## E-MISSION ZERO Leading Australia's transport Network to zero emissions



emeraldcoaches

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# **EXECUTIVE SUMMARY**

Significant research has been undertaken into practical strategies to transform Australia's transport networks for the better, with many recommendations ready to be implemented this decade. What is needed is a first step.

Emerald Coaches is a regional transport service based in Emerald & Mackay, Queensland. We operate a fleet of buses and transport vehicles, with a primary focus on moving people safely and efficiently.

We see first hand the opportunities and environmental challenges of the resources sector, and - like many others - recognise that the future is in cleaner, greener, and sustainable technology and services. Emerald Coaches has made a significant commitment to achieve net zero carbon emissions by 2040. To achieve this, we are transforming our fleet of transport vehicles from diesel engine to Hydrogen Fuel Cell over the next two decades.

Emerald Coaches has embarked on this journey to not only reduce our overall impact on the environment and air quality, but to also provide our business with fuel resilience and security, and taking the lead on next generation job development and training.

Emerald Coaches is the first passenger transport operator in Australia to commit to a zero emissions target. We have named this strategy e-Mission Zero to encapsulate our emission reduction goals and our environmental mission towards 2040

This document explains the relevant technology and how it applies to our business, as well as the actions that are required of Emerald Coaches to achieve our zero emissions target.



## **THE E-MISSION ZERO STRATEGY ENCAPSULATES OUR EMISSION REDUCTION GOALS AND OUR ENVIRONMENTAL MISSION TOWARDS 2040.**

## **EMERALD COACHES**

Emerald Coaches operate passenger transport services in the route, school, charter, mining and vehicle hire sectors throughout the greater Emerald area, the Bowen Basin, Mackay and regional Queensland.

Our diverse fleet of 120 vehicles ranging from 12 to 61 seats and our geographical coverage enables us to effectively service our growing client base.

Founded in 1981, our 120 staff operate from modern depot facilities based in Emerald and Mackay, incorporating administration, workshop, bodyshop, refuelling and vehicle detailing. Emerald Coaches operates a diesel-based fleet of vehicles which consumes over 1 million litres per annum, producing 3,100 tonnes of GHG emissions.

Emerald Coaches is a Queensland Family business owned and led by Michael Baulch. Michael is a fourth generation member of a public transportation family. Michael is currently the Chairman of the Queensland Bus Industry Council and represents Qld as a Board Member of the Bus Industry Confederation and the Australian Public Transport Industry Association.



# **VISION AND CONTEXT**

Our vision is to transform Emerald Coaches into Australia's first zeroemissions passenger transport fleet - a pioneer in the movement towards renewable energy powered public transport, and a model that inspires organisations globally.

Reducing emissions is one of society's greatest challenges and a risk to the future of our business. Reducing emissions requires all of us to act with great urgency. As one of the largest passenger transport operators in Queensland, we have the size, scale and reach to influence others and to inspire collective action.

Our vision is to shift from being an organisation that imports refined fossil fuels that are transported long distances to being a completely self-sufficient producer and end user of zero emissions fuels.

We currently produce 3,100 tonnes of CO2 per annum. Our e-Mission Zero commitment is to produce net zero CO2 emissions by 2040. One of our major milestone goals is to achieve a 50% reduction by 2030.

Emerald Coaches will be the first passenger transport fleet in Australia to commit to a Zero Emissions strategy and will play a significant role in pioneering the movement to zero emissions public transport.

The technology being employed in our pursuit of e-Mission Zero is technically feasible and has been well utilised in Europe and the United States. We will replace our current Internal Combustion Engine Fleet with Hydrogen Fuel Cell electric vehicles that are much quieter to run and produce zero CO2 emissions. We will begin with an initial order of four vehicles operating from our Emerald depot, with a target of 50 HFC vehicles operating by 2030.

e-Mission Zero addresses the bus industry issue of driver fatigue and the many related problems that flow from that. The transition to Hydrogen Fuel Cell Electric Buses (HFCEB) will significantly reduce driver fatigue and stress. e-Mission Zero will also improve the health of the community through a significant reduction in noise emissions, in addition to reducing carbon emissions to zero.

Emerald Coaches passengers will be delighted to ride our new HFC buses, because they are better for the environment and provide a higher quality passenger experience.

Our Emerald Coaches team will experience more meaning in their work through a sense of shared purpose and contribution to the planet.

Our clients and suppliers will be refreshed by doing business with us, as we inspire them to implement e-Mission Zero principles within their own organisations.

## **OBJECTIVES**

PROVIDE E-MISSION ZERO 2040 LEADERSHIP	TO ENSURE THE EFFECTIVE AND SUCCESSFUL LEADERSHIP OF E-MIS
EMPOWER OUR PEOPLE	TO CREATE STRONG ENGAGEMENT BETWEEN OUR PEOPLE AND THE V
INVOLVE OUR SUPPLIERS	TO CREATE STRONG ENGAGEMENT BETWEEN OUR SUPPLIERS AND THE W E-MISSION ZERO, GOING BEYOND JUST THE SIMPLE COST DRIVERS, AND I ENVIRONMENTAL IMPACT AS THE PRIMARY FOCUS FOR OUR PROCUREMENT
TRANSFORM OUR SERVICES	TO OPTIMISE ROUTES AND VEHICLE MOVEMENTS SO THAT WE USE OU VEHICLES MORE EFFICIENTLY, REDUCING ENVIRONMENTAL EMISSION LINE WITH OUR E-MZ 2040 GOAL FOR NET ZERO CARBON EMISSIONS.
PLAN OUR FLEET TRANSITION	TO TRANSITION TO ZERO EMISSIONS HFC BUSES OVER THE NEXT 20 Y
<b>SELF SUFFICIENT DEPOTS BY 2025</b>	TO HAVE OUR FACILITIES FULLY SELF-SUSTAINABLE BY 2025, INCLU SOLAR PANEL GENERATED ELECTRICITY, RECYCLING AND RAINWATE
AWARENESS GENERATION	TO BUILD A STRONG BRAND FOR E-MISSION ZERO THAT GENERATES A AWARENESS OF OUR NET ZERO CARBON EMISSIONS WORK AND INSPI TO ADOPT THE SAME PHILOSOPHY OF REDUCING ENVIRONMENTAL IM

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## WHERE WE ARE NOW

The direct combustion of fuels in transport are the third biggest contributor to CO2 emissions, behind the electricity and stationary energy sectors in Australia. Transport 45% higher than Europe, and it is emissions have increased by at least 63.5% (39.0Mt CO2e) between 1990 and June 2019, making transport the fastest growing source of emissions in Australia. This is faster than Australia's population growth rate over the same period. Official government projections predict additional growth of 7% over the next decade to 2030 (Climate Works Australia, Moving to Zero, June 2020).

Emerald Coaches e-Mission Zero 2040 shows our commitment to reducing carbon emissions. Strategically, this plan aligns with the International, Federal and State strategies and plans outlined in Figure 3 opposite:

Growing diesel consumption in road transport, particularly passenger and light commercial vehicles (such as utility vehicles) is a major contributing factor to Australia's transport emissions. Australia's road vehicle fleet is one

of the most energy and emissionsintensive fleets in the world. Australia's average emissions intensity for passenger vehicles is one of only six OECD (Organization for Economic Cooperation and Development) countries without vehicle emissions standards.

Electric vehicles account for 0.6% of Australia's vehicle fleet, as compared to 3.8% in Europe and 4.7% in China. Australia can overcome existing barriers to electric vehicle uptake with increased national coordination and support. The tide is turning, with a 203% increase in electric vehicle purchases between 2018 and 2019.

Over the same period, fossil-fuelled car sales declined 7.8%. Policies like the ACT Government's fleet transition to zero-emissions vehicles by 2021 are driving change.



Australia's performance globally in the area of transport energy efficiency.

emissions in Australia.

## **AUSTRALIA'S ROAD VEHICLE FLEET IS ONE OF THE MOST ENERGY AND EMISSIONS-INTENSIVE FLEETS IN THE WORLD. AUSTRALIA'S AVERAGE EMISSIONS INTENSITY FOR PASSENGER VEHICLES IS 45% HIGHER THAN EUROPE**

### Breakdown by state of annual transport

AUSTRALIA'S



## **HOW DOES HYDROGEN WORK?**



• Hydrogen is flammable, but it is inherently safer than conventional fossil fuels Hydrogen fuel cell technologies are mature in their safety features • Collision sensors are designed to activate a "safe shutdown" Hydrogen is already produced, transported and used in large volumes • Fuel cell systems for motive applications are designed and built for safety • The protocols for safe storage and refueling are well developed and understood

Hydrogen is a clean fuel that, when consumed in a fuel cell, produces only water. Hydrogen can be produced from a variety of domestic resources, including renewable power like solar and wind.

Unlike battery electric vehicles which get their power from a built-in battery charged from an external power source, hydrogen vehicles produce energy internally using a fuel cell.

Hydrogen stored in the vehicle's fuel tank reacts with oxygen in the fuel-cell stack through a process called reverse electrolysis which produces electrical energy, heat and water.

#### How safe is hydrogen?

## **TRANSFORMING TRANSPORT**

Emerald Coaches has been actively involved in the search for suitable zero emissions vehicle for our operations for several years. Hybrid, Battery Electric (BEB) and Hydrogen Fuel Cell Electric Buses (HFCEB) have been considered as an operational alternative to our current fleet of fossil fuelled vehicles. Emerald Coaches preference sits with the adoption of a HFCEB fleet, allowing similar operational and refuelling procedures as the status quo.

A transition to Fuel Cell vehicles will also allow on site generation of fuels at the depot with the installation of additional renewable generation, Hydrogen Electrolyser infrastructure and dispensing equipment. This strengthens Emerald Coaches fuel security and allows us to have clarity and control of our fuel supply and price.

Australia currently does not meet its domestic fuel reserve targets set by the International Energy Agency

(IEA), with approximately 90% of fuels used derived from oil sourced from overseas. Domestically produced large volumes of green hydrogen could help mitigate the risk of fuel disruptions. Transitioning to internal fuel supply allows Emerald Coaches the ability to remove potential supply interruption outside of our control.

Driver fatigue has been a prominent awareness of the substantial consideration for Emerald Coaches and the bus industry over many years. It is a leading cause of death in the transportation industry and can impair the driving performance in all driving tasks.

Bus drivers are exposed to a wide range of occupational factors that potentially increase their vulnerability to fatigue, including prolonged driving conditions, 24hour operations, variable shift patterns, and traffic congestion. Heat, noise, and vibration have also been shown to impact fatigue and increase stress levels of

drivers highlighting the importance of bus condition and design. The transition to HFCEB's will significantly reduce these factors.

In addition, the broader challenge of community noise pollution is on the agenda of virtually every community. The effects of excess noise on public health are well-documented and there is also increasing costs arising from noise. With our silent HFCEBs, noise emissions are reduced to a minimum.

To address the problems brought by a fossil fuel dependent transport model including carbon emissions, related noise emissions, negative impact on health of drivers and wider community, and potential fuel supply interruption, we have created e-Mission Zero as a solution to these challenges. There are a number of key ideas and projects that make up e-Mission Zero. These ideas and projects are described in the next section.



Advantages of hydrogen

**FROM OVERSEAS** 



## **AUSTRALIA CURRENTLY DOES NOT MEET ITS DOMESTIC FUEL RESERVE TARGETS SET BY THE IEA, WITH APPROXIMATELY 90% OF FUELS USED DERIVED FROM OIL SOURCED**





## **ROADMAP TO ZERO**

## THE PROJECTS AND RELATED OBJECTIVES THAT MAKE UP E-MISSION ZERO INCLUDE:







### e-Mission Zero Leadership

#### **Project Objective:**

To ensure the effective and successful leadership of e-Mission Zero.

#### **Project Description:**

The success of e-Mission Zero (e-MZ) relies primarily on the effectiveness of our leadership. Through e-MZ, Emerald Coaches is committed to our zero emissions objectives by 2040.

The leadership of e-MZ is not purely a senior leadership task. The leadership of this project will involve every member of the Emerald Coaches team. The core leadership tasks for this mission will include:

- Facilitating a positive e-MZ culture and continuous improvement of environmental systems to support our objectives;
- Allocating necessary resources of personnel, facilities and equipment;
- Demonstrating behaviours that set the standard in promoting environmental excellence and exemplary practices in all areas of our business;
- Being a direct and active participant in the work and operational environment, promoting and leading behavioural based practices;
- Leading e-MZ objectives that ensure effective

environmental management in all Emerald Coaches activities, facilitating relevant communications within our work force and extending to Client and contractor work forces;

- Implementing incentive programs and ensuring recognition for e-MZ performance; and
- Ensuring Emerald Coaches personnel are fully engaged in the e-MZ objectives.

Emerald Coaches has employed an experienced environmental professional to lead our transition to zero emissions, which will sit within our newly developed Sustainability Division. This person will champion our e-MZ vision across the entire business, oversee our environmental management, have primary responsibility for achieving our net zero emissions target and related milestones, and assist in compliance with statutory environmental requirements. The e-MZ Leader will lead the integration of e-MZ systems into being part of the "business as usual" EMC operations, access government support initiatives, assist in the training of our people, and audit, analyse, report and communicate e-MZ and its progress to employees, customers, clients and senior management.

It is expected that this role will develop into assisting all levels of government and passenger transport operators in moving to zero emissions transport. Through our E-MZ Leader, we will use our voice to galvanize action. We know that we are a small piece of the puzzle. Emerald Coaches will continue working with employees, suppliers, industry, consumers, clients, governments, NGOs and communities where we operate, to forge new and deeper levels of engagement on climate issues.

### WE WILL TRANSPARENTLY ADVOCATE FOR CLEAR AND FAIR STANDARDS AND REGULATION THAT SUPPORT SECTOR WIDE EFFORTS, AND FOR NECESSARY PUBLIC POLICIES TO ENABLE THE TRANSFORMATION OF ECONOMIC AND SOCIAL SYSTEMS FOR A NET ZERO CARBON FUTURE.

One of the first steps in the resource provision and develop of this Strategy is the employment of our e-Mission Zero Champion, our Environmental and Sustainability Coordinator.



## **Our People**

#### **Project Objective:**

To create strong engagement between our people and the work of e-Mission Zero.

#### **Project Description:**

Another critical ingredient to the success of e-MZ is the strength of engagement our people have with this mission.

The strength of engagement will be determined by the extent to which our people are inspired by both the overall vision of e-MZ and their vision for how they will play a part in that.

Emerald Coaches believe that engagement of our employees in e-MZ is an effective way to motivate staff and successfully achieve our goals. By taking a strategic approach to engagement, we can establish shared ownership of our e-MZ target and ensure that we are held to account. Our robust and clear strategy will include employee engagement at its core.

**INCREASED STAFF ENGAGEMENT AND A COLLECTIVE DRIVE TOWARDS E-MZ WILL LEAD TO INCREASED PRODUCTIVITY, BETTER STAFF RETENTION AND THE ABILITY TO ATTRACT THE BEST TALENT.** 

Emerald Coaches aims to educate, inspire and motivate internal employees to change their behaviour both in and outside of their employment.

Small actions can make a big difference. Emerald Coaches is committed to developing staff training and awareness programs to promote an understanding of the benefits of our e-MZ Strategy. Emerald Coaches is committed to aligning personal and business values, providing our employees with reciprocal obligations and mutual commitments that define our relationship. Successfully integrating sustainability into our business requires strong leadership to reconcile the gap between personal and corporate values.

In relation to employees, Emerald Coaches will ensure e-MZ is integrated into job descriptions and training programs and sustainability targets are measured and conveyed to employees regularly. e-MZ performance will be rewarded and recognised and we will set performance expectations that align with the goals set out in this strategy.

#### LEVEL 2 LEVEL1 Baseline training requirements for all General Service and persons working around ZEBs Maintenance operations Mechanics Drivers Auto Electricians Yard operations All service and repairers Wheel service Accessory fitters **Nationally Recognised Skill Sets** Salvage Emergency response for existing workers

#### EMERALD COACHES TRAINING PATHWAY



#### LEVEL 3

Master Service Technician **Electric Vehicles** 

- For specialist technicians involved in repairs to high voltage systems and components
- Brand specific training



## Sourcing

#### **Project Objective:**

To create strong engagement between our suppliers and the work of e-MZ, going beyond just the simple cost drivers, and incorporating environmental impact as the primary focus for our procurement process.

#### **Project Description:**

e-MZ will clearly detail our phasing out of fossil fuel energy sources and related infrastructure. We will engage with Emerald Coaches suppliers and contractors regarding carbon accounting, point of purchase carbon offsetting and carbon reduction opportunities.

Emerald Coaches will work closely with suppliers to source our consumables and services in a way that generates positive environmental and social impacts. We will ensure that our business principles and those of our suppliers align with e-MZ. From our traditional cost and quality based procurement methods, Emerald Coaches will evaluate and implement sustainability metrics within the procurement decision making process.

As part of this commitment, Emerald Coaches will develop a Responsible Sourcing Policy (RSP). Our RSP will embody our commitment to conduct business with integrity and transparency, and with respect for universal human and labour rights, and environmental sustainability.

Our RSP will be a key component of ensuring that our supply chain is in alignment with our e-Mission Zero Strategy. In consultation with our suppliers, we will regularly review our RSP and adapt our approach to achieve the greatest impact.









## Transforming our Services

#### **Project Objective:**

To optimise routes and vehicle movements so that we use our vehicles more efficiently, reducing environmental emissions in line with our e-MZ 2040 goal for net zero carbon emissions.

#### **Project Description:**

This project will require the creation of new, low-carbon offerings and the reformulation of existing services with a lower carbon footprint.

Emerald Coaches will calculate efficiencies by analysing morning and afternoon Peak Vehicle Requirements (PVR), vehicle locations and routes. From this data, we will create what-if scenarios, to accurately forecast the financial impact of business decisions and find the best combinations of workforce, vehicle and schedule to meet our service requirements. Optimising our crew, fleet, rosters and route network will lead to better productivity and emissions savings. Our Coach Manager Scheduling system aligned with our GPS programs, will be utilised to provide detailed route kilometres, passenger numbers, departure and arrival reports and depot dispatch details. This will give us baseline data and control of our fleet, as well as the intelligence we need to refine operations and minimise repositioning and dead running.

We will analyse our routes to increase our operational efficiency and not be constrained by historical route planning.

Emerald Coaches will embrace technological change that will play an important part in the future of this project. Emerging and disruptive technologies such as driverless vehicles, ride sharing, ride sourcing, transport applications, mobility-asa-service and other innovations will redefine how people are moved.



## Self-Sustainability by 2025

#### **Project Objective:**

To have our facilities fully selfsustainable by 2025, including renewable generated electricity, recycling and rainwater.

#### **Project Description:**

Emerald Coaches will implement energy efficiency measures to reduce the overall amount of energy we use. As part of this objective we will switch to 100% renewable electricity and water in our facilities by 2025.

This will require significant investment into our power and water infrastructure, as well as a detailed plan to reduce and ultimately eliminate our use of non-renewable resources.

Initially this will include gathering baseline data to be able to determine the actions needed. Some of our depots currently have solar panels, rainwater capture and water recycling. These initiatives will be expanded to include all depots, workshops and offices. We are committed to implementing:

- Solar panels for Workshop and Office functions;
- Solar and time delay lighting;
- Recycle & rainwater systems;
- Paperless training and induction procedures;
- Paperless driver rostering through our employee portal;
- Paperless defect reporting through our Walk Around App;
- Paperless vehicle maintenance procedures and recording;
- Electric, water efficient mobile vehicle washing units.





RAIN





## **Fleet Transition**

#### **Project Objective:**

To transition to zero emissions HFC Buses over the next 20 years.

#### **Project Description:**

Emerald Coaches will transition our fleet from the current predominantly diesel-powered internal combustion engine vehicles to HFC Buses by 2040, with half the fleet converted by 2030.

This transition will take foresight and planning to allow us to continue to operate a flexible and integrated fleet to service our varied clients.

This planned transition is already well advanced, with Emerald Coaches recently conducting Expressions of Interest (EOI) for the supply of HFC vehicles. The technology being employed in our pursuit of e-Mission Zero is technically feasible and has been well utilised in China, Europe and the US.

In addition, Emerald Coaches ran an EOI process for the supply of refuelling infrastructure in late 2019. We will

develop depot infrastructure which will allow on site fuel generation, further reducing the emissions associated with the transportation of our current fuel supply. Until this becomes a reality, we have enacted discussions with renewable hydrogen suppliers to secure an appropriate supply contract that is able to ramp up as our fleet expands.

Following the announcement of Emerald Coaches e-Mission Zero 2040, we will be working through a Memorandum of Understanding between Emerald Coaches, H2 Energy (the green hydrogen and refuelling company) and Bus and Coach International, the Australian chassis and body supplier.

The conversion of the fleet will first be dependent on the available infrastructure and ADR compliant vehicles. We will detail the timing of this development and then create a clear pathway on our fleet replacement program. The e-Mission Zero Leader will work closely with the Emerald Coaches Suppliers, Fleet and Finance departments to create a detailed, timely and fully costed program.



### Awareness Generation

#### **Project Objective:**

To build a strong brand for e-Mission Zero that generates widespread awareness of our net zero carbon emissions work and inspires others to adopt the same philosophy of reducing environmental impact.

#### **Project Description:**

Emerald Coaches will lead, motivate and implement its environmental philosophy, generating awareness of the program and our journey towards zero emissions 2040.

Our brand will play a critical role in our journey toward e-Mission Zero. To ensure we consolidate our market position and the Emerald Coaches e-MZ vision, our communications strategy will incorporate:

- Commencement of e-Mission Zero, including launch event to declare goals, aspirations and implementation plan for this project;
- Brand development and implementation, including branding, signage and livery;
- Digital media including social media engagement plan and Emerald Coaches e-MZ website;
- Community engagement & awareness campaign involving hydrogen fuel educational marketing campaign, sponsorships, events and activations;
- Thought leadership including government engagement, industry media opportunities,

industry event opportunities;

- Internal communications including employer brand, employee engagement, employee awareness campaign, e-MZ within QA, procedures and employment documents, e-MZ Vision & Mission documents internally around the depot, RFP, and capability statement;
- Eco-friendly asset upgrades (e-Mission Zero in action), fleet, depots, refuelling stations;
- Milestone achievements including timeframes, goals, expectation and outcomes.

With e-Mission Zero we will challenge the notion that "a bus is a bus".

### TO US, A BUS IS NOT JUST A BUS. A BUS IS A TANGIBLE REPRESENTATION THAT THROUGH NET ZERO CARBON EMISSIONS WE ARE PRESERVING THE PLANET.

As our passengers ride in our new e-MZ HFC vehicles, their perceptions of bus travel will be transformed. They will experience a new, planet-friendly, healthier way of getting from A to B.





## NEXT STEPS

## JOIN US ON THE ROAD TO EMISSION ZERO

## We are excited to be a pioneer in this area and lead by example.

This document will provide a clear path towards net zero emissions and inspire our employees and stakeholders to be an integral component of the journey and enjoy the ride with us.

In our capital-intensive business, creating a path towards e-MZ requires a laser focus on infrastructure investment. Infrastructure that is not only climate resilient but also offers the best prospects for long-term economic growth and job creation within the Emerald Coaches business.

Emerald Coaches is committed to substantial investment in research, development, and commercialisation to close the gap to zero emissions by 2040.

With a chance to remould and reimagine our future, Emerald Coaches will move past the choice of being good for the economy or good for the environment. We choose to do both.







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