Making the performance of buildings transparent

A low hanging policy option to save energy and carbon

Report to New Zealand Green Building Council

12 October 2021

SENSE PARTNERS
DATA LOGIC ACTION

Executive Summary

Context

Reducing energy consumption is a critical component of decarbonisation. Energy savings in the commercial building sector represent a cost-effective quick win for carbon reduction.

Evidence supports the use of a mandatory disclosure regimes for building energy efficiency. This option corrects a set of market failures to achieve lower energy consumption at a considerable benefit to the market.

This is readily implementable, at a lower cost and complexity than minimum standards. Over time, minimum standards may be necessary from a practical perspective to shore up the incentive structure, but this should come after a mandatory scheme is well embedded.

Mandatory disclosure works

A mandatory disclosure scheme applied to a buildings base energy performance could represent present value benefits between $117.5m and $181.3m over a 10-year period at a cost of $60m - $70m. Mandatory disclosure delivers considerable energy savings for those buildings covered by the scheme.

Such a policy could abate between 113,200 and 174,900 tonnes of CO_2 eq over a 10-year period at a net benefit of $597/tonne.

113,000 – 175,000
T CO_2 eq. abated.

$597.46
Net benefit per T CO_2 eq. abated

Recommendations

- Adopt a mandatory energy efficiency disclosure regime for large commercial buildings using the NABERSNZ framework – similar to Australia and consistent with advice from the Climate Change Commission.
- Begin applying the mandatory requirement to buildings over 2000m^2. Larger buildings are more energy intensive, are better able to achieve economies of scale, and their owners are generally better capitalised. This will facilitate implementation and results.
- Over time, the policy should be extended to buildings above 1000m^2. This will work to maximise energy savings. The policy should not be extended to buildings below 1000m^2. Poor economies of scale, and their generally lower energy intensity mean energy savings are likely to be minimal and net benefits negative.
- Over time, the policy should be extended to other building typologies, such as hotels, public hospitals and retail buildings.

Contents

Context

The New Zealand Green Building Council asked Sense Partners to explore policy options to improve energy efficiency of existing commercial buildings, consistent with the Climate Change Commission's recommendation to implemented measures to improve the energy performance and reporting of energy intensity of existing buildings by 31 December 2022. The policy framework should be a "progressive realisation and constructive accountability" to reduce emissions from buildings.

Decarbonisation will need more electricity supply

Moderating the global average temperature increases of climate change requires deep and broad decarbonisation of the global economy. Though small in a global context, as a high per-capita emitter New Zealand has a leadership role to play in decarbonisation.

One side of decarbonisation is the move toward sustainable and renewable sources of energy. To do this through the supply side alone is an enormous task, if we do not fast-track emergency efficiency in all parts of the economy.

Reducing emissions in transport and process heat will result in a surge in electricity consumption, as cars switch over from petroleum and as process heat is electrified. This may increase electricity demand by 68% by 2050[1]. With around 80%[2] of New Zealand's electricity generation coming from renewable sources, there is a need to decarbonise both the current supply and to meet future demand with significant expansion of renewable generation.

Figure 1: Total Electricity Demand – Expected Increase to 2050.

Source: Transpower, Sense Partners

It will be immensely costly and challenging to decarbonise electricity solely through supply side policies. There are several policy options to encourage energy efficiency, reducing the amount of additional new electricity required. A mix of supply and demand initiatives will make a greener economy that is also more cost effective.

Efficiency gains will reduce demand

International experience, in particular Australia, shows relatively easy energy savings in the existing building stock. Small nudges that fast track building upgrades can significantly reduce energy consumption. The Commercial Building Disclosure (CBD) Program is a regulatory

[1] Transpower. 2020. Whakamana I Te Mauri Hiko: Empowering our Energy Future

program that requires energy efficiency information to be provided in most cases when commercial office space of 1000 square metres or more is offered for sale or lease.

A production-oriented view of emissions, the typical approach, shows that emissions from the building stock are between 4.2% and 6.7%[2] of total GHGs (2019). However, taking a consumption-oriented view of emissions, which more accurately reflects the carbon intensity of our lifestyles, can yield an estimate closer to 20% of GHGs[3]. This is comparable to international figures, as it accounts for the distortion created by the high exports of the agriculture sector. Our existing buildings are clearly large emitters.

The Climate Change Commission's *Advice to the New Zealand Government on its first three emissions budgets and direction for its emissions reduction plan 2022 – 2025* recommended "developing a plan to transform buildings to be low emissions and climate resilient."[4] Recommendation 22 specifically noted [emphasis added]:

1. Government to have, by 31 December 2022, implemented measures to improve the energy performance of existing buildings, such as **mandating participation in energy performance programmes**.
2. Government to have, by 30 June 2022, scaled up energy efficiency assistance to low-income households.
3. Government to **report** annually, from 31 December 2022, on a suite of indicators, including residential and **commercial energy intensity**.

The Climate Change Commission is recommending **progressive realisation and constructive accountability** to reduce emissions from buildings. This is an important framework to consider our policy options.

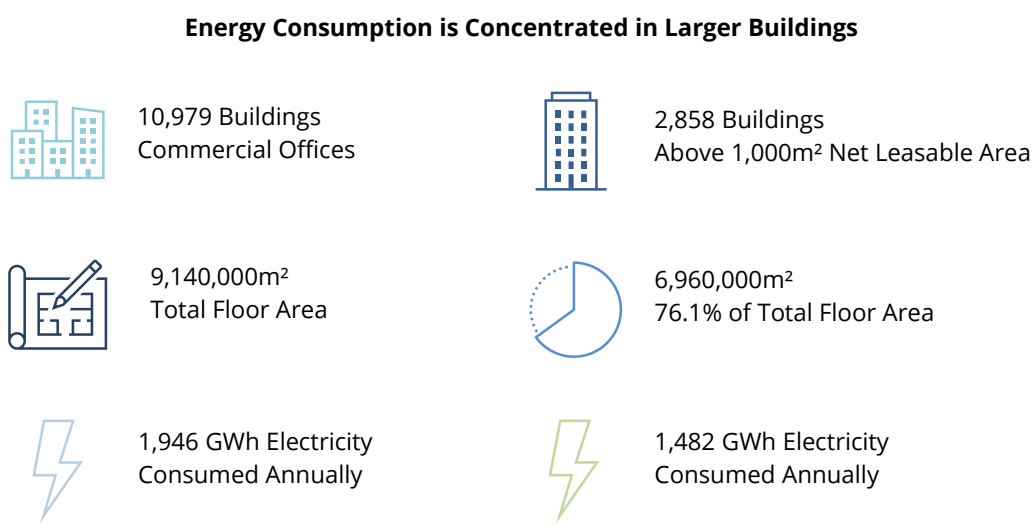
The residential sector, our homes, consume just under a third (32%[5]) of New Zealand's electricity, while the commercial office sector consumes just under a quarter (23.7%[1]). Though lower than residential, energy consumption within the commercial sector is relatively concentrated in larger, more energy intensive buildings. This concentration and economies of scale for relative will make a targeted response more achievable and will enable energy savings to be achieved in a shorter time span.

Commercial sector energy consumption has flattened in the last decade, mainly due to energy efficiency gains.[6] Despite this flatlining, more is required to offset increasing energy demand from other sectors. We believe there are market failures when it comes to energy efficiency improvements for existing buildings, which current policies do not remedy. Further policy action is needed.

---

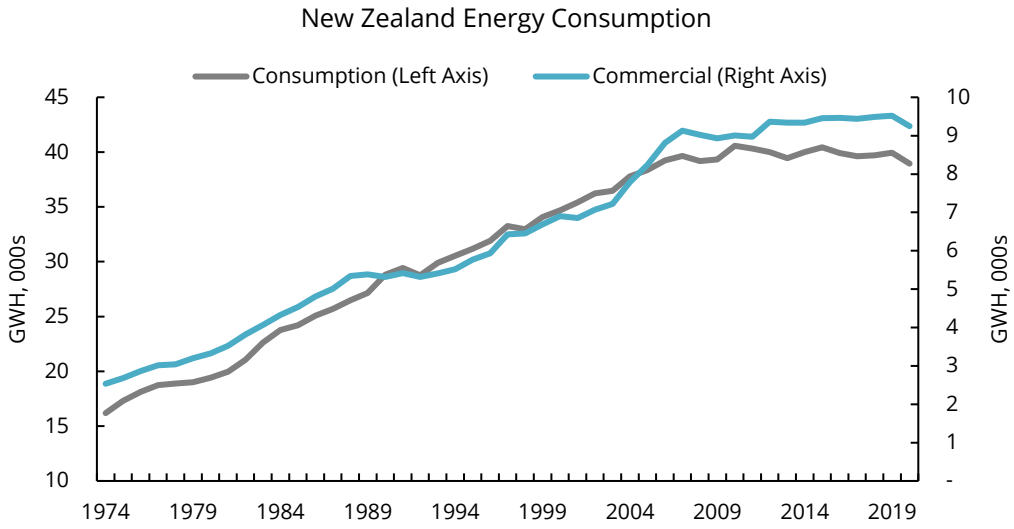
[2] Calculated using emissions data from MfE (see above) and electricity consumption data from MBIE (see 4 below).
[3] Thinkstep Australasia. 2018. The carbon footprint of New Zealand's built environment: hotspot or not?
[4] Climate Change Commission. 2021. Recommendations from Māia tonu nei: a low-emissions future for Aotearoa
[5] Ministry of Business, Innovation, and Employment. 2021. Quarterly Electricity Generation and Consumption Data Updates
[6] Calculated using data from Valocity and MBIE.

Figure 2: Energy Use Intensity (EUI) Concentration.



Source: Valocity, MBIE, Sense Partners

Figure 3: Energy use has stabilised in recent years due mainly to efficiency gains



Source: MBIE, Sense Partners

Figure 4: Energy Use Intensity (EUI) Reduction 2016 – 2021.

Source: Valocity, MBIE, Sense Partners

Some policy interventions are already in place, and more are being developed, to improve energy efficiency in the commercial building sector. This includes the Ministry of Business, Innovation, and Employment's (MBIE) contribution to the Emissions Reduction Plan, which places caps on Energy Use Intensity (EUI) in new commercial buildings. But we need to also improve the existing stock.

Other policies also help. The New Zealand Emissions Trading Scheme (NZ ETS), which includes electricity generation, aims to use market mechanisms (prices) to induce greater energy efficiency. A higher carbon price could send the price signal toward more energy efficiency.

There are multiple policy avenues and they all need to work in concert and in coordination.

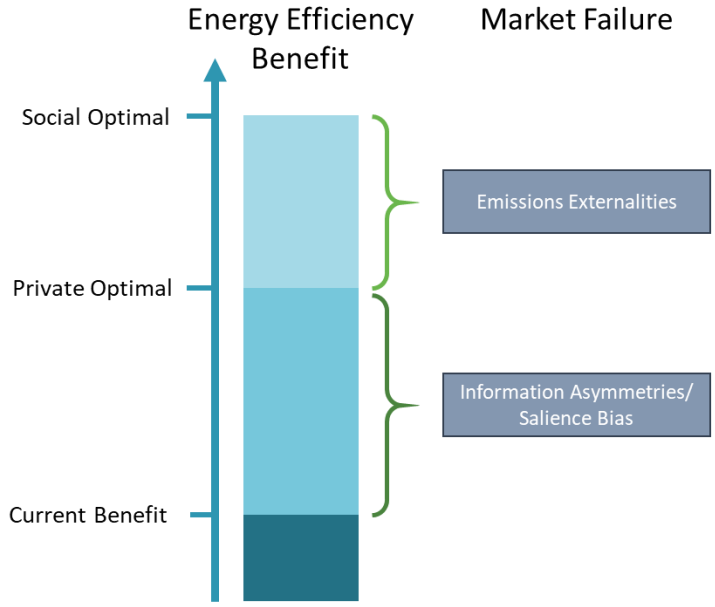
The problem

Two types of market failures

We observe two types of market failures when it comes to emissions from commercial buildings. The first is from mispricing of externalities (or the environmental and social cost) from emissions. The second is from information asymmetries and misalignment of incentives. Both of these market failures lead to lower energy efficiency than is socially optimal, or technically feasible.

When emissions aren't accurately priced it is worthwhile for private owners to emit more. The NZ ETS aims to remedy this market failure.

Figure 5: Stylised benefits of energy efficiency gains and related market failures



The literature[7] also identifies a second set of market failures, showing that the market is not well-functioning. These include:

- Misaligned Incentives: The costs of achieving energy efficiency lie with the property owner, yet the benefits of lower power bills typically lie with the tenant.
- Information Asymmetries: Prospective tenants typically do not have the same level of information on the energy efficiency of buildings as the building owner has. The building owner may also have less than perfect information.
- Salience Bias: The cost of rent, and the capital cost of efficiency improvements, are more certain and upfront. In contrast, the payoff of energy efficiency is uncertain and in the future. This difference in the salience of costs can impact decision making.

The first identified market failure, misaligned incentives, is a common feature of markets but is corrected through the price mechanism. In a well-functioning market, we would expect the price signal to align incentives, meaning a higher potential rent would incentivise building owners to invest in efficiency.

It is the presence of the second set of market failures which prevents the alignment of incentives through the price mechanism. A policy response which successfully mitigates the impact of information asymmetries and salience biases will likely lead, by extension, to a more accurate alignment of incentives.

Lease types matter

Lease types can affect the second set of market failures identified above. Leases for office space may be gross or net[8]. In the former, the tenant pays a fixed amount per period which includes both rent and expenses such as power. In the latter, the tenant will pay a fixed rent with variable costs added on top of that.

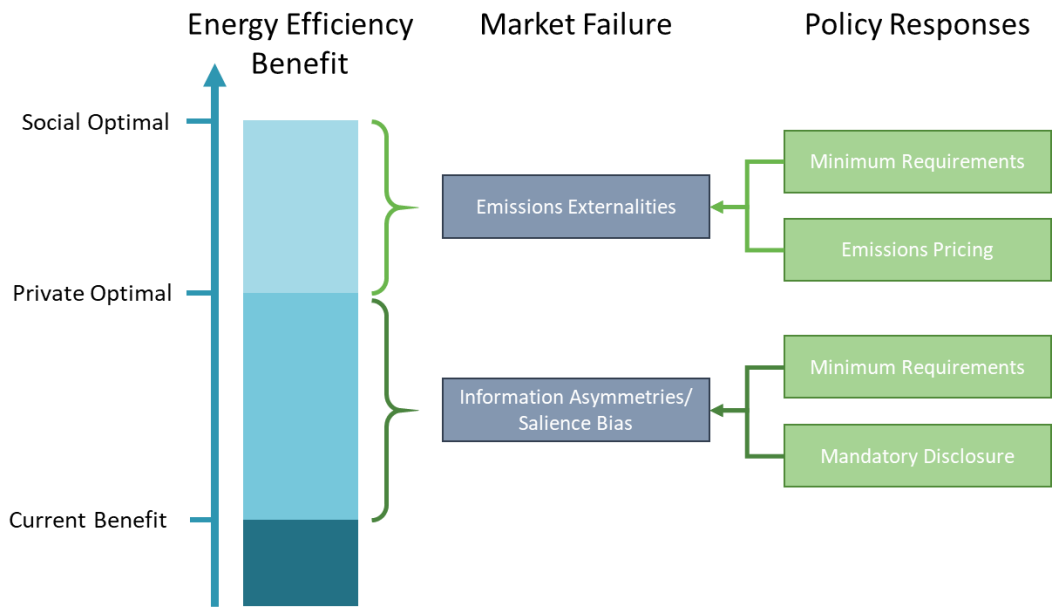
For a gross lease, the issue of incentive alignment, information asymmetries, and salience bias is largely corrected as the direct costs and benefits of energy efficiency lie completely with the building owner. It is only in the case of a net lease, where variable energy costs are passed on to the tenant, that the identified market failures are expected to occur. In New Zealand, net leases are more common and hence misalignment of incentives and information asymmetries are more prevalent.

[7] See, for example: Centre for International Economics. 2019. *Independent Review of the Commercial Building Disclosure Program*. pp.22 - 24
[8] Energy Action. 2018. Mandatory Disclosure of NABERSNZ Rating for Office Buildings

A range of solutions

Literature and experience show that socially optimal and technically feasible energy efficiency investments are not always put in place due to two broad sources of market failures. There are a range of policy options to remedy these problems. It may not always be optimal or feasible to implement potential (ultimate) solutions immediately, rather progressive realisation and constructive accountability is a more sustainable and less disruptive approach.

Figure 6: Potential policy responses to known market failures



Dealing with information asymmetries and salience bias

For information asymmetry, a common policy response is mandatory information disclosure. This can be seen in food labelling standards, whiteware energy efficiency standards[9], and more pertinent to this case, building energy efficiency standards (for example in Australia).

For Salience bias, the policy response is mandatory disclosure, but often extends to detailed design of communicating that information through the visual design of labels (star, etc)[10].

Information disclosure is at its core a low touch regulatory approach. It requires the information to be disclosed, and leaves it to market participants to make their decisions. The desired outcome is delivered through market forces. As part of their advice to Government,

[9] See, for example: Delmas, M.; Fischlein, M. & Asensio O. 2013. "Information strategies and energy conservation behaviour: A meta-analysis of experimental studies from 1975 to 2012." *Energy Policy*. 61. pp.729-739.
[10] London Economics. 2014. Study on the impact of the energy label – and potential changes to it – on consumer understanding and on purchase decisions

the Climate Change Commission has recommended[11] that a mandatory building labelling scheme be introduced to accelerate energy efficiency improvements in the existing commercial building stock. We agree. Information disclosure is a relatively low cost and low intervention policy.

A more interventionist approach is to mandate minimum standards of energy efficiency. This requires all building owners to meet the minimum requirements, but does not necessarily promote greater efficiency gains. This requires a greater regulatory intervention, monitoring and enforcement.

The New Zealand Building Code is a good example, which sets the regulatory minimum for building quality. While much higher standards are possible, the regulatory minimum becomes the *de facto* target (rather than the minimum) for home builders.

Minimum standards are good for setting a floor on energy efficiency, but other policies are needed to achieve higher efficiency gains.

Dealing with emissions externalities

For emissions, the simplest mechanism in theory is to price emissions and allow market forces to take care of the details. This is what the NZ ETS aims to achieve by pricing the externality.

The NZ ETS includes electricity generation and industrial heating[12]. This means that a policy framework, in the form of emissions pricing, is already in place. Assuming that the emissions are properly priced, the externality has already been priced into the cost of energy and thus does not require a further policy response.

If the true cost of emissions has not been fully priced in, then the simplest policy option is to increase the price of emissions within the existing policy framework.

We could also introduce minimum required standards. This would create additional policy structures, including additional enforcement and monitoring costs. Minimum standards can impose a floor, but does not necessarily promote greater efficiency gains. The additional cost and complexity, and foregone efficiency gains are unlikely to yield benefits beyond that of a properly priced ETS.

The government operates across a policy spectrum

When we look at policy responses to market failures, we consider it in a spectrum across intensity of intervention (which reflects the level of effort required by policy makers to achieve desired outcomes) and associated costs and benefits.

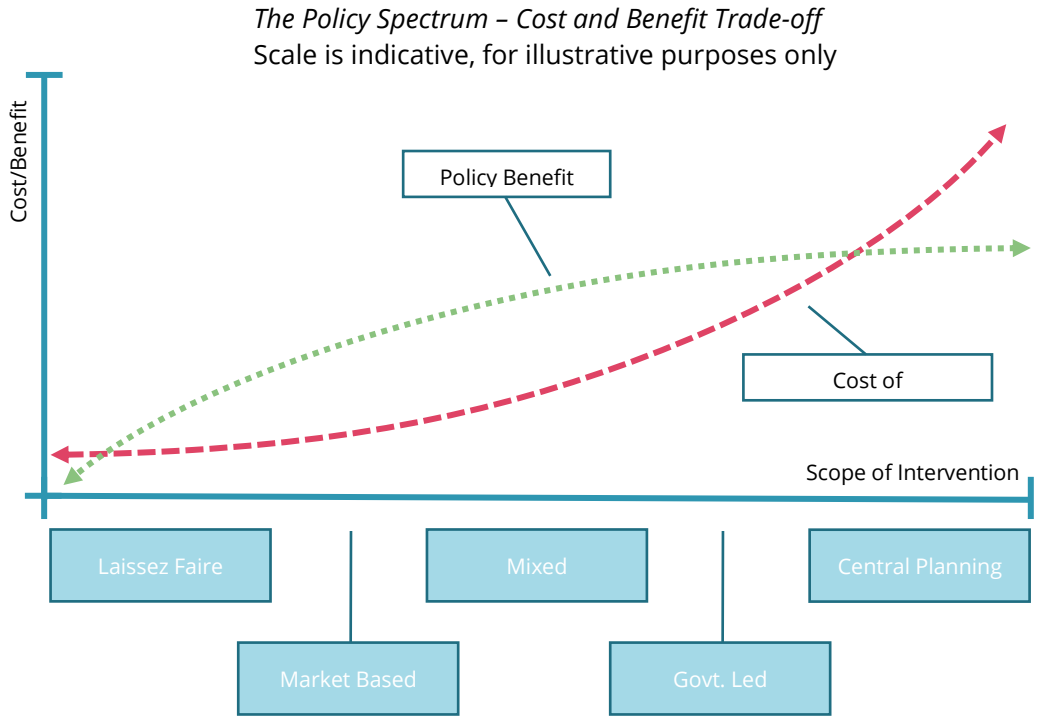
Some low touch interventions aim to modify existing market forces to achieve objectives, relying on market mechanisms to do the heavy lifting. Mandatory information disclosure could be considered a light touch approach – where the government requires building owners to

[11] He Pou a Rangi Climate Change Commissions. 2021. Ināia tonu nei: a low emissions future for Aotearoa
[12] Ministry for the Environment. 2021. Coverage of the New Zealand Emissions Trading Scheme

disclose energy efficiency information in a consistent manner at the time of sale or lease (as required in Australia for commercial buildings above 1,000m^2).

Toward the other end of the spectrum are policy options which involve a greater degree of government intervention. These interventions may still seek to use market forces, though they may also seek alternatives to market forces to achieve the desired outcome. Minimum energy efficiency standards could fall in this category – where all buildings are required to lift energy efficiency to a particular level, which would need to be monitored and enforced.

Figure 7: Policy interventions can go from light touch to heavy handed



Minimum standards could be used in response to both the information asymmetries and emissions externalities market. However, there are some known risks. Implementation costs may be higher, as a policy deadline may lead to a bottleneck of activity before the cut-off date, driving up costs. It could lead to premature retirement of older buildings prior to end of life, reducing supply of commercial space and potentially driving up rents. Those meeting minimum standards may choose not to implement greater efficiency standards, since they aren't 'required'.

Mandatory disclosure would harness market forces to achieve increased energy efficiency. The cost of implementation is likely to be much lower, as a mandatory disclosure does not impose upgrade costs, but may create incentives for building owners to invest in energy efficiency upgrades to attract tenants and premium rents over time.[13] This is a much more efficient

[13] Centre for International Economics. 2019. Independent Review of the Commercial Building Disclosure Program.

approach from an asset management perspective, though would mean energy efficiencies are potentially realised over a longer period.

NABERSNZ CBA and refresh

Energy Action[14] conducted a Cost Benefit Analysis of building energy efficiency options on behalf of EECA. A range of policy responses were assessed, including the mandatory disclosure, and minimum standards for buildings housing public sector agencies. The policies tested for various building sizes, with options for all buildings over 2000m^2 and 1000m^2 in net rentable area.

The findings of this CBA, using the 1000m^2 threshold, are summarised in reduced format in Table 1 below. Mandatory disclosure delivers substantial energy savings and accompanying financial benefits. This does not include any estimate of potential property value uplift, which the literature indicates are likely[15]. The costs of $77.7m are small in the context of the overall value of the property portfolio, an estimated $31.5b for all commercial offices[16]. Given that these costs represent investments in each asset which will be reflected in its overall value, rather than a sunk cost, it is reasonable to conclude that they are manageable.

Table 1: Reported Costs, benefits, and Energy Savings. Dollar values are discounted to 2018.

Option	Cost ($M)	Benefit ($M)	Energy Savings (GWh)
Mandatory Disclosure	77.7	124.9	822
Minimum standard public commercial buildings	28.2	60.1	414
Both	82.5	141.4	949

We updated the 2018 CBA to 2021, applying the growth scenario seen in Australia[17] to data obtained from MBIE, MfE, and Valocity. We established two scenarios of building base energy use intensity (EUI). The first is the EUI measured in Australia. Whether this is an accurate reflection of New Zealand buildings is ambiguous, as while buildings in Australia will likely require relatively more cooling, buildings in New Zealand will require relatively more heating. The second scenario uses the EUI estimate used in the 2018 NABERS CBA.

[14] Energy Action. 2018. Mandatory Disclosure of NABERSNZ Rating for Office Buildings.
[15] See, for example: Leskinen, N.; Vimpari, J. & Junnila S. 2020. "A Review of the Impact of Green Building Certification on the Cash Flows and Values of Commercial Properties." *Sustainability*. 12(7)
And: Das, P. & Wiley, J. 2013. "Determinants of premia for energy efficient design in the office market." *Journal of Property Research*. 31(1), pp. 64 - 86
[16] Data supplied by Valocity
[17] Centre for International Economics. 2019. Independent Review of the Commercial Building Disclosure Program.

Table 2: Refreshed Benefit and Energy Savings Values. Dollar Values are discounted to 2021.

EUI Scenario	Benefit ($M)	Energy Savings (GWh)	CO_2 Eq. Abated (t)
153kWh/m^2	181.3	1,819	174,895
99kWh/m^2	117.5	1,179	113,331

This updated value includes more contemporary property data and assumes implementation in 2023. Other assumptions, such as prevailing energy tariffs, changes in baseline energy usage, property stock growth, and discount rates are the same. The annual energy savings are equivalent to the energy used by 10,000 - 20,000 homes per year.

The NABERS CBA uses data drawn from first principles estimates of EUI[18] rather than existing databases, and so the values are not directly comparable. They do, however, provide an indication of the likely benefit of a more contemporary implementation of the policy. We have assumed no change in cost.

Table 3: Abatement Costs and Benefits

T CO_2 Eq./GWH	$ Cost/t CO_2 Eq.	$ Benefit/t CO_2 Eq.	$ Net Benefit/ t CO_2 Eq.
96.11	983.53	1580.99	597.46

The refreshed values yield a cost per tonne of carbon abated of $983.53. Given the assumed retail energy tariff, the benefit is $1,580.99 resulting in a net benefit of $597.46 per tonne of CO_2 Eq. This positive net benefit is intuitive, as the policy seeks to address an internality. The benefit will be realised directly. The current emissions rate of electricity in New Zealand is assumed to remain unchanged.

In a counterfactual scenario, with no increase in energy efficiency, it is possible that the higher energy demand would need to be met by a carbon intensive form of generation, such as coal or natural gas. In such a counterfactual, the amount of carbon emitted would be higher than assumed here, and higher than in the energy efficient scenario. This could mean this estimate of abated carbon is low, but without understanding how future energy demands will be met in either scenario we assume a conservative no-change.

Both the original CBA and our refresh benefit estimates are calculated assuming a steady energy retail tariff of $0.17/kWh. Given the expected surge in electricity demand, prices are likely to be higher. As a result, the direct financial benefits are likely to be higher than estimated.

When considering minimum standards for public sector tenancies, we can expect to see network effects. As public sector minimum can become a *de facto* standard for other

[18] BRANZ. 2014. Building Energy End-use Study, Part 1: Final Report.

commercial tenants. These should lead to other buildings improving their energy efficiency in anticipation of being able to compete for public sector tenants. This is justified, as restricting public sector agencies to the smaller portion of buildings which meet the rating may, in effect, constitute a restriction of supply. Those building owners may subsequently have the ability to demand a higher price, an opportunity other building owners are likely to be tempted by.

Mandatory disclosure and minimum standards are expected to have a broadly similar impact on energy efficiency over time. The difference is that a minimum standard would require that those benefits occur sooner than they would under a mandatory disclosure policy. The assessment period of this CBA is 10 years, which largely explains the higher energy savings of a combination of these policies compared to mandatory disclosure alone. The reason the benefits are expected to be largely the same comes down to the market dynamics at play.

As we show below, all scenarios impose costs but all return net benefits.

Figure 8: Benefit-Cost Scatter Plot. CBA Reported Values.

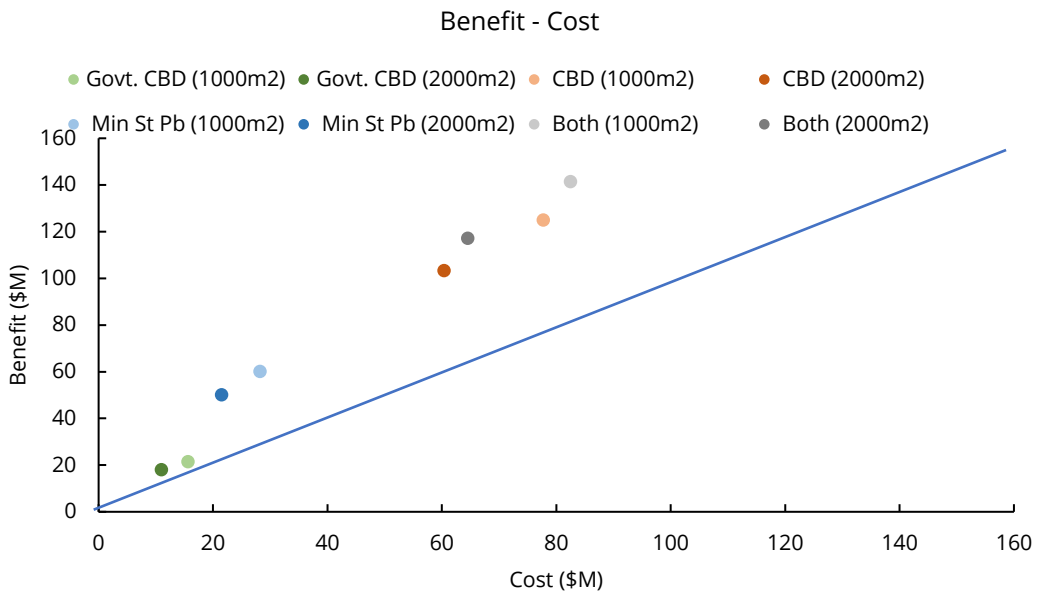


Table 4: Reported Net Benefits, BCRs, and Energy Savings. Dollar values are discounted to 2018.

Option	Net Benefits ($M)	BCR	Energy Savings ($M/GWh)
Mandatory Disc.	47.2	1.61	0.095
Min. Std. - Publ.	31.9	2.13	0.068
Both	58.9	1.71	0.087

Voluntary versus mandatory disclosure

The CBA shows that benefits outweigh costs. Also that light touch interventions impose less immediate costs, although lead to similar energy savings over time.

New Zealand currently has a voluntary disclosure regime for NABERSNZ. Some buildings get it, but it is not universal and does not deliver the benefit of mandatory disclosure, which is easy comparability of all rated buildings.

Voluntary schemes help, but do not solve information asymmetry

In a voluntary scheme, obtaining a certification generally forms part of a wider strategy of asset renewal targeting the prime property market. That is, it can be a signalling tool for quality. Studies[19] indicate that participation is dominated by the prime property market, particularly larger commercial buildings. The certification itself was primarily a market signalling device[20], with the intention being to signal differentiation from other alternatives.

Many studies, most using hedonic regression models[21], found positive correlations between certification and rent premium, occupancy rates, and property value as well as, crucially, substantially lower energy consumption[22] and thus costs. Because the certification is most often associated with a broader premium strategy, certification is closely linked to other drivers of property value[23]. For example, aesthetic building design, location, proximity to amenities, and so forth. Some studies have noted this when reporting no evidence of value uplift[24].

Despite the clear financial incentive in terms of energy savings, the market dynamics are such that the main purpose of voluntarily obtaining a certification remains to signal quality.

Evidence from the UK[25] indicates that in a highly competitive market, voluntary schemes can become market mandatory. Those buildings without these signals of quality are reported through interviews to be much harder to sell or lease, and it is commonly perceived that these voluntary certifications are an essential component of a property strategy.

---

[19] Asensio, O. & Delmas, M. 2017. "The Effectiveness of US Energy Efficiency Building Labels." *Nature Energy.* 2.
[20] German Sustainable Building Council. 2019. *Added value of certified buildings.*
[21] See again, for best example: Leskinen, N.; Vimpari, J. & Junnila S. 2020. "A Review of the Impact of Green Building Certification on the Cash Flows and Values of Commercial Properties." *Sustainability.* 12(7).
Also: Fuerst, F. & McAllister, P. 2009. "An Investigation of the Effect of Eco-Labeling [sic] on Office Occupancy Rates." *Journal of Sustainable Real Estate*. 1. pp. 49-64
For an example on residential buildings: Pommeranz, C. & Steininger, B. 2021. "What Drives the Premium for Energy-Efficient Apartments – Green Awareness of Purchasing Power?" *Journal of Real Estate Finance and Economics*. 62. pp. 220-241.
[22] See again: Asensio and Delmas. 2010. above.
Also: Hicks, T. & Neida, B. 2003. *U.S. National Energy Performance Rating System and ENERGY STAR Building Certification Program*.
[23] See, for example: Cass, N. 2020. "Energy and Sustainability Labels in the Commercial Office Market in the UK" in *Labelling the Economy,* edited by Laurent, B. & Mallard, A. Palgrave Macmillan, Singapore.
And: Brocklehurst, F. 2017. "What will you pay for an "A"? – a review of the impact of building energy efficiency labelling on building value." *ECEEE Summer Study Proceedings.* pp.1259-1269
[24] See commentary in Asensio & Delmas 2017. above.
[25] See again: Cass, N. 2020. above.

Mandatory schemes are a policy tool

In the case of a mandatory scheme, certification becomes a necessity and level of energy efficiency becomes the point of differentiation, rather than the certification itself[26].

In terms of the physical implementation, voluntary certification tends to coincide with end-of-life asset renewal or new builds. That is voluntary schemes are an add-on to planned upgrades. With a mandatory scheme, low-cost actions may be taken swiftly, but capital-intensive renovations are typically left to end of life renewal.[27]. This suggests a mandatory schemes fast-tracks low cost efficiency gains, but larger upgrades and benefits are spread over time (making the upgrade cycle manageable and cost effective).

Ratings need to balance incentives for immediate and long term efficiency gains

Most schemes typically leave it up to individual developers and building owners to decide what energy efficiency investments they will make. Building managers will readily take low-cost actions first, but leave larger, capital intensive changes until end-of-life renewal[28].

The certification regime needs to carefully balance the relationship between actions and the ratings they can earn. If low cost, low impact actions are given too high weighting, then building managers will game the system to achieve a higher rating, at minimal cost, and with little realised energy saving benefit.

The initial rating schemes in the UK set a reasonably low standard, but improvements over time have led to those certifications setting quite a high bar.[29]

Ratings on one building type can go on to cover other buildings. NABERS in Australia now covers retail, data centres, hospitals, warehouses, aged care, hotels and retirement living.

Market – Policy Interaction

In New Zealand, voluntary certification is not yet widespread. Unlike the UK, the voluntary scheme has not become a de facto minimum standard for the market. It may be that there is insufficient brand awareness of what a certification constitutes, and subsequently prospective tenants are not fully aware of the information asymmetry they face. A mandatory scheme would reduce information asymmetry in the commercial property market.

The Ministry of Business, Innovation, and Employment (MBIE) is proposing a policy designed to place caps on energy use intensity (EUI) for all new builds. In other words, this would impose a minimum energy efficiency standard for new commercial buildings[30]. This will be implemented as part of the Governments Emissions Reduction Plan. Should this go ahead, it will mean that all new builds will perform to a higher energy efficiency standard.

---

[26] See again Cass, N. 2020. above.
[27] Centre for International Economics. 2019. Independent Review of the Commercial Building Disclosure Program. pp. 22-24
[28] See again, Centre for International Economics. 2019. above.
[29] See again Cass, N. 2020. Above.
[30] Ministry of Business, Innovation, and Employment. 2020. *Transforming Operational Efficiency*

A minimum standard for new builds will have a network effect to existing buildings. This will likely create additional competitive pressure among owners of existing buildings to improve their own energy efficiency. If combined with a mandatory disclosure regime, it would provide transparent and consistent information for all buyers and lessees to create further incentives for existing buildings to invest in energy efficiency upgrades.

Conclusion

There are significant potential energy savings to be made in the built environment, and particularly commercial offices using mandatory disclosure regime such as NABERSNZ.

1179 – 1822 GWh
Potential Energy Savings to 2030

113,000 – 175,000
T CO_2 eq. Abated.

$597.46
Net Benefit per T CO_2 eq. Abated

There are a set of market failures which are preventing an efficient market outcome. Existing policies, such as the NZ ETS, do not correct for these failures. Minimum standards being designed and implemented by MBIE will apply only to new builds.

The literature provides ample evidence that disclosure correct the information asymmetries which are the primary market failure. Mandatory disclosure brings forward benefits while still leaving it to owner discretion on when and how to incur upgrade costs. This can help to reduce the cost of implementation and avoid deadline bottlenecks in upgrading resources, that can lead to capacity constraints, cost inflation, and reduction in work quality. Mandatory disclosure also creates a framework for data gathering and other regulatory interventions.

Minimum standards for existing buildings may be needed in due course, but it is likely better to focus on implementing mandatory disclosure as a first step before committing to minimum standards. Minimum standards for public sector tenancies are in use elsewhere and may be an appropriate next step once mandatory disclosure has been implemented.

Recommendation

- Adopt a mandatory energy efficiency disclosure regime using the NABERSNZ framework. This corresponds to Option C of the NABERS Cost Benefit Analysis.
- Begin applying the mandatory requirement to buildings over 2000m^2. Larger buildings are more energy intensive, are better able to achieve economies of scale, and their owners are generally better capitalised. This will facilitate implementation and results.
    - Over time, the policy should be extended to buildings above 1000m^2. This will work to maximise energy savings.

- The policy should not be extended to buildings below 1000m^2. Poor economies of scale, and their generally lower energy intensity mean energy savings are likely to be minimal and net benefits negative.

SENSE PARTNERS

DATA LOGIC ACTION