

Case Study

**Australia Clean Energy
Finance Corporation
Environmental Upgrade
Agreements**

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Executive Summary

This case study has been prepared to explain Environmental Upgrade Agreements (EUA), a deal structure employed in Australia to address market inefficiencies that have prevented broader deployment of energy-efficiency technology.

Like many countries, Australia has a large existing building stock that is responsible for a substantial percentage of its greenhouse-gas emissions. Given that it will take decades for these buildings to be replaced, the rigorous standards developed in recent years for new buildings do not address much of the existing carbon emissions.

In the face of the long replacement time, focus has shifted to retrofits and upgrades to existing building stock. This would both reduce the amount of greenhouse gases that these buildings emit and reduce their operating costs.

While these energy-efficiency upgrades are often cash-flow-positive with the right loans, they have failed to penetrate the market to the expected degree. Misalignment of incentives and perceived project risk are responsible for this underinvestment.

Building owners and tenants do not always share reduced energy costs in a way that incentivizes owner investment. Financial institutions are reluctant to lend when any claim that they might make in the event of a default is junior to the property mortgage holder.

This is why the Environmental Upgrade Agreement (EUA) plays an important role.

The EUA is a deal structure modeled on property-assessed clean energy (PACE) in the United States. It allows loans for building upgrades to be paid back via a surcharge on local property taxes. This increases the security of the repayment and is senior to the mortgage, providing the incentive necessary to attract private finance.

The EUA also addresses the misalignment of incentives by creating an Environmental Upgrade Charge (EUC) that allows a property owner and a tenant to more equitably share in both the investment cost for energy-efficiency upgrades and the subsequent cost savings.

Problem

Despite the substantial benefits to building-energy-efficiency upgrades, ranging from cost savings to sustainability reputation, many building owners across Australia have not yet retrofitted their buildings to attain maximum efficiency.

Even though building upgrades make sense, property owners are unable to carry them out because upfront costs are too high. The combination of upfront costs and long payback periods mean that without outside financing, property owners are simply unable to afford building retrofits and upgrades.

In most settings, building owners would be able to seek outside financing for investments that are cash-flow-positive immediately and have a positive net present value.

Here too, though, they encounter difficulty. Building upgrades are essentially worthless if removed from a building (i.e., insulation cannot be reused if removed from a building). Lenders are making unsecured loans when they lend for building upgrades. Thus, their claims on the property, building, or assets are limited in an enforcement scenario.

Even when lenders can secure their loans by placing claims on the buildings, the mortgage holders typically have seniority on all other forms of debt in an enforcement scenario. When an owner can get financing in such a scenario, they are unable to do so at rates that are competitive enough for it to make sense for them to bother with the effort and expense.

Further complicating the picture for property owners is the question of whether they will realize the full benefits of the upgrades.

If they sell the properties at some point, it may not be clear that the property value will fully reflect the upgrades. They have paid the upfront cost without recovering the full value from reduced operating expenses or increased sale prices.¹

Further reducing property-owner willingness to undertake retrofits is what is known as the “split incentive,” which occurs when the tenant pays the energy bill instead of the property owner.

In this circumstance, since the owner is not paying the energy bills, he or she does not receive any of the benefit of the lower energy bills that the retrofit creates.

Instead, the tenant reaps the benefit of the upgrades without having contributed to the upfront retrofit cost.

¹ Green Bank Network. “Lien-Based Commercial Energy Efficiency Financing.” Retrieved from <http://greenbanknetwork.org/lien-based-commercial-energy-efficiency-financing/> on July 15, 2017.

At the same time, tenants have no incentive to invest in building energy-efficiency measures, as they do not own the properties, so they cannot guarantee that they will be able to capture enough of the benefits to make their upfront investments worth it.

OWNERS

- Seek to maximize profits
- Want to increase property value
- Want to benefit from property improvements
- Want to remain cash-flow-positive

COMMERCIAL BUILDING TENANTS

- Achieve their sustainability goals by greening their office buildings
- Want to save money on energy
- Want more comfortable and healthier indoor environments
- Don't want to invest in properties they do not own

COMMERCIAL FINANCIERS

- Want low-carbon projects to diversify investment portfolios
- Want to gain access to new markets with reasonable returns
- Concerned about limited recourse for building-improvement loans

This misalignment and apparent inability to share the costs for joint benefits—higher property values for owners and lower energy bills for tenants—is at the heart of the split incentive.

Disregarding all other issues associated with building retrofits, this split incentive is a pernicious misalignment. If it remains unresolved, it will prevent countless upgrades that otherwise have a strong financial benefit.

This adjoining table summarizes the various views that different stakeholders bring which, in aggregate, undercut the ability of property owners to obtain financing for building upgrades.

Thus, we see that without the proper alignment of incentives, building upgrades are not tenable, even when cash flow is positive from day one.

For commercial markets, these assumptions have been called into question by some research

from Carleton University which shows that tenants are in fact willing to pay higher rents after energy-efficiency upgrades occur.² However, landlords and other stakeholders appear to often be unaware that this may be the case. Similar research has not taken place for the residential market.

The next section delves into one way that Australia has found to properly align incentives and drive the deployment of energy-efficiency technology.

² Hanna, M. (2015.) *Split incentives may not reduce commercial energy efficiency's value*. Retrieved July 5, 2017, from <http://www.cleanenergyfinanceforum.com/2015/08/28/split-incentives-may-not-reduce-commercial-energy-efficiency%E2%80%99s-value>

SITUATION

While rarely garnering as much attention as renewable-energy generation, improvements to energy efficiency in the built environment have the ability to dramatically reduce global carbon emissions.

From old furnaces to poorly insulated walls and inefficient lighting, building-maintenance issues are responsible for both direct and indirect contributions to carbon emissions.

Underscoring this is the fact that buildings account for 40% of the energy consumption and 30% of the CO₂ emissions globally.³ When one considers the enormous strides that building-efficiency technology has made towards making buildings carbon-neutral, it is clear that more can be done.⁴

While Australia's building stock is somewhat more efficient than the global average, buildings in the country still accounted for 24% of indirect greenhouse-gas emissions in 2007–2008. This does not include direct emissions from building furnaces.⁵

At both the national and state level, the Australian government has realized that buildings must be an important part of the strategy to achieve the country's lofty CO₂ emissions-reduction goals of 28% under 2005 levels by 2030. This would go along with the country's goal of reducing its energy intensity by 50% by 2030.⁶ Energy intensity is defined as units of energy per unit of GDP in a given country.

Of particular consequence when it comes to building stock emissions are commercial buildings. Australian commercial buildings such as hospitals, schools, retail facilities, etc. consume 12% of all stationary energy in the country.⁷

A recent study highlighted some of the immediate opportunities that upgrading these buildings could offer in the drive to address global warming. The study concluded that Australia could reduce its building-stock emissions by 12% compared to its 2007–2008 emissions with appropriate building retrofits.⁸ The figure below, from the Melbourne Energy Institute, provides additional detail on the impact that emissions-reduction measures could have on existing building stock.

3 UNEP Sustainable Building and Climate Initiatives. (2009.) *Buildings and climate change – summary for decision makers*. Retrieved July 17, 2017 from <http://www.unep.org/sbci/pdfs/SBCI-BCCSummary.pdf>

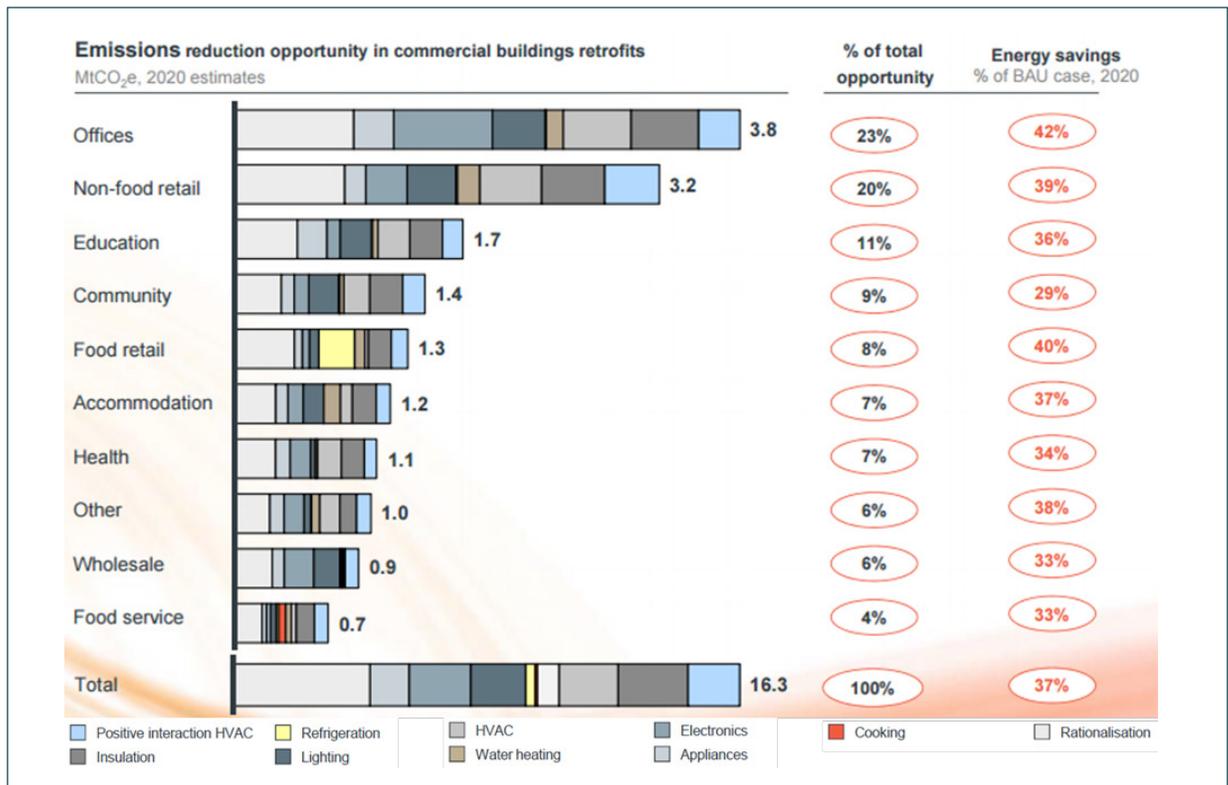
4 Passive House Institute US. *What is passive building?*, Retrieved July 15, 2017 from <http://www.phius.org/what-is-passive-building>

5 World Resources Institute. *GHG mitigation in Australia: An overview of the current policy landscape*. Retrieved July 15, 2017 from http://www.climateinstitute.org.au/verve/_resources/TCIWRI_WorkingPaper_Australia.pdf

6 Australian Government: Department of the Environment and Energy. *Australia's 2030 emission reduction target*. Retrieved July 15, 2017 from <http://www.environment.gov.au/climate-change/publications/factsheet-australias-2030-climate-change-target>.

7 Australian Government: Australian Trade Commission, Clean Energy & Environment Team. (2010.) *Australian energy efficiency market: Industry capability report*. Retrieved July 17, 2017 from <http://di.dk/SiteCollectionDocuments/Markedsudvikling/2%20Australian%20Energy%20Efficiency%20Industry%20Capability%20Report.pdf>

8 ClimateWorks Australia. (2010.) *Australian carbon trust report: Commercial buildings emissions reduction opportunities*. Retrieved July 17, 2017 from http://www.climateworksaustralia.org/sites/default/files/documents/publications/climateworks_commercial_buildings_emission_reduction_opportunities_dec2010.pdf



Not only do these commercial buildings have an impact on greenhouse-gas emissions throughout Australia, but they cost taxpayers money.

The Australian government occupies more than 25% of the country’s commercial buildings and must pay upward of \$450 million AUS for the energy and water that these buildings consume.⁹

The Energy Efficiency Council estimates that the appropriate retrofits to these buildings could yield a reduction in energy usage of between 25% and 50%, with associated cost savings of over \$2 billion AUS over 25 years.¹⁰ This is especially important when one considers that between 2007 and 2013, energy prices rose by more than 70% in Australia.¹¹

In addition to the emissions reductions and cost savings, the public is now demanding that companies increase their environmental performance. Most large companies have started to report their environmental performance, creating a welcome increase in transparency but also spurring further calls for action.¹²

9 Energy Efficiency Council. *Plan for affordable & efficient energy*. Retrieved July 15, 2017 from <http://www.eec.org.au/uploads/images/Policy%20and%20Projects/Final%20Plan%20for%20Efficient%20and%20Affordable%20Energy.pdf>

10 Ibid.

11 Melbourne Energy Institute. (2013.) *Zero carbon Australia – Buildings plan*. Retrieved July 15, 2017 from http://media.bze.org.au/bp/bze_buildings_plan.pdf

12 Ibid.

Thus, building tenants (often the aforementioned companies) are starting to care more about what buildings they rent. Recent surveys suggest that Melbourne’s commercial property owners now consider sustainability a key factor in attracting and retaining tenants.¹³

Given these considerable benefits that energy efficiency provides, deployment of such technology is starting to gain wider acceptance across the country. Robin Mellon, Chief Operating Officer of Australia’s Green Building Council, said, “We know the built environment can deliver rapid and cost-effective reductions to emissions and energy consumption using technologies and approaches that are widely available today.”¹⁴

STATE	SCHEME	TARGET(S)	DESCRIPTION
NSW	Energy Savings Scheme (ESS)	<ul style="list-style-type: none"> Expresses annual targets as percentage of annual NSW electricity sales Scaling up from 0.4 (2009) to 4.0% (2014) 	<ul style="list-style-type: none"> Commenced July 1, 2009 and will continue until 2020 or until a national scheme is introduced Covers electricity only Includes residential, commercial and industrial
South Australia	Residential Energy Efficiency Scheme (REES)	<ul style="list-style-type: none"> Expresses annual targets as tons CO₂ abated Scaling up from 155,000 (2009) to 410,000 (2014) Requires 35% of the target must be achieved within low-income households 	<ul style="list-style-type: none"> Commenced January 1, 2009 Covers electricity and gas Includes residential only—35% must be from low-income households
Victoria	Energy Saver Incentive Scheme (ESI)	<ul style="list-style-type: none"> Expresses annual targets as Mt CO₂ abatement Requires 2.7/year (2009–11); 5.4/year (2012–14) 	<ul style="list-style-type: none"> Commenced January 1, 2009 and will continue in three-year phases until January 1, 2030 Covers electricity and gas Includes residential and commercial
ACT	Energy Efficiency Improvement Scheme (EEIS)	<ul style="list-style-type: none"> Expresses annual targets as percentage of total electricity sales Scaling up from 7% (2013) to 14% (2015) Requires 25% of the target must be achieved within low-income households 	<ul style="list-style-type: none"> Commenced January 1, 2013 and will be reviewed in 2014 Covers electricity (target base) and gas (savings) Includes residential and commercial—25% must be from low-income households

¹³ Melbourne Energy Institute. (2013.) *Zero carbon Australia – Buildings plan*. Retrieved July 15, 2017 from http://media.bze.org.au/bp/bze_buildings_plan.pdf

¹⁴ Ibid.

Thus, Australia has started to steer building stock to lower energy consumption via a host of efficiency goals. At the national level, the National Australian Built Environment Rating System (NABERS) exists to benchmark building efficiency and provide owners and tenants with an understanding of how efficient their buildings are relative to others.¹⁵

NABERS ratings are now a common topic of discussion in the Australian real-estate market.¹⁶

Furthermore, states have begun pursuing greater energy efficiency, with a host of measures documented in the above table from World Resources Institute (WRI).

However, in spite of these programs, WRI notes that energy-efficiency implementation has failed to have as much of an impact as it could have. This is a result of policies' limited or low standards and the slow rate at which new buildings that achieve the higher standards are replacing existing buildings.¹⁷

Given the fact that new building stock is not being built as quickly as is required to effectively drive down emissions and capture the opportunities that energy efficiency offers, one must look to building retrofits and renovations as a means of increasing the efficiency of existing building stock.

It is estimated that over 80% of Australia's building stock is greater than 10 years old, with an associated need for retrofits.¹⁸ However, such retrofits are expensive. In Melbourne, the average cost of an energy-efficiency-building retrofit is approximately \$340,000 AUS per building, with a smaller percentage exceeding \$1 million AUS. Even though there are cost savings attached to these retrofits, the upfront costs present a barrier for building owners.

Building owners and sustainability planners are not the only ones increasingly looking to building retrofits. The contractors are also eager to conduct more building retrofits. Some estimates forecast the size of the energy-efficiency-retrofit industry will be near \$100 million AUS by 2020 in New South Wales alone.¹⁹

The Australian Energy Efficiency Market Industry Capability report notes that some of the most common energy-efficiency measures that are being undertaken include changes to a building's heating and ventilation systems, air conditioning, building management, energy storage, and solar systems, among others.²⁰

15 National Australian Built Environment Rating System. Retrieved July 15, 2017 from <https://nabers.gov.au/public/webpages/home.aspx>

16 National Australian Built Environment Rating System, *An introduction to NABERS*, Retrieved July 15, 2017 from <https://www.nabers.gov.au/public/WebPages/ContentStandard.aspx?module=10&template=3&include=Intro.htm&side=EventTertiary.htm>

17 World Resources Institute. *GHG mitigation in Australia: An overview of the current policy landscape*. Retrieved July 15, 2017 from http://www.climateinstitute.org.au/verve/_resources/TCIWRI_WorkingPaper_Australia.pdf

18 Clean Energy Finance Corporation. *Finance for environmental upgrade agreements factsheet*. Retrieved July 15, 2017 from https://www.cleanenergyfinancecorp.com.au/media/76243/cefc-factsheet-nab-cefc-ef_eua_lr.pdf

19 Bertone, E.; Sahin, O.; Stewart, R.; Zou, P.; Alam, M.; and Bair, E. (2016.) *State-of-the-art review revealing a roadmap for public building water and energy-efficiency retrofit projects*. International Journal of Sustainable Built Environment. Vol. 5, Iss. 2, pp. 526–548

20 Australian Government: Australian Trade Commission, Clean Energy & Environment Team. (2010.) *Australian energy efficiency market: Industry capability report*. Retrieved July 15, 2017 from <http://di.dk/SiteCollectionDocuments/Markedsudvikling/2%20Australian%20Energy%20Efficiency%20Industry%20Capability%20Report.pdf>

Solution

The Clean Energy Finance Corporation (CEFC) is a government entity established in 2013 with the goal of promoting deployment of renewable energy, energy efficiency, and low-emissions technology. Its \$10 billion AUS in funding comes from the Australian government, though it has an independent board of directors and is staffed with employees with private-sector experience in cleantech or banking. It has a portfolio that includes direct debt and project equity. It also includes loans to government entities for carbon-related instruments.

Sustainable Melbourne Fund: Another EUA Player

Melbourne is a historically progressive city in the southeastern Australia state of Victoria. The Sustainable Melbourne Fund (SMF) is a fund capitalized by the City of Melbourne Council with the goal of conducting EUA deals in Melbourne and broader Victoria.

SMF is separate and distinct from CEFC and Eureka Funds, meaning that a property owner in Victoria has a choice of which entity to engage with to obtain an EUA. The CEFC provided the city of Melbourne Council with \$10 million AUS to help capitalize SMF, though it has no role in the administration of the fund.

The continued existence of the CEFC has at times been a contentious issue in Australia politics. After being founded under the leadership of a labor government (the more progressive of the two major Australia political parties), the CEFC has withstood two attempts by the Liberal Party of Australia (the more conservative of the two major parties) to dissolve it.

One of the main points that the Liberal government has made is that the CEFC, despite being founded to catalyze new technologies, is investing in mature technologies that should be able to secure private financing.²¹

Energy efficiency, though, exists at a unique intersection of proven technology with simultaneous financing-market failure.

The Environmental Upgrade Agreement (EUA) is one of the portfolio vehicles that the CEFC uses to drive deployment of low-carbon technology in the face of private finance-market failures.

ENVIRONMENTAL UPGRADE AGREEMENT

The EUA structure was first brought to market in Australia in 2011 by Low Carbon Australia, a predecessor government entity to CEFC. The EUA was established as an Australian analogue to the PACE structure used in the United States. It works by addressing the main obstacle that debtors face in securing finance for energy-efficiency upgrades—the problem that lenders are hesitant to offer competitive rates for a non-collateralized property upgrades.

The money lent for EUA upgrades is paid back via an increase in the rate charge that the owner pays to the local government council on the land. Because the loan repayment is collected via taxes, and because taxes are typically paid before all other debts or bills, lenders have a higher degree of confidence that the debtor will not default.

21 Medhora, S. (2015.) *Coalition bans government's clean energy bank from financing wind power*. The Guardian. Retrieved July 15, 2017. <https://www.theguardian.com/australia-news/2015/jul/12/coalition-bans-clean-energy-finance-corporation-wind-power-investment>

Additionally, since the charge is on the property, it is survivable beyond any one owner. These factors reduce the likelihood of default and provide certainty in case enforcement becomes necessary. The local council is then responsible for passing along payment to the EUA lender. As a result of this deal structure, lenders are more willing to provide financing at competitive rates than they would be otherwise.

Typical EUAs: What Technology Is Used

While EUAs differ, the funds are typically used to upgrade technology in one of the following areas:

- Building Envelope
- Lighting
- HVAC
- Building Management Systems
- Elevator Equipment
- Trigeration

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At present, the legislation required to bring an EUA to market has been passed in three Australia states—New South Wales, Victoria, and, recently, South Australia.

In order for a property owner to receive an EUA, he or she must be in one of the three aforementioned states.

The local council must have also adopted the EUA deal structure. Local council adoption is often dependent on the sophistication of the council administration (and its corresponding ability to manage the EUA). It also depends on demand for EUAs from within the council's constituency (and how effectively property owners within the constituency lobby the council).

These two factors likely correlate, as the more likely a constituency is to have a high amount of energy-intensive building stock, the more likely it is to have jurisdiction has a sophisticated council presiding over a prosperous municipality.

However, this means that buildings that are ideal candidates for EUA but do not have built-in councils that support the EUA structure are unable to gain access to the reduced cost of capital for building retrofits.

The CEFC has brought the EUA structure to market via a fund structure that allows for private-sector participation. The CEFC and private investors contribute equally to a fund that originates and executes EUAs.

At present, the private investors involved are National Australia Bank (NAB) and Australia and New Zealand Bank Group (ANZ Bank).

The money contributed is then administered by Eureka Funds, a private fund manager recently acquired by European real estate investor AXA. Eureka Funds is responsible for all direct interaction with council governments and property owners seeking EUAs, along with origination of EUA opportunities.

ENVIRONMENTAL UPGRADE CHARGE

In an interesting departure from how PACE loans are administered in the United States, EUAs have provisions for an Environmental Upgrade Charge (EUC).

This EUC is a recurring payment made to the property owner by a renter who benefits from an EUA. The creation of provisions for the EUC is quite effective, as it eliminates the aforementioned split incentive.

In the absence of the EUC, the incentive to undertake a retrofit would be lost, since the property owner would not benefit from a lower energy bill, while the tenant would benefit from contributing to the associated costs.

The EUC solves this by providing a mechanism for the property owner to receive payments from the renter to compensate them for their investment. The payment is structured to be less than the commensurate reduction in energy costs that the renter experiences.

The EUC provision in EUA legislation requires that the tenant be “no worse off.” This means that when the building owner is calculating the size of the EUC, he or she must calculate the expected energy reductions before determining the size of the EUC.

If the EUA is still being paid off when the tenant leaves, the building owner offers a lease that incorporates the cost that the EUC had been covering so that subsequent tenants pay slightly higher rent, but no EUC.

Interestingly, the EUC is structured differently in the states that allow EUAs. In New South Wales, tenants can be obliged to pay the EUC, though in Victoria, they must consent for an EUC to be levied. In South Australia, at this time, it has not been decided whether renters will be obliged to pay the EUC or whether they must consent.

<p>OWNERS</p> <ul style="list-style-type: none"> • Seek to maximize profits • Want to increase property value • Want to benefit from property improvements • Want to remain cash-flow-positive 	<p>EUAs ADDRESS THESE CONCERNS THROUGH</p> <ul style="list-style-type: none"> • Lower-cost capital access for building improvements • Tax-based repayment that can be passed on if property is sold • Split-incentive prevention through the EUC structure
<p>COMMERCIAL BUILDING TENANTS</p> <ul style="list-style-type: none"> • Achieve their sustainability goals by greening their office buildings • Want to save money on energy • Want a more comfortable and healthier indoor environment • Don't want to invest in property they do not own 	<p>EUAs ADDRESS THESE CONCERNS THROUGH</p> <ul style="list-style-type: none"> • Reduced energy bills • EUC structure to eliminate split incentive • Increased access to sustainable environments
<p>COMMERCIAL FINANCIERS</p> <ul style="list-style-type: none"> • Want low-carbon projects to diversify investment portfolios • Want to gain access to new markets with reasonable returns • Concerned about limited recourse for building-improvement loans 	<p>EUAs ADDRESS THESE CONCERNS THROUGH</p> <ul style="list-style-type: none"> • Highly secure returns that are senior to mortgage loans • Flexible creation of deal structure that is scalable across a large market

To the extent that there are performance guarantees on building improvements, they occur between the property owners and the contractors. Thus, if the improvements made under the EUA do not yield the expected savings, there is the possibility that the contractors could have to pay the property owners damages, as the property owners would be responsible for repaying the cost of the EUA to the council whether or not the expected savings materialize.²²

The EUA deal structure provides a number of benefits that ultimately are what allows the EUA to make deals work in circumstances where they might not otherwise be viable, as this diagram shows.

There are further benefits that EUAs provide beyond those that accrue to the core stakeholders depicted above. Councils benefit because EUA deals ultimately make a building cheaper to operate, raising its value and buoying the local tax base.

Additionally, councils with sustainability targets benefit to the extent that they can claim the reduced emissions associated with the increased building efficiency.

Furthermore, contractors benefit from the fact that there are projects that are being developed that might not otherwise be done, increasing the market for their services.

The alignment of benefits is how Eureka has been able to commit \$40 million AUS since the CEFC has begun funding EUAs. Seven deals have been completed, creating a committed value of approximately \$16 million AUS. Notwithstanding one exceptionally large EUA, the average deal size is about \$1 million AUS.

22 Knowles, T.; Greenop, P.; Pepperall, Y. (2016.) Personal Interview with Clean Energy Finance Corporation Employees.

Recommendations

Further study of the EUA is warranted given its applicability to other markets that are considering or already bringing the PACE structure to market. Key questions could focus on the following topics:

- How does Eureka engage with the market to publicize EUAs and build a pipeline? Does Eureka use different channel partners to originate potential deals?
- What is the EUA application process like? Are there factors that militate against granting an EUA?
- How involved is Eureka in auditing any expected energy savings?
- What are the key pain points that are commonly encountered during the EUA transaction process?
- What lessons have been learned so far during the EUA process? Are there changes that could be recommended as a result of them?
- Are private financiers willing to carry the EUA structure forward in the event that CEFC ceases to exist?

Additional EUA deal structures could also be studied. This might include a review of files about generic deals, documents dictating local-council compensation for administrative services, and expected cash-flow projections for all parties.

Appendix

The following pages include a series of deal diagrams, each of which emphasize a different stage in the deal life cycle.