mirvac

PLANET POSITIVE

FREQUENTLY ASKED QUESTIONS

June 2019

This Changes Everything

by mirvac

Scope

1. What are the boundaries of Mirvac's net positive roadmap?

Currently, our net positive (carbon) commitment applies to operational carbon emissions of buildings over which we have direct control. We're including all scope 1 and 2 greenhouse gas (GHG) emissions from our investment portfolio and state offices, wherever we have operational control[1] and a direct ability to impact energy and refrigerant use and associated emissions. This means that we are reporting emissions for the majority of our office and retail assets.

This approach aligns with our current reporting obligations under the Australian Government's National Greenhouse and Energy Reporting (NGER) legislation.

SCOPE 1: DIRECT GHG EMISSIONS

These are emissions associated with our direct consumption of:

- fossil fuels, specifically natural gas (which we mainly use for heating and domestic hot water) and diesel (used for emergency back- up power)
- refrigerants used in commercial air conditioning.

SCOPE 2: INDIRECT GHG EMISSIONS

These are created by other facilities like power stations during the generation of electricity which is then purchased and used by sites under Mirvac's operational control.

In our investment portfolio, this electricity is generally used for typical base building items such as heating, ventilation and air conditioning (HVAC), common area lighting, and lifts.

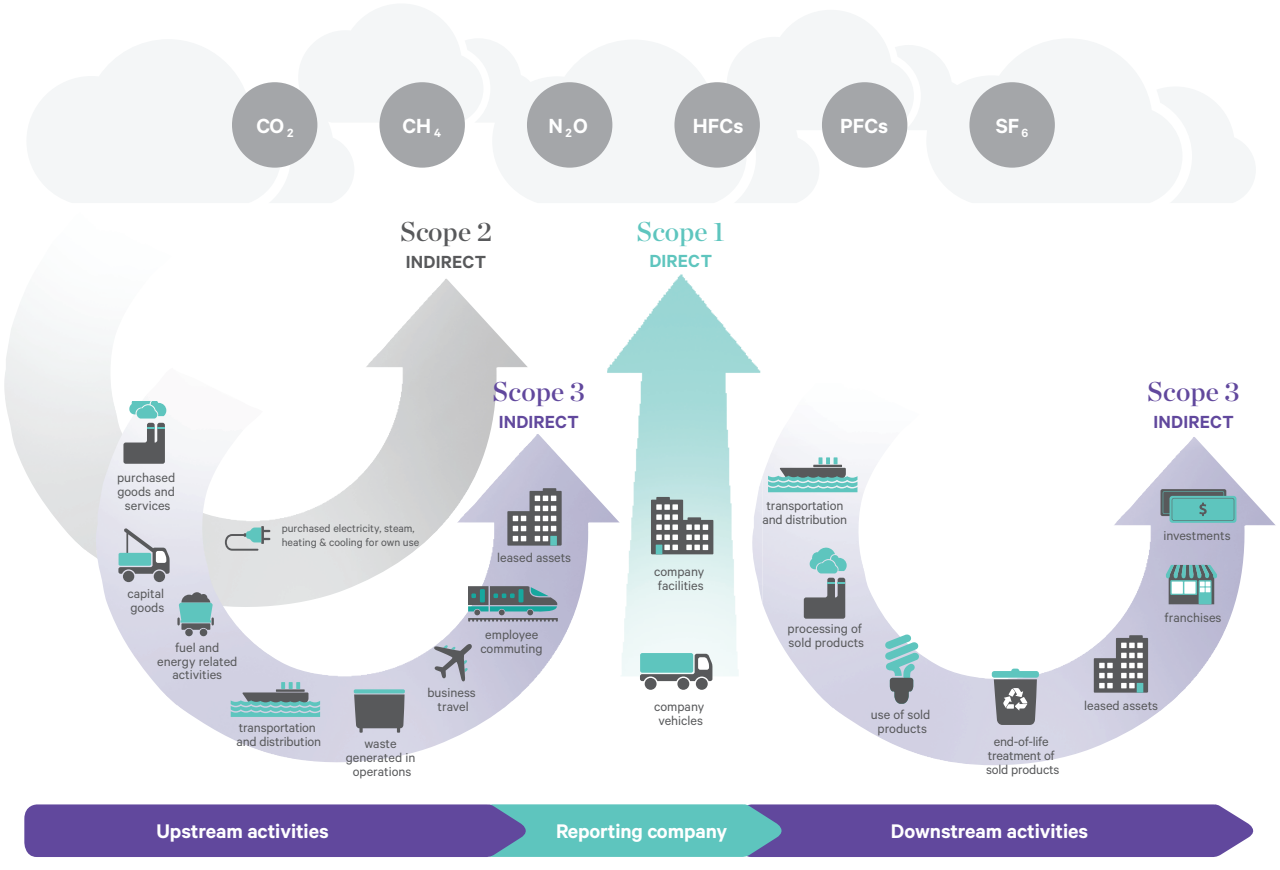
There are some assets over which Mirvac doesn't have operational control – specifically, our residential product that we sell, and the majority of our industrial portfolio (due to their lease structures). Since we have limited scope to control emissions from these assets, we have excluded them from our net positive carbon commitment. In addition, we have also excluded a small number of office assets because of the ownership arrangements in place.

Around three per cent of the scope 1 and scope 2 emissions we report for NGER come from Mirvac's vehicle fleet and construction and development activities[2]. While they are excluded from our Planet Positive plan, we continue work to reduce these emissions (see Q2).

Focusing on emissions from buildings and excluding vehicle and construction emissions and operational control helps align our definition with the Global Net Zero Carbon Buildings Commitment[3], although we have included emissions associated with refrigerant use to provide true operational carbon emissions rather than just those associated with energy.

Scope 3 emissions are the indirect emissions that occur in our value chain. The graphic below outlines the categories of scope 3 emissions as defined by the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

Overview of GHG Protocol scopes and emissions across the value chain



1. Operational control is defined as "the ability to introduce and implement operating policies, health and safety policies and/or environmental policies" as per the Australian Government's National Greenhouse and Energy Reporting (NGER) legislation and the United Nations Principles for Responsible Investment (UNPRI).
2. Based on Mirvac's FY18 annual report and NGER data.
3. World Green Building Council, The Net Zero Carbon Buildings Commitment, www.worldgbc.org/thecommitment, accessed 15th May 2019.

While we're not currently counting scope 3 emissions in our Planet Positive plan, we haven't ruled out doing so in the future. Before we make a decision about this, however, we will assess and understand where in the supply and value chain our scope 3 emissions lie, beyond what we currently report [1], which includes business travel, waste from operations, and energy distribution. This will help us work out where we could have most impact, and therefore where to focus our efforts.

In the meantime, we'll continue to work with our supply chain partners to lower emissions throughout our value chain by providing green leases and sustainability tenant fit-out guides and opting for green building products, among other choices. This falls under our influence strategy, which we have explained in more detail in Q19.

2. Is Mirvac doing anything else to tackle climate change?

Yes, we are. In addition to our Planet Positive plan, we are undertaking other climate-related activities like reviewing internal climate risk governance, integrating climate resilience into our in-house minimum design guidelines, and maintaining employee engagement in climate-related subjects.

We're reporting in alignment with the Task Force for Climate-related Financial Disclosures (TCFD) recommendations as part of a global effort to improve climate change transparency, decision-making, and capital allocation. Within our 'business as usual' (BAU), we're also beginning to address and integrate physical risks, and also transition risks in response to our FY18 TCFD climate risk and opportunity review.

In addition, we are reducing emissions outside the scope of our Planet Positive plan, like those associated with our small vehicle fleet and construction activity. The actions we'll take regarding these emissions are outlined below.

FOCUS AREAS	ACTIONS	TARGET & TIMELINE
Scope 3 emissions	Assess scope 3 emissions as per the GHG Protocol	FY20
	Review and update fit-out guide and tenancy tips to reduce scope 3 emissions	FY21
Operational	Shift Mirvac fleet to electric vehicles First step: establish viability	FY21
Construction	Investigate biofuels to replace fossil fuels	TBD
	Early electrification of sites using 100% renewable energy supply	TBD
	On-site solar (site offices)	TBD

We'll also continue to improve the performance of the parts of our investment portfolio where we have financial control but not operational control.

3. Why have you removed the requirement to exclude newly acquired or developed assets?

Previously, we didn't include assets in our net positive calculations if we'd owned them for less than two years, or if we planned to redevelop them within five years.

Given that our net positive target is an absolute target, we have removed these criteria. We are responsible for emissions from these assets regardless of how long we've owned them, or what our future plans may be.

Keeping in mind our plan to move to 100 per cent renewable energy for our electricity needs before 2030, we expect that any emissions from newly acquired or developed assets will be minimal, and we plan to offset them until we find a cost-effective way to replace fossil fuels and refrigerants.

4. What about Build to Rent (BTR)?

Build to Rent (BTR) is a new asset class in Australia. Unlike our current residential homes, which we build to sell, BTR enables us to retain ownership and running of the residential apartment buildings we create. As with our commercial assets, we will be able to influence the scope 1 and scope 2 emissions associated with the base building of BTR assets, so they will be included in our net positive ambition. However, the emissions created by tenants, and the energy they use for things like lighting are scope 3 and will be outside our direct control.

1. Mirvac currently reports scope 3 emissions from business travel, waste from operations and energy distribution.

Strategy

5. Are you committing to carbon neutral as part of Mirvac's net positive roadmap?

No, we're not. While we recognise that achieving carbon neutral certification can be an appropriate target for some companies, it isn't a target we're pursuing. Rather, we are focusing on our net positive commitment, and its associated business implications and opportunities.

6. Is your net positive goal a Science Based Target?

No, our net positive target hasn't been developed in accordance with the Science Based Target (SBT) initiative. The objective of the SBT initiative is to encourage companies and industry sectors to 'do their share' of emission reduction to avoid more than 2 degrees Celsius of warming. In the building sector, the requirement is ~75 per cent reduction by 2050.

We believe our net positive target is more ambitious than this, both in terms of the percentage reduction in scope 1 and 2 emissions we're targeting, and the date by which we aim to achieve this (2030 as opposed to 2050).

7. How does Mirvac's net positive ambition compare to the plans of your peers?

The sustainability credentials of Australia's top tier property companies are globally recognised. It's important to note that the asset mix in the portfolios of many of our peers is quite different to ours. The age, roof space, and in-house design/construction capabilities are different from ours, and therefore the opportunities available to each of us are also different. It makes most sense for us to use our in-house design and sustainability services teams to continue to maximise energy efficiency, and transition to 100 per cent electric buildings using renewable energy. It's our current view that significant additional upfront capital outlay is not required to achieve this, and so we feel we are balancing environmental and commercial sustainability imperatives effectively. We will, however, continue to actively monitor this as the context and pricing evolves.

When we launched our commitment to be net positive carbon back in 2014, it was ambitious, and it still is today. So far, none of our peers have made a comparable net positive commitment. However, in the past few years, several have committed to net zero, either at a fund or portfolio level.

Beyond our industry, several companies have also committed to net positive, most notably those who form the Net Positive Project [1]. This is a coalition of cross-sector partners who are working to create a world where companies create net positive impacts by contributing more to society, the environment, and the global economy than they take.

8. What role will solar and other renewable energy forms have in Mirvac's Planet Positive plan?

Since the launch of This Changes Everything, and our strategy refresh in 2018, there have been significant changes in the economics of onsite 'behind the meter' and grid-supplied renewable energy systems, both of which have a vital contribution to make in decarbonising the grid. We continue to assess our onsite solar PV options, and we expect to install more of these in future.

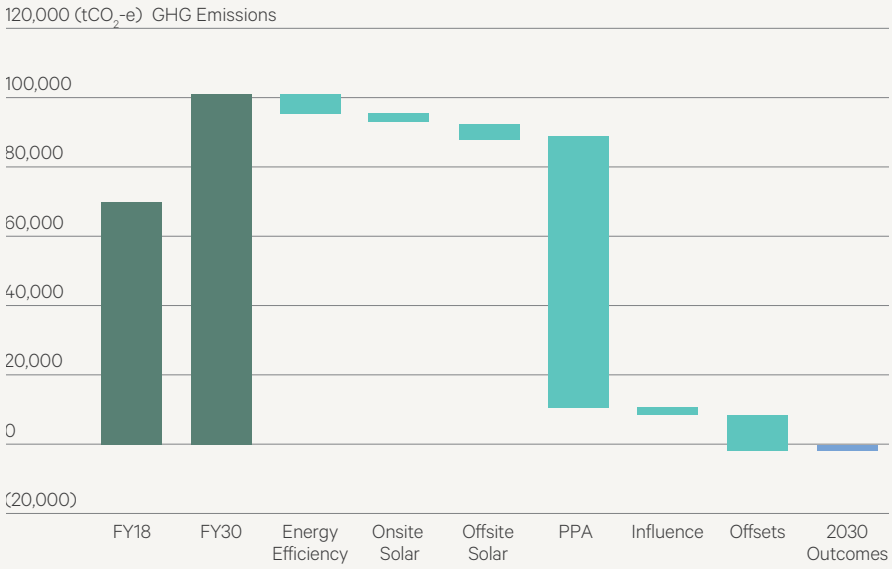
In conjunction with this work, we are pleased to see the rapid evolution of grid-supplied, fully-firmed, renewable energy supply agreements with low risk and highly competitive pricing. These agreements include power purchase agreements or PPAs. It's our view that these present compelling new options for renewable energy supply and could set an internal energy cost benchmark for systems installed on Mirvac assets.

We see three clear advantages of renewable energy agreements. Firstly, they may negate the need for significant capital outlay, which is around $1.5 to $2 million for a 1 MW PV system. Secondly, they reduce complexity and risk for property owners. Finally, they may also provide a better societal outcome because existing grid infrastructure is used and shared for the benefit of all grid users.

9. Mirvac plans to become net positive – but by how much?

The level of net positive, or the amount of emissions that we eliminate beyond what we emit, has been challenging to determine. Initially, we aim to eliminate an additional 1,000 tonne CO_2-e per annum in 2030 and beyond. However, we will continually review and adjust this target as we learn from our net positive initiatives as new innovations (such as offset mechanisms) become available, and as broader circumstances such as regulations and societal expectations continue to change.

Mirvac's pathway to net positive



10. What role will Mirvac Energy play?

Through Mirvac Energy, we have learned an enormous amount about the complexities of installing and operating renewable energy projects. Mirvac Energy has also been instrumental in the installation of our first megawatt of onsite solar. We are currently reviewing the opportunities that exist for Mirvac Energy in its next phase, alongside grid-supplied renewable energy.

1. Net Positive Project, www.netpositiveproject.org .Accessed 15th May 2019.

11. What is the composition of renewables you are targeting and how do you balance risk and market jurisdictions?

Mirvac is targeting 100 per cent renewable energy for our investment portfolio and state offices to eliminate scope 2 emissions associated with their operations.

New developments will be 100 per cent electric as soon as possible to help eliminate the vast majority of scope 1 emissions being added to our portfolio and reduce the legacy emissions. Risk will be balanced through a firmed renewable energy supply agreement mechanism in which we manage the load risk and the retailer manages the energy generation and supply risk.

We are agnostic about the type of renewable energy we install on our sites. Our choices will be informed by several factors including economics (which influence grid-supplied renewable energy), the penetration of renewable energy on the grid, and the environments in which we're working. For example, wind currently supplies a large amount of Australia's renewable energy generation but it's less suited to the urban environment. And while solar provides an effective onsite renewable option, it requires external areas with good solar access and orientation, ideally situated close to electrical infrastructure. So, it's likely a combination of both wind and solar will suit us best.

12. How often will you be updating this document?

We'll review our net positive plan annually to make sure that our decisions continue to meet the needs of our business and that we're factoring in the best current information available. Regular reviews and updates will also allow us to take advantage of new innovations and technology cost reductions (similar to what we have seen with solar energy).

Our reviews will also include the targets and metrics we share with the market to enable the tracking of our progress.

Commercial

13. What are the impacts to our operational business of moving to renewable PPAs?

When Mirvac talks about power purchase agreements (PPAs), we are referring to fully firmed renewable energy supply agreements[1]. By moving to PPAs, Mirvac can procure the remainder of our electricity requirements from renewable energy, effectively eliminating the scope 2 emissions that comprise the vast majority of the emissions under our operational control. These agreements are expected to require a level of guaranteed load from the purchaser (for instance, a take-or-pay component which provides a minimum purchase amount for the generator).

Moving to these renewable energy agreements will require longer contract terms, moving from one to three years, to five to ten years. Long term renewable energy contracts do carry term risk but also reduce the energy price volatility, which has impacted energy costs and looks set to continue. Our modelling suggests that these agreements may be more cost effective than non-renewable energy purchases over the same period.

14. What are the impacts to our development activities of moving to fossil fuel free assets?

For us to operate with 100 per cent renewable energy, our newly developed assets will need to be 100 per cent electric and thereby eliminate scope 1 and scope 2 emissions. Emergency back-up power will be provided by diesel engines for the immediate future, but the emissions from these generators are minuscule in comparison to emissions from gas and electricity from non-renewable sources. Alternative forms of emergency generation will evolve, but diesel generators are expected to remain for some time.

We will continue to use tri-generation and co-generation systems as a transition strategy[2], and these will be slowly phased out as they approach end of life, end of contract, or become environmentally or economically unviable.

Electrical demand may increase with electric domestic hot water and electric space heating, but as space heating and cooling are required at different times of the year, this additional demand should be small. Gas is an effective and reasonably cost-efficient fuel for space heating. However, gas markets have been highly volatile and considerable price increases have occurred since the export of LNG commenced from the Australian east coast, making gas a less attractive option. In comparison, all-electric buildings with firmed, long-term renewable energy supply agreements provide price certainty and consistency. Having a single supply agreement and no need for gas pipework reticulation also adds to the design efficiency of all-electric buildings.

Already, several Mirvac assets are heated using electricity, and only use gas for domestic hot water heating. Two of these properties have achieved 6 Star NABERS Energy ratings, demonstrating their energy performance is not compromised by electric heating.

1. Some of the earlier PPAs were not full firmed requiring multiple contracts (and the procurement of black/conventional power) to remove risk.
2. Co-generation is the generation of electricity and useful heat jointly. In commercial buildings, gas fired engines are typically used to generate electricity and waste heat, which is used to provide heating and/or hot water. If the waste heat is also used to provide cooling (via an absorption chiller), this is referred to as tri-generation. For ease of use in this document, when we refer to co-generation, we are referring to both co-generation and tri-generation.

Technical

15. What's the difference between emission intensity and absolute reduction in emissions?

Essentially, there are two different ways of calculating emission reduction. When we talk about 'emission intensity' we mean the mass of emissions per m^2 floor area. Reducing intensity means that less pollution is being created per m^2. In contrast, 'absolute reduction' means that total emissions are being reduced, making it a more complete measure.

When Mirvac launched *This Changes Everything* in 2014, we used an emission intensity target (tonnes CO_2-e/m^2) to drive performance improvement and achieve our short-term target of a 20 per cent reduction in emission intensity by 2018. While this was a great first step in mitigating climate change and decarbonising our portfolio, our absolute emissions grew because of acquisition and development activity (albeit by a much lesser amount than if we had done nothing).

We know that to tackle climate change effectively, our total or absolute emissions must go down. So moving forward, we will be targeting an absolute reduction. We'll continue to use intensity targets internally to help drive continuous improvement.

16. Can you describe your methodology in more detail?

In order to develop the Planet Positive plan, we put together a cross-functional working group. This group drew on extensive building operations and design experience, energy procurement experience, and knowledge of our business.

We developed the net positive model in-house and asked highly regarded, independent consultants to critically peer review it. We constructed the model at an asset level to provide inbuilt flexibility as our portfolio grows and changes.

Rather than over-complicate the model and introduce significant uncertainty by trying to factor in changes to energy consumption as a result of variations in amenity, operating hours, and the like, we've assumed for existing assets under our operational control, that there will be no change in business as usual consumption.

A more detailed breakdown of our methodology is available from Mirvac on request.

17. Why have you included refrigerants?

A lot of commercial refrigerants have high global warming potential (GWP). This is a relative measure that indicates how much a given mass of refrigerant contributes to global warming (calculated by comparing the amount of heat trapped by greenhouse gas to the amount of heat trapped in the same mass of carbon dioxide).

For example, one of the most common refrigerants, R134A, has a global warming potential of 1,300. This means that one kilogram of R134A that leaks or needs to be topped up in our air conditioning plant is the equivalent of 1,300 kilograms of CO_2-e. Including refrigerant emissions in our net positive scope provides a more accurate picture of what operational carbon emissions result from our buildings than purely energy only emissions.

Our approach to reducing emissions associated with refrigerant use is threefold. Firstly, we always plan to eliminate and minimise leaks. Secondly, we use the most effective refrigerant. Thirdly, we continue to investigate new low GWP alternatives for high GWP refrigerants.

18. How are scope 3 emissions being used to offset scope 1 and 2 emissions?

Our reach across several different sectors of the property industry enables us to consider how emission reduction activities (and the social benefits that may come with them) could be targeted to the areas where they'll have the greatest benefit. We have developed the influence component of our Planet Positive plan with this scope 3 emission reduction in mind, and these scope 3 reductions currently account for less than five per cent of our net positive preferred pathways.

Our influence strategy is an innovative pathway that allows all parts of Mirvac to contribute to the achievement of our net positive carbon target. Through this strategy, our residential division and industrial portfolio contribute to our net positive roadmap. Initiatives such as the installation of solar by Mirvac on these assets directly benefits the tenants of our industrial sheds, or the buyers of our homes and apartments.

We will show renewable energy generation and other measures to reduce emissions associated with the operation of these assets separately when we report on net positive progress to demonstrate areas of investment outside our operational control.

Developing a clear methodology for the treatment of these emission reductions that contribute to our net positive position also has value from a risk mitigation perspective. It is not clear what will happen longer term with carbon offsets with the Paris Agreement expected to increase the demand for and therefore the price of carbon offsets.

19. How did you decide what 'business as usual' would look like for Mirvac in 2030?

There's a high degree of uncertainty about what the Mirvac portfolio may look like in 2030 and beyond, given the number of factors that may impact our emissions – such as the rise of mixed-use precinct and increased amenity. Rather than make predictions about these unknown factors, we developed a BAU emissions scenario that assumes there will be no change to energy intensity – but this scenario also has scope to flex according to possible change.

The commercial development pipeline is largely known through to FY25. Beyond this, we applied a development rate based on likely acquisition and redevelopment following consultation with our capital transactions team. While BTR is a new asset class, we are confident that it will grow at a reasonable rate through to FY30 and beyond and have built the BAU scenario based on a moderate delivery of BTR assets.

20. Will you release the detailed modelling or financial modelling?

Since some aspects are commercial in confidence, we will not be releasing the detailed energy and emission modelling, or the financial modelling. However, we can say that our model was peer reviewed and demonstrates that net positive will have clear commercial benefits – and there will also be broader benefits, such as long-term price certainty, particularly with longer-term renewable energy supply agreements.

21. Have you factored in climate change and a warmer climate?

Not explicitly at this point. We have utilised energy and emissions data from FY13-FY18 to develop our model which shows four of the five hottest years are captured by this data, embedding current conditions into the model. We are currently undertaking a climate risk project that will be factored into subsequent models and our TCFD reporting.

22. How did you treat co-generation?

While co-generation and tri-generation has certainly helped us lower emissions to date, we see it as a transition strategy only. As gas prices continue to rise, and as we move to 100 per cent renewable energy, co-generation's contribution will diminish.

We've modelled existing co-generation plant as retiring when the current contract expires with a couple of exceptions. When this occurs, we have modelled the electrical load and cooling load to be supplied by the grid, while the heating load is provided by gas. We will look to replace gas infrastructure (with electric) when it becomes cost-effective to do so.

23. Are you getting the net positive numbers assured?

The initial strategy, roadmap and model have been reviewed by independent industry experts.

As reporting evolves to include market-based alongside location-based factors (as required for NGER reporting), we intend to expand the scope of assurance to include our progress to net positive.

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