Expanded Split Incentives in Buildings' Value Chains

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ABSTRACT

Studies on barriers to more efficient buildings present split incentives between landlord and tenant as a large factor, but one among many, including discount rates, a lack of information, and the need for an energy efficiency "champion." This understanding assumes that the landlord and tenant are the two ends in a value chain for building space. However, the other oft-cited barriers are also the result of split incentives when looking at a more complex (and more realistic) model of the buildings industry.

To show this, I present an expanded model where incentives are not just split between landlord and tenant, but between the landlord, construction company, bank, and myriad contractors involved in modern buildings. Within these firms, the incentive to decarbonize is further divided by workplace hierarchies and politics between departments. Finally, the short holding period of large buildings splits the decarbonizing responsibility between many owners over time, causing retrofits to be unable to compete for capital in a company's portfolio despite their impressive payback.

To demonstrate the persistence of this dynamic, I provide a brief early history of the energy services industry, and how the conflicting interests which combat efficiency today have existed since the start of the industry in the 1970s and 1980s.

As a result, scaling efficiency remains unrealized despite the numerous financing solutions available. These split incentives function like externalities, which are the underlying cause of all ecologically destructive economic activity. Therefore, externalities and the split incentives that cause them should be the economic framing of environmental issues, for building retrofits and beyond.

Introduction

In this report, I will argue that the barrier preventing energy service companies (ESCOs) and energy efficiency programs from utilities from selling their services to the commercial buildings sector is the structure of our economy.[1] On a market level, a firm level, and a temporal level, the modern industrialized economy is incompatible with the widespread adoption of energy efficiency. This is the only barrier to adoption, and the numerous reports written over the past 50 years which list many barriers such as lack of energy efficiency experts on staff, high hurdle rates, and a lack of communication between tenants and owners are actually listing the many ways that this barrier manifests itself. I say this not to invalidate this useful research but to reframe it. This reframing is necessary as energy efficiency advocacy today requires a higher sense of urgency.

[1] Here, the "commercial buildings sector" refers to for-profit buildings and the companies involved with them. This means multifamily housing and commercial buildings which are owned and managed by private companies, and excludes single family housing and the MUSH (municipalities, universities, schools, and hospitals) sector. This paper also focuses on the efficiency upgrades to existing buildings.

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First I will map out the web of relationships between firms, within firms, and between building owners over time that constitutes the incompatibility with the modern industrial economy and energy efficiency. Each of these relationships create distinct split incentives that further impede energy efficiency. I then show the permanence of these issues by providing a brief early history of the energy services industry and detailing how, from the start of the industry, the basic economics of modern companies stood in the way of greater market proliferation. These problems can be understood as an expanded model of the owner-tenant split incentive issue. The split incentive is cited in every study as one of the main barriers to energy efficiency. I argue that it is the only barrier.

Then, I will describe how energy efficiency and its split incentives can be understood analogously to environmentalism and negative externalities. This theoretical analysis is practically useful to the energy services industry: if we do not understand the basic disagreements between our economy and energy efficiency, we will be stuck writing and sponsoring the same "market barriers to energy efficiency" reports as the climate crisis deepens.

The Split Incentive Framework[2]

A split incentive is when the benefit of a transaction is not accrued by the payer, discouraging the transaction. The classic example of this is the relationship between landlord and tenant. The landlord could install a more efficient heating system that would lower heating bills. However, if the tenant pays the heating bill, the landlord does not have a personal financial incentive. In fact, the landlord has a disincentive, as they would have to pay for the improvements and never make their money back. Therefore, the conflicting interests of the landlord and the tenant prevent energy efficiency from being implemented. This value chain is depicted in Figure 1.

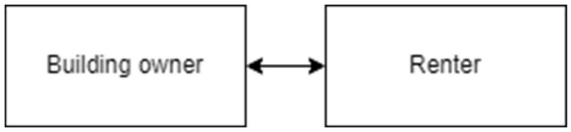

Figure 1: Basic Value Chain

This is a simple depiction of the split incentive, containing just two nodes of the renter and the building owner, which we will expand upon later. This split incentive is typically present in rented homes: 87% of renters in the United States pay their own electric bills; among renters which use fossil fuels for home heating (natural gas, propane, and fuel oil), 71% are wholly responsible for their fuel bill (EIA 2020). For commercial buildings, there is less information available. For commercial buildings, it is more common for the building owner to pay the utility bills (under what is called a gross lease), meaning the incentive wouldn't be split. However, one study found that owner-occupied commercial buildings were four times as likely to be retrofitted than leased commercial buildings, demonstrating a noticeable influence of ownership on efficiency (Kontokosta 2016).

[2] Here I present an abridged version of the framework I lay out in Mooney (2023), for further reading.

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Expanding the Framework With a Second Dimension

This landlord-tenant split incentive is well understood by the efficiency scholarship, but split incentives also exist between all market participants: between the contractor and the architect, between the architect and the developer, between the developer and its financial backers, and more. This can be considered a two-dimensional web of split incentives, with market players existing on the "axes" of proximity to the building sector (direct-indirect) and at which stage of the value chain they are involved (upstream-downstream).[3] In this web of actors, each one is incentivized to cut its individual costs, prioritizing financial performance over end-use efficiency (Sorrell et al. 2000). Thus, the more "nodes" in the value chain, the more steps where investment is tamped down. A model of this more complex and complete value chain is provided in Figure 2.

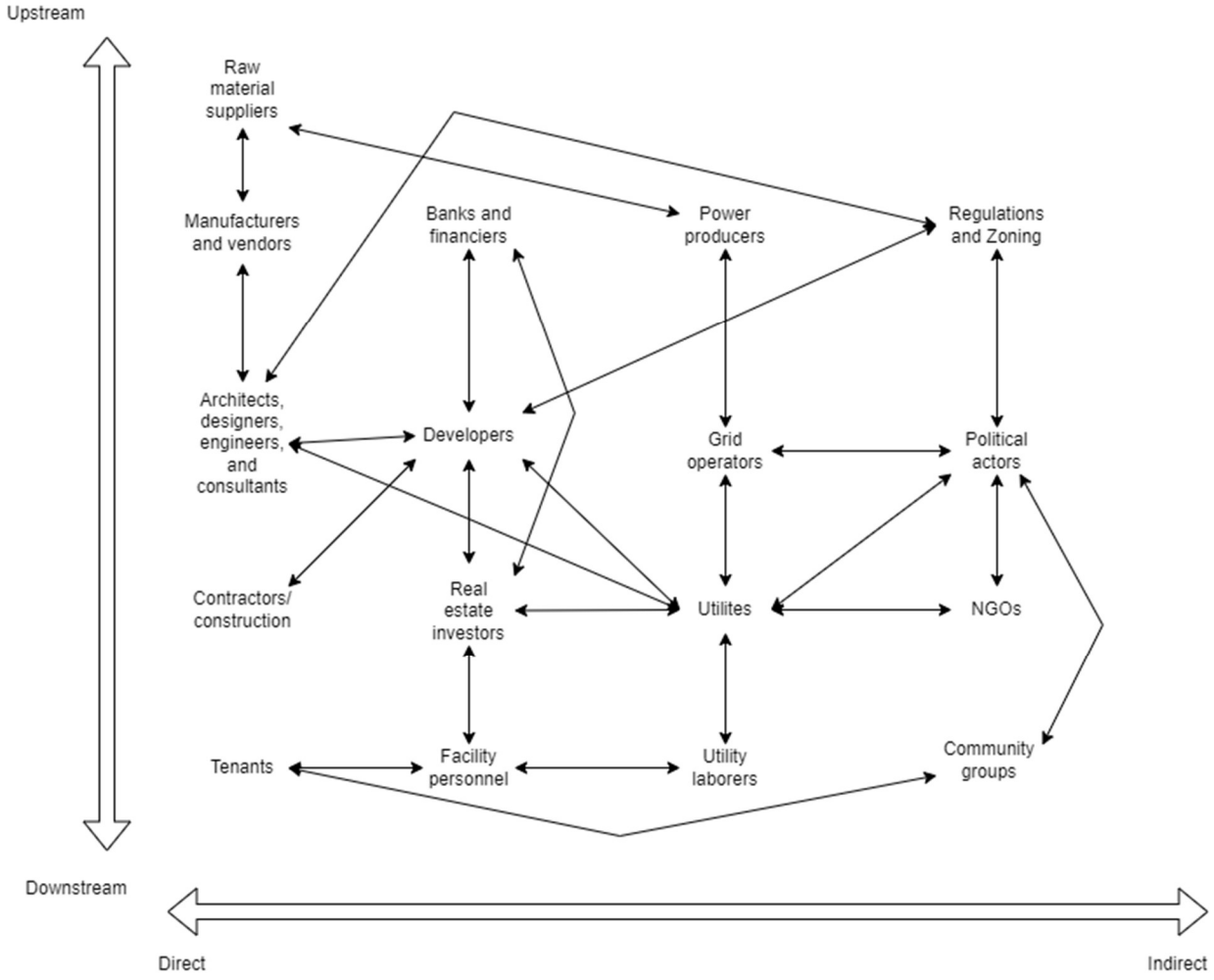

Figure 2 A More Complicated Value Chain

[3] Several authors, including myself, have created diagrams to show the web of interactions visually (Lutzenhiser et al. 2000; Sorrell et al. 2000; Jin et al. 2014; Morrissey, Dunphy, and MacSweeney 2014; Whitney, Dreyer, and Riemer 2020; Mooney 2023).

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For example, if a contractor is hired for a job with a defined budget, it can maximize its returns by completing it cheaply, eschewing more expensive efficient equipment. The financial backers of a real estate developer typically prefer to get fast returns, which happens when buildings are built cheaply and take less time to pay back. Indirectly, more efficient buildings may require changing zoning laws, but that relies on political actors, which in turn have their own incentives, and who generally find that re-zoning areas is an arduous journey beset by bureaucracy and NIMBYs.[4]

Dimensions Three and Four: Workplace Hierarchies and Lateral Divisions

An oversimplification inherent in this two-dimensional model is that it assumes that *firms* make cost-cutting decisions. This assumption treats the firm as an individual entity, with its own mind (DeCanio 1993). Under this assumption, the firm is presented with decisions, and the mind of the firm will make impersonal rational decisions. In reality, firms are made up of departments, which are made up of individuals, and within the firm, there are hierarchies. The firm making a decision really consists of an employee at a higher level (an executive) giving approval to a proposal from employees at a relatively lower level (a project manager), which itself is often created by even lower employees (analysts and engineers). This gives us another two dimensions of split incentives. A decision to retrofit means an individual employee has to take responsibility for the project, and if the project does not meet management expectations, project "champions" face negative consequences, often even losing their jobs, while champions of successful projects experienced no personal benefits (DeCanio 1994; Maiorano 2018). This hierarchy represents the "vertical axis" of intra-firm split incentives.

Workers are also encouraged to maintain the status quo and not advocate for efficiency through the lateral segmenting of departments. In a "business as usual" scenario, the energy bills are paid systemically by one department, while implementing efficiency measures requires cross-department collaboration, causing more work for everyone involved, in order to save on operational expenses which, ultimately, do not benefit those who put in the work to accrue the savings. For these employees it is thus preferable to just "let the accounting department process unnecessarily high energy bills month after month than to undertake a big retrofitting project, particularly if their job has nothing to do with facility management" (Mooney 2023). Further, upsetting the business status quo can upset the balance of power between departments, with departments opposing efficiency projects for intra-firm political reasons. These lateral divisions represent the "horizontal axis" of intra-firm split incentives.

The Last Dimension: Time

The fifth and final dimension of this framework is time. As stated by the anonymous director of finance in the early days of energy services, nonessential projects have to have a payback period of one year. Depending on the type of investor, this is still the case; while some dedicated real estate companies may allow for a payback period of up to five years, this is still not enough time to pay back most retrofit projects (Benson et al. 2011; Gliedt and Hoicka 2015; Christensen, Robinson, and Simons 2018). This is because large multifamily and commercial buildings have a typical holding period of less than ten years. Compounding the short-

[4] NIMBY, or "not in my backyard," refers to local residents who oppose changes in zoning or land use which will be close to them.

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sightedness of the industry, publicly traded real estate corporations have to provide quarterly returns; real estate investment trusts (REITs) in particular are required to pay at least 90% of their taxable income as shareholder dividends each year. The rational behavior of the individuals in the commercial real estate sector, including a lot of MBAs who understand money, leads to a sector that is structured to not consider long-term investments, in efficiency or elsewhere.

A Brief Early History of the Energy Services Industry

The energy services industry was birthed in the market chaos that was the 1973 OAPEC Oil Crisis.[5] While it was inevitable that energy efficiency would eventually emerge as a common-sense way for businesses and households to save money, the near-quadrupling prices resulting from the embargo induced labor for energy efficiency's birth, bringing about something of a market transformation. The operative word here being "something," as the early energy efficiency firms were few and far between.[6] Three reasons for this are:

1. The price of oil shot up to $70/barrel, in real prices.[7] This is a typical price of oil is today. Thus, while the economics for energy services relatively improved, from a modern perspective, they rose to "normal" prices ("Crude Oil Prices - 70 Year Historical Chart," n.d.).
2. At the time, ESCOs did not have the complex demand side management (DSM) technology we have today. The technology consisted of mostly time clocks and pneumatic controls which would turn the lights off at a certain time, or decrease the HVAC energy usage at night, so there were less savings available (Bordner 2001).
3. The energy services industry quickly gained a shady reputation, as one of the first ESCOs' owners were placed under SEC investigation, several early firms failed quickly, and businesses often didn't trust the savings estimates given by these companies (Bordner 2001).

The energy services industry then began to expand in the 1980s. Two reasons for this are:

1. The DSM technology that allowed for deeper savings was now available for market rollout (Bullock and Caraghiaur 2001; Lampropoulos et al. 2013).[8]

[5] In 1973, the Organization of Arab Petroleum Exporting Countries (OAPEC) instituted an embargo on all states which supported Israel during the 1973 Arab–Israeli War, also known as the Yom Kippur War. The embargo lasted from October 1973 to March 1974. Despite the end of the embargo, prices did not go down and actually continued to rise in the following years. This period is commonly referred to as the 1973 oil crisis.

[6] Energy efficiency extends beyond just energy services. For example, the Weatherization Assistance Program (WAP) was created in 1976, spawning a national network of organizations dedicated to improving efficiency in buildings. However, this section just pertains to the private industry side of energy efficiency, represented by ESCOs.

[7] "Real prices" means prices that are adjusted for inflation (2024$).

[8] The Institute of Electrical and Electronics Engineers (IEEE) created the Load Management Working Group in 1978 to write technical papers "to provide for the effective dissemination of technical knowledge relating to the subject of load management" (Gellings 1981). Thus, the technology for deeper savings didn't begin to be developed until the late 1970s, and wasn't ready for market launch until the early 1980s.

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2. The Iranian Revolution of 1979 caused another gigantic price spike in oil prices.[9] This improved the economics for energy services further.

In the 1980s, a lot of new ESCOs popped up. In addition, a lot of utilities started their own affiliates which offered energy services, suggesting that these utilities were themselves embracing energy services. However, these energy services affiliates were very small and found themselves "relatively unsupported or (poorly) understood by its parent" company. In addition, the contracts required for energy services were not widely accepted by banking institutions, limiting financing abilities (Bullock and Caraghiaur 2001). So while the industry grew, it still was facing steep market challenges.

Throughout the 1990s, the electric utilities underwent deregulation.[10] Now that utilities had to compete with one another, they had an incentive to provide energy services as a selling point. Estimated ESCO revenue in the United States increased from roughly $250 million in 1990 to $2 billion in 2000 (Goldman et al. 2002). Since then, the industry has continued to grow; the most recent estimate for US ESCO revenue is just under $8 billion in 2018 (IEA.org 2018).

The 1970s: Two Parables About Rational Firm Behavior

In "A Guide to Energy Service Companies," Bullock and Caraghiaur begin with a parable:

> In the late 1970s, a small company in Texas [called Time Energy Inc.] was marketing one of the many devices that had been developed as a response to the decade's dramatic rise in energy costs. In essence, the device automated the task of turning lights and similar equipment on and off at appropriate times to save energy—a time clock. The concept was simple; the savings were compelling. In spite of the obvious savings, marketing the device was difficult because many simply doubted that the savings would actually be realized. As an innovative approach to selling the device, the president of the company began to make a different kind of offer to prospective customers. Instead of asking them to pay for the time clock up front, he asked instead that they simply give him a percentage of the measured savings achieved. Suddenly, sales accelerated, and the company that had had difficulty selling the device for $1,000 had no trouble at all persuading people to commit to pay cash amounts which were worth five times that much (Bullock and Caraghiaur 2001).

This parable presents us with something of a paradox. Why would a company prefer the more expensive price? What explanation does classic economics give us?

The first is risk aversion. If the clock does not work and the company pays up front, they will lose money. Therefore, by using the subscription model (my phrasing) they avoid the risk of losing money. Part of this risk aversion is asymmetric information. If the company knew for certain that this clock would save them money, they'd be willing to put the $1,000 down today. However, since they don't know this, they perceive the clock as being riskier than it is, and value the potential savings less.

[9] This price spike is referred to as the 1979 oil crisis. In real prices, this spike brought prices from $70/barrel (a normal 2024 price) to $140/barrel. For context, the only time the real price of oil has surpassed this was a short period in 2008, preceding the 2008 recession.

[10] Previously, utilities were given monopolies by the state, meaning that a private company was guaranteed a certain market. Now, utilities had to compete with one another for contracts with states and localities.

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The second is the cost of capital. By not spending that $1,000 upfront, the company has freed up capital that it can invest in its own operations. The company expects that the return on the $1,000 internal investment will be greater than the monthly costs of the clock. Though they will end up potentially paying more for the clock, the company expects to make even more than the subscription cost from the $1,000 investment they put elsewhere. This introduces the concept of hurdle rates: For a business to make an upfront investment, it must expect a certain level of return. Otherwise, they will opt for the safer investment that is the subscription model. Here too, asymmetric information plays a role: If they knew that the down payment was for certain the investment with a higher payoff, they would put down the $1,000 today. However, they do not know this, so the subscription model is preferable to customers.[11]

This analysis can be strengthened by the split incentive framework by looking at the relationship between the purchasing employee and the company they work for. When Time Energy Inc. reaches out to a perspective buyer, they are speaking to someone who is making a financial decision on behalf of their company. Should an employee put down company finances for a clock that doesn't work, that decision will impact them negatively. One study showed that some workers lost their jobs for championing energy efficiency investments which did not pay off (Maiorano 2018). On the other hand, if the deciding employee opts for the subscription model, there is no professional risk. Even if the company pays many more times for the clock under this model, this is unlikely to negatively impact the employee, as these costs are coming out of savings which that employee delivered to their workplace.

This is where the second parable comes in. Here, the authors quote an anonymous "president of an early ESCO":

> *Money is generally misunderstood. Many years ago, when I was directing an ESCO, I had […] a meeting with the Director of Finance at one of the nation's largest companies. When we met, he opened the meeting by saying, "Young man, I buy approximately $500,000,000 a day at a fraction over LIBOR.[12] I'm told that you think you can get money for me cheaper than I can. Obviously, I can't afford to ignore anyone from a credible source who says he can get money cheaper than I do, but you'll understand my skepticism of your claims. You've got 30 minutes to convince me."*
>
> *[…] I explained that we were talking about two different kinds of money. He was looking at the cost of short-term capital to him. I was talking about the cost of long-term capital to his organization. […] I observed that in the past year (we had been trying unsuccessfully for over 2 years to get a project with this company), our company had been told that any project having a payback of more than one year would not be funded. He confirmed that. I then said that during the past 5 years, we had been told that the average hurdle rate for nonessential projects had exceeded 35% per annum. He confirmed that. Then I simply said that had his company accepted our proposals for projects which could not be funded internally using that criteria, we would have implemented many millions of dollars worth of projects. Moreover, as shared savings projects, they would have generated free cash flow for his company. […] I also observed*

[11] A third explanation for the preference of a subscription model is that the company cannot finance a downpayment on the item. However, as the Time Energy Inc. clock was $1,000 in the 1970s, meaning around $6,000 today, this likely does not apply here.

[12] The London Interbank Overnight Rate is the rate at which banks lend money to each other overnight.

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that only half of the projects that met his company's internal hurdle rates had actually been funded during the past 5 years. I said that had his company accepted our proposals, we would have been happy to have funded those projects.

[He replied] "You know, you're right. And that happens as a natural consequence of imposing capital rationing and the types of financial controls we require to run this large organization. We really should use as much of your money as we can get. The problem is that we have financial and purchasing controls which filter out smart alecks like your company. In doing so, we cut ourselves off from a resource which could probably deliver a lot of value to us. In order to do business with you, we have to change some of those controls."

The authors then comment, "The moral of this story is that even people with MBAs from prominent universities often misunderstand money" (Bullock and Caraghiaur 2001).

To expand this moral, there is a difference between short-term lending and long-term investment which the traditional business intelligence can't capture. Just using an annual payback rate makes efficiency seem not worth it, but when you can sit down and explain to someone that investing in efficiency allows you to take money you would have spent on energy and invest it back into the business, even a skeptical executive who calls you "young man" and a smart aleck can be convinced. The cost of capital alone is not a good enough indicator to evaluate an investment in efficiency; however, the operation of a company of that size requires capital controls that exclude efficiency investments.

In the first parable, the traditional economic analysis says that firms rationally prefer the subscription pricing model in which they end up paying more over time. This preference is rational because of the upfront cost of capital. In the second parable, however, we learn that the cost of capital alone isn't enough to evaluate an efficiency investment, because it doesn't consider the fact that, by lowering operational expenses, the firm can invest further into its operations and get even higher returns.

If the cost of capital doesn't fully justify the market's preference for the subscription model, what does? The traditional economics explanation is market failure due to asymmetric information. In the words of the authors, MBAs often don't understand money.

I think that MBAs (usually) do understand money, and are not acting irrationally in their valuations of energy efficiency. Rather, it's that executives making the investment decisions have jobs to keep and professional reputations to maintain. The risk aversion here isn't on the part of the company; it's on the part of the employee.

In this story, the ESCO president was able to sell the director of finance on his pitch and went on to do millions of dollars' worth of business with the company. However, the director first had to meet with the corporate controller office to make an exception for the ESCO and other firms like it. Here we have the horizontal organization of firms as the impediment, as extra work has to be taken, both on the part of the ESCO president meeting individually with the director of finance and the director of finance getting his company to make an exception. Also, should the relationship between the company and the ESCO sour, the director of finance will be wholly responsible as the executive which directed the company to make an exception. Even for a high-ranking executive, the vertical organization of firms still impacts their behavior.

The 1980s: Inter-Sector Incompatibility and Intra-Firm Politics

In the 1980s, a struggle for ESCOs was that many of the contracting mechanisms they used were not accepted by the banking industry. This was the start of a long history of the banking industry

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not adopting practices which would allow for greater proliferation of energy efficiency. From this time, countless methods of energy efficiency valuation have been proposed in academic journals and stayed there; legislation that would require considering efficiency in financing has stalled in Congress; financing techniques that would lessen the downpayment cost of building audits have gone undeveloped (Mooney 2023).

The classic economic analysis of this attributes the mismatch to transaction cost. To get the business of the energy services industry, the financial industry would have to propose new contracting mechanisms and get them approved by regulators; it would have to develop new forms of financing. All of this takes time and money, and in the 1980s, energy services lending was a relatively insignificant business opportunity. While the banking industry has progressed a lot since this time and is much more compatible with energy efficiency financing, it remains leagues behind the methods that are available to it and remains a key barrier listed in studies of the scaling of efficiency. In this analysis, the rational behavior of the banking industry leads to decades of unrealized efficiency because of market failure.

The resistance to change in the financial industry is analogous to the parable of the clock. In both instances, the actor forgoes a down payment ($1,000 for a clock/a deep investment in energy efficiency lending) for a lower stream of revenue (split savings with Time Energy Inc./less business with the energy services sector) to avoid risk. A huge difference is that, in the case of the clock, the conflicting interests are that of the purchasing employee and the company they work for. In the case of the finance industry, the conflicting interests are between industries.

Similar to the conflicting interests between industries is the conflicting interests between departments within firms. In the 1980s, as discussed, many of the new ESCOs were affiliates of utilities which found themselves at odds with their parent company. This persists throughout the energy services literature as a challenge; since incorporating efficiency requires extra work and collaboration between departments which may not typically interact, maintaining the status quo and letting the inefficiency continue is the easier option. The 1980s were only the start of intra-firm conflicts preventing energy efficiency, with the literature containing numerous examples through the decades.[13]

Another barrier to energy efficiency in the 1980s was that utilities had (little to) no incentive to provide energy efficiency to their customers. Before the days of regulation, utilities had state-granted monopolies, meaning private companies had the guaranteed business of entire states. Therefore, the more energy they sold, the better off they were, de-incentivizing efficiency. While there were regulations preventing profligate waste, nothing was requiring them to seek efficiency other than maintaining positive customer relations and the strategic benefit of load management. Still, it is very telling that the explosion of energy services took place in the 1990s following deregulation, once costing their customers as much as possible was no longer a viable business strategy. This is an example of the vertical split incentive, where the interests of the company conflict with their direct customers'.

Energy Efficiency is Analogous to the Environment

Energy efficiency and the environment have always been related, though this relationship has not always been explicit. While energy efficiency has a clear environmental benefit, it is most often sold as a cost-saving measure, with the environmental benefit as being a "soft"

[13] Examples of this in the literature appear in Cebon (1992), DeCanio (1993), DeCanio (1994), Curtis, Walton, and Dodd (2017), and Maiorano (2018).

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feature. In recent years, companies' desire to publish climate goals has allowed for more adoption of energy efficiency, though this has not resulted in market transformation.

In this section I will argue for a theoretical framework to view energy efficiency and the environment as analogous to one another. While energy efficiency is constrained by the split incentive, the environment is continually threatened by the modern industrial economy through the externality. This framework of viewing the split incentive between landlords, tenants, utilities, contractors, banks, and so forth as being analogous to the externalities of environmentally destructive practices has two practical benefits. The first is that tying split incentives with externalities allows the environment to be understood more in economics terms, as opposed to an "invaluable resource" which can ultimately be ignored in economic decisions. The second is that it allows energy efficiency to be more explicitly environmentalist. Any distinction between efficiency and the environment is harmful, as it allows both concepts to be easily ignored in favor of the more pressing matter of capital accumulation by businesses. By combining them with economic theory, it allows both ideas to be stronger as a single entity.

Split Incentives as an Analogue to Externalities

An externality is an unintended negative consequence of an activity which the creator is not responsible for. Littering is an externality because the producer of plastic forks is rightfully not responsible for people throwing their used plastic forks on the ground. On a larger scale, the habitat destruction of industrial logging may not be understood until years later, and even then, putting a dollar amount on the ecosystem services of the animals in that habitat is carefully crafted guesswork at best, and even then, only values the practical impacts animals have on the economic activity of humans. As a result, externalities are impossible to estimate and, even with the most rigorous enforcement, can end up as simply a cost of doing business.

Unlike the externality, the split incentive is passive. Its destruction does not come about by manufacturing a good or exploiting and altering an environment; it occurs because (for example) the guy working in operations doesn't want to take on the onus of calling up contractors to see how the business can save a marginal amount on air conditioning, especially if the operations guy is only going to be in this job for a few years and knows that if this project is a failure they can get fired. However, these passive impediments to lowered energy use compound one another and are the reason that energy efficiency is not an integral part of business decisions fifty years after its introduction to the industrialized economy.

Why This Analogy is Useful, and Why This Analogy is Useful Now

In practice, energy efficiency and environmentalism exist in very different spaces. To start, energy efficiency is often named in the marketplace as energy services, provided by profit-seeking businesses and often as affiliates of utilities which themselves are huge fossil fuel customers which support efficiency opportunistically and strategically. Other purveyors of efficiency are manufacturers of efficient technologies such as heat pumps and solar panels. The term "efficiency" is also used by industries which have dubious connections to it, such as petroleum companies which tout the efficiency of enhanced oil recovery.[14]

[14] This is a process whereby carbon dioxide is injected into spent oil wells to extract more oil, thus reducing the need for drilling more wells to get the same volume.

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On the other hand, environmentalism advocates generally for the appreciation of nature's value outside the concept of profit. Though economic impact analyses are part of economic decision making, and are typically conducted by people who would themselves identify as environmentalists, they are not the environmental movement's first line of defense when arguing for the need for environmental protection. Environmentalism has increased its sense of urgency in recent years with the worsening of anthropogenic climate change and increasingly dire predictions by the scientific community. Energy efficiency, by nature of its position as a value proposition by profit-seeking businesses and as a nonprofit sector funded by profit-seeking businesses, their related philanthropic foundations, and government agencies, has constraints which do not allow for such a sense of urgency. Therefore, a new urgency for energy efficiency must take a different form.

Improving Analyses with This Framework: Propositions for the Commercial Real Estate Sector

What does a new sense of urgency for energy efficiency look like, and how does it improve the overall movement of energy efficiency? As I argue here, it means naming in our analyses that the structure of the modern industrial economy is incompatible with widespread efficiency, and only selectively adopts efficiency measures when individuals' incentives happen to line up with one another.

In Mooney (2023) I argue that providing useful recommendations to utility programs and other partners requires understanding this. In the report, I provide recommendations which are designed to work with the many, conflicting interests of market players, rather than fighting against them. The goal of these recommendations is to rejoin the incentives, making it so that actors at different points in the value chain can view efficiency as a common goal which they can work together to achieve, as opposed to a project one market actor takes on to the oblique indifference of the others. Below I summarize three central recommendations:

One recommendation is for programs to target the existing frameworks that businesses use to cooperate. Business Improvement Districts (BIDs) are partnerships of businesses in downtown areas which have funds to spend on improvements. To form a BID, property owners in an area agree to form a self-taxing district and a nonprofit organization which administers the BID. The BID fees are collected as taxes and returned to the BID organization, which decides how to allocate the funds. Currently, there is not a framework for utilities to contract directly with BIDs. While this would be a large undertaking for any utility, BIDs offer an opportunity to work with many businesses at once and significantly scale efficient operations.

Greater transparency in permitting processes can allow for greater outreach from program administrators. Periods between tenants and times of renovations are the easiest times to retrofit a building (Curtis, Walton, and Dodd 2017; Mathew et al. 2019). Most of these periods are not taken advantage of, as these times are not publicly known. Providers could target their outreach if the turnover of buildings was more public. Periods of turnover could also be targeted without government intervention: real estate brokers could form partnerships with contractors in order to act as one-stop shops, where purchasers of a building could have as part of their deal a retrofit installed prior to them moving in.

Utilities which develop efficiency programs are constrained by a lack of lending ability. They are not banks, but they wish to incentivize businesses to undergo capital improvements. This capacity building can be facilitated by forming partnerships (joint ventures or otherwise)

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with community development financial institutions (CDFIs) which wish to implement capital improvements in an area but are constrained by their amount of funding. This recommendation to utilities and CDFIs recognizes the difficulty each has in their operations and shows how these two actors can cooperate implement efficiency with as little friction to their business model as possible.

Conclusion

The histories of ESCOs, energy efficiency, and environmentalism are all, to varying degrees, elaborate parables of negative externalities. Each is a collection of stories of people trying to reduce waste and preserve the natural resources only to be told that doing so would be too expensive and would require too many resources. For the ESCO manager, energy efficiency champion, and environmentalist, this presents a paradox: how is the saving of resources constrained by the availability of resources? Why is the enemy of energy efficiency the idea of market efficiency?

History provides some needed perspective. It is very easy to look at businesses' hurdle rates and see it as the latest challenge which can be overcome in the next few years with some more informational documents and in innovative financing instrument. Understanding it as an unchanging 50-year problem gives us a more realistic framing to move from. Taking this historical view and a different approach to understanding value chains provides us with a direct answer to the paradox: that the very structure of the modern industrial economy is indifferent to efficiency, energy or otherwise. Adoption of efficiency requires a type of "coincidence of wants," which traditional economic education teaches is a market failure of the barter economy.[15]

While this thinking is instrumental to environmentalist thought, its heterodox implications prevent its adoption by the study of energy efficiency. However, the acceleration of anthropogenic climate change, which has brought new urgency to environmentalism, should bring new urgency to energy efficiency as well. Doing this means understanding the constraints of the structure of the modern economy and working with them, rather than against them. Taking this view can both improve analyses and push the study of energy efficiency to the level of urgency required for this moment.

[15] The "barter economy" is taught in introductory economics classes, though there is no historical proof of it. To the contrary, moneyless societies which do not follow a barter system are the rule in human history. For more, see "The Myth of Barter" in Graeber (2014).

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