 10	$ 0.81	billion	Row 20 - Row 23
25	Annual federal revenues on these savings	$ 30	million	Row 24 * 50% passed thru to investors (rest reinvested) * Row 15. This does not include the additional economic activity induced when energy bill savings are respent.

Table 4. Rough estimate of participation, benefits and costs of accelerated depreciation for commercial buildings.

	Item	Value	Units	Notes
1	Commercial building floor area	87	billion sf	From EIA CBECS 2012.
2	Approx. sf of comm'l bldgs benchmarked with EnergyStar	40	billion sf	From 2015 EnergyStar Snapshot.
3	Approx. sf of comm'l bldgs certified as EnergyStar	5	billion sf	From 2015 EnergyStar Snapshot.
4	Growth in sf of target market in next 10 years without CTC	5	billion sf	Guess that EnergyStar certification will double over next 10 years without CTC.
5	Incremental sf upgraded due to accelerated depreciation	5	billion sf	Guess that with accelerated depreciation, 5 billion sf of buildings will be upgraded (i.e., the same as the amount of sf as is now EnergyyStar certified).
6	Base source energy use per sf	153	kBtu/sf	Derived from EIA CBECS 2012 assuming 40% electric system efficiency.
7	% energy savings	20%		For middle of three savings ranges discussed in text.
8	Incremental annual energy savings in year 10	153	trillion Btu	Row 5 * Row 6 * Row 7.
9	Average energy price	$ 11.77	$/million Btu	Weighted average for commercial sector for 2020 derived from EIA AEO 2017.
10	Value of energy savings in year 10	$ 1.8	billion	Row 8 * Row 9
11	Cost of improvements	$ 5.4	billion	Row 3 * Estimated 3 year average simple payback
12	Average amount of depreciation due to 5 year accelerated depreciation compared to current law	41%		From Table 2 for 5-year depreciation on average. Weight current depreciation at 67% 39 years and 33% 15 years.
13	Average effective tax rate	11%		80% of companies profitable, profitable companies on average have a 14% effective tax rate (from GAO 2016).
14	Cost to Treasury over 10 years	$ 248	million	Row 11 * Row 12 * Row 13
15	Cost to Treasury in year 10	$ 33	million	Row 14 / 10 years * 1.33 (to reflect how participation and costs are higher towards end of 10 year period than at midpoint)
15	Tax reduction as a % of owner cost	5%		Row 14 / Row 11
16	Average federal cost per unit energy saved	$ 0.22	$/million Btu	Row 14 / Row 8
17	Depreciation on improvements in year 10	$ 0.5	billion	Half of investments still being depreciated in year 10 / 5 year depreciation.
18	Change in income in year 10	$ 1.3	billion	Row 10 - Row 17
19	Federal revenues on these savings in year 10	$ 71	million	Row 18 * 50% taxed (other 50% reinvested) * Row 13. This does not include the additional economic activity induced when energy bill savings are respent.

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 3 and 4 (above) we provide a very much simplified analysis of these effects, finding that when we combine the two options, perhaps half 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 half of the energy savings flow through to investors or to profits in ways that can be taxed. 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).

Other Issues

In the charrette workshop a number of other issues came up that are worth noting.

Tax Reform Priorities

There are many issues involved in tax reform including lower tax rates and whether interest expenses will continue to be deductible on business taxes. The real estate industry cares much more about these issues than about modest energy efficiency tax incentives so it's unclear how much active support the real estate industry would put behind a clean tax cut effort.

Government and Non-Profit Owners

Over 20% of commercial floor area is owned by branches of government who don't pay taxes. And when non-profit ownership is also added, the figure is higher. The present 179D federal tax deduction includes a provision whereby a government or non-profit owner can assign their deduction to their project architect or engineer, who in turn would reduce their fees. Charrette participants recommended a similar provision for any clean tax cut targeting commercial real estate.

Tenant Improvements

Tenants generally provide their own plug load equipment, frequently specify lighting systems and sometimes specify other energy-using systems. These choices have a substantial impact on commercial building energy use. As part of the tenant build-out, charrette participants agreed that tenant submetering should be encouraged (tenants tend to use less energy when they pay for their energy) as should plug-load controls (controls that turn off plug loads when a tenant space or even an individual office or cubicle is not in use). The accelerated depreciation provision could be used by owners to help with tenant improvements and can also be used by tenants if they pay for some improvements themselves. A recent federal law also establishes a new federal *Tenant Star* program to encourage and recognize energy efficiency as part of tenant improvements. Tenant Star has developed a recommended five-step approach for tenants to follow (see https://www.energystar.gov/buildings/tenants/about_tenant_star).

Extending Accelerated Depreciation to the Industrial Sector

The accelerated depreciation concept could also be extended to improvements in the

industrial sector. For the industrial sector, Portfolio Manager cannot be used, but methods have been developed to benchmark industrial energy consumption at a facility (see https://www.energystar.gov/buildings/facility-owners-and-managers/industrial-plants/measure-track-and-benchmark/tools-tracking-and).

Could Clean Tax Cuts Apply to Property Taxes?

Generally, commercial buildings pay much more on local property taxes than they pay on federal income taxes.[7] Thus, applying the clean tax concept to local property taxes would be very attractive to building owners. However, local governments would not want to lose too much in tax revenue. A whole new research effort to explore such a concept would be useful.

Property taxes are set and collected at the local level. These taxes are a large source of income for the local government and the rate is determined by a number of factors including; other sources of tax revenue, median property value, and local government spending. As a result, property tax rates vary significantly depending on the locality. In 2015, the average effective tax rate on commercial buildings over $1 million was 2.11%, however there was much variation between cities; Detroit, Michigan and Seattle, Washington had rates of 4.13% and 0.88%, respectively (Lincoln Institute of Land Policy and Minnesota Center for Fiscal Excellence 2016). The five cities with the highest commercial tax rates are Detroit, Michigan; New York City, New York; Providence, Rhode Island; Chicago, Illinois; and Bridgeport, Connecticut. The five cities with the lowest commercial tax rates are Cheyenne, Wyoming; Seattle, Washington; Honolulu, Hawaii; Virginia Beach, Virginia; and Wilmington, Delaware (Lincoln Institute of Land Policy and Minnesota Center for Fiscal Excellence 2016).

There are states and localities that provide property tax exemption or credits for clean technology. Many states provide some type of exemption for renewable energy, predominately in the form of property tax exemption from the value that equipment adds to the property. Massachusetts, for example, grants a 20-year property tax exemption for the amount renewable energy equipment adds value to the property (DSIRE 2016). Nevada provides a tax abatement program for green buildings that qualify for the Silver Level or higher through the LEED or Green Globes rating system (Nevada Governor's Office of Energy 2017). The value of the tax abatement is determined by a point system based on LEED or Green Globe standards (full details at the Nevada Governor's Office of Energy). Montgomery County, Maryland also has a similar tiered-system based on the varying LEED qualifications (Montgomery County Department of Finance 2017).

Next Steps

This draft paper will be circulated to charrette participants and other interested parties for review and comment. We will also present a summary of our findings at Earth Day Texas.

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[7] As discussed below, property taxes average about 2% of building value. By contrast, if annual rents are 10% of building value, expenses are 90% of rents, and the effective federal income tax rate is 12% (all "ballpark" figures), then income taxes are on the order of 0.12% of building value.

Based on this review we anticipate further revisions to this paper prior to final publication.

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Appendix A – Charrette Workshop Participants

First Name	Last Name	Organization
Jennifer	**Amann**	American Council for an Energy-Efficient Economy
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Iain	**Campbell**	RMI
Candace	**Damon**	HR&A Advisors, Inc.
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Joseph	**Eaves**	NEMA
Elizabeth	**Halliday**	Grace Richardson Fund
Jason	**Hartke**	US Department of Energy
Philip	**Henderson**	Natural Resources Defense Council
Adam	**Hinge**	Sustainable Energy Partnerships
Patrick	**Hughes**	NEMA
Kevin	**Lucas**	Alliance to Save Energy
Jean	**Lupinacci**	US Environmental Protection Agency
Steve	**Nadel**	American Council for an Energy-Efficient Economy
Peter	**Nelson**	K+L Gates
Rod	**Richardson**	Grace Richardson Fund
Dan	**Seligman**	Ceres
Adam	**Sledd**	Institute for Market Transformation
Brian	**Stickles**	American Council for an Energy-Efficient Economy
Elizabeth	**Tate**	Johnson Controls
Lowell	**Ungar**	American Council for an Energy-Efficient Economy

Appendix B – 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 are as follows:

- Green bonds, facilitated by the Sabin Center for Climate Change Law, Columbia Law School.
- Agriculture, forestry and other land use, facilitated by The Nature Conservancy, Rodale Institute
- Transportation, facilitated by the R Street Institute
- Oil & gas, facilitated by One Step In Foundation, Getches-Wilkinson Center for Natural Resources, Energy, and the Environment at the University of Colorado School of Law, Boulder
- Utilities and power, facilitated by the American Legislative Exchange Council (ALEC)
- Clean technology, facilitated by Arizona State University (ASU), LightWorks, Center for Negative Carbon Emissions

Further information on all of these topics can be found at:
http://gracerichardsonfund.org/events/ .