EPC+ CASE STUDY: ECONOMIC IMPACT ANALYSIS

EXECUTIVE SUMMARY

Empire Carbon and Energy (EmpireCaE) has prepared this analysis and case study for GreenTECH, the Australian importer of EPC+.

The EPC+ diesel additive represents a breakthrough solution for diesel fleet operators seeking to optimize fuel efficiency and emissions, while reducing costs. Tests in labs and live fleet test data shows 2%-5% fuel consumption reduction. Our economic analysis demonstrates strong return on investment of >300%, with a payback period of less than 5 months for most applications. EPC+ delivers clear economic benefits while simultaneously Restoring engine performance and reducing emissions.

The risk profile is low, given modest capital investment required, multiple benefits contributing to the economics, and extensive safe usage of the additive worldwide. There is additional upside not included in the economic model, most notably less fuel injector fouling and engine wear, leading to reduced maintenance cost.

INTRODUCTION & PRODUCT OVERVIEW

Diesel fleet operators face challenges including changing fuel prices, stricter emissions regulations, and rising maintenance costs. EPC+ has been developed by TotalEnergies, the only major energy company with in-house R&D capability, developing specialty fuels, oils and lubricants for all levels of oil exploration, production, industry and motorsport. Excellium concentrates with more than 12,000,00km of testing and validation are produced to blend TotalEnergies Excellium premium fuel sold through their networks of 17000+ service stations worldwide. EPC+ now available in Australia through licensed distributor GreenTECH. Assisting companies to reduce cost and emissions from diesel.

EPC+ is a concentrated, patented premium diesel fuel additive, unique in the additives market (see Appendix 1 – EPC+ comparison with main competitors). Its key benefits are:

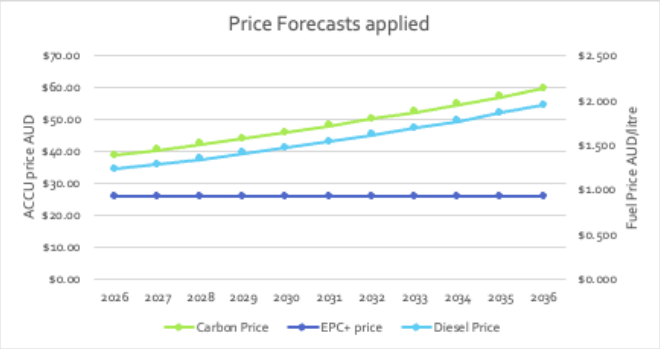
- Improved fuel efficiency.
- Improved emissions footprint.
- Improved engine efficiency & protection.
- Improved fuel durability.

The concentrate is blended into diesel via GreenTECH's automated blending system, as pictured here. The installation of this plug and play kit is the only capital outlay required to start using EPC+, costing approximately AU$50,000 and usually online within 3 months.

In collaboration with Empire Carbon and Energy, we built an economic model to test the benefits in an Australian setting. This case study outlines the economic model inputs, findings and sensitivities for a hypothetical mid-cap mining company.

PERFORMANCE BENEFITS

FUEL EFFICIENCY is one of the key attractions of EPC+, with 3.3% proven benefit in independent laboratory tests. Multiple and ongoing global fleet tests across large numbers of engines and hours have been undertaken, and in these real-life settings, improvements ranged from 2.0%-5.0%.: GreenTech's fleet analysis data showed that here, our benefits mirror these international results delivering a fleet average of 4.0%+.



Our economic analysis uses 4% as a base case, with 2% as a sensitivity. It also has multiple diesel price forecasts built in.

EMISSIONS REDUCTION is a significant benefit, and in a mining context the avoided emissions can generate carbon credits, either for trading as ACCUS or to meet the Safeguard mechanism liabilities. Given the emissions reduction can happen almost immediately, this may provide a transition strategy until other carbon offset or avoidance projects can be put online.

Our model uses a standard assumption of 0.268 t/CO_2-e per litre of diesel and a variety of carbon price forecasts.

OTHER ADDITIVE COST: As fuel efficiency and cleaner engine combustion are achieved, AdBlue use can be reduced by 4% to 10%. GreenTECH's fleet analysis demonstrates benefits based on a 7% average saving. Many diesel engines in Australia currently use AdBlue, but not all. For a transport company, this depends on the fleet make-up. We have chosen to use 50% of the fleet as a cautious estimate.

There are more upsides, both as direct cost and as future enablers. These are discussed in the Risks and Upside section below.

COST AND PRICING ASSUMPTIONS

As discussed in the introduction, the only capital outlay is AU$50,000 for each blending unit. Most transport companies would require one at each major depot, linked to their diesel fuel tank.

The ongoing cost is the purchase of the EPC+. This is blended at 700ppm, or 0.7 litres per 1000 litres of diesel, as per manufacturer's recommendation. A litre of EPC+ costs AU$25.71 ex GST and minimal price increases are assumed.

The cost of diesel is rising based on a 2.2% increase per year. ACCU pricing is based on the market forward curve as of January 31st, 2025.

BUSINESS CASE APPLICATION

We present a hypothetical case study for a mid-sized transport company using a total of 38 million litres of diesel per year. By comparison, Australia Post used about 42 million litres across their operations. According to ABS, the total Australian haulage-related diesel use is approximately 12 billion litres, so our hypothetical transporter represents 0.3% of the industry.

This transport company needs 12 blending facilities to service their fleet. AdBlue is being used in 50% of the company's trucks. The company is big enough to be subject to the Safeguard mechanism. An AU$0.10/litre delivery charge was added onto the diesel pricing forecast.

The model uses a 7.5% (real) WACC with no further discounting. It analyses a 10-year value window only. A full list of all assumptions and pricing forecasts used are in Appendix 2 – Case Study Assumptions.

BASE CASE OUTCOMES

The results table shows an overview of the value of EPC+ over a 10-year period.

EPC+ saved a stunning nearAU$25million and over 44 kt of CO_2-e emissions.

The project payback time is under 9 months, which means it can be done within an annual budget.

GreenTECH Value Assesment Model
Portfolio: Transport Company with Safeguard

Active Price Scenarios

Diesel Price	Rising Diesel Price Forecast
Carbon Price	ACCU Price | Forward Curve

Fuel volume to which ECP + applied (average pa)	38,000,000	litres
Fuel savings (average pa)	1,520,000	litres

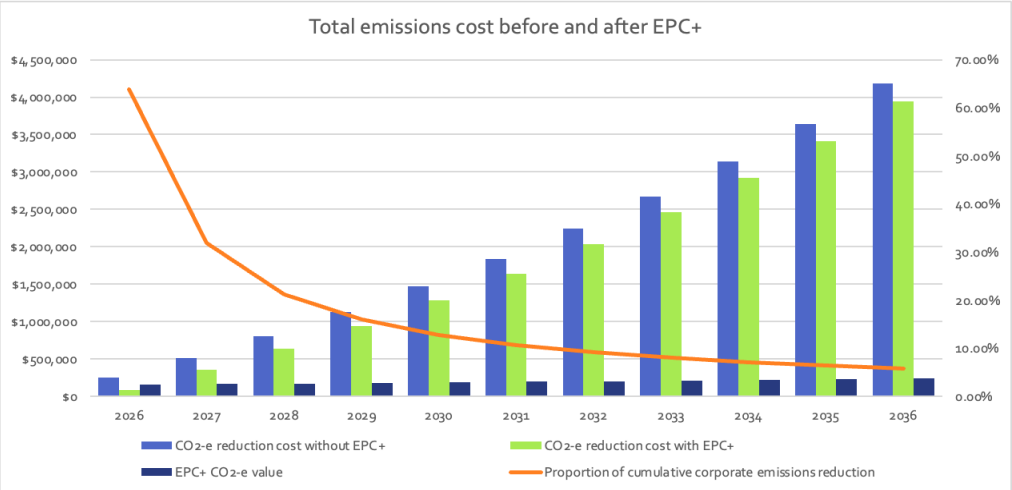
Summary Table

Success Measure	Unit	Value
Fuel Savings: litres	litres	16,720,000
Total Savings: $ (all sources)	$	$24,857,450
Average Annual Fuel Savings	litres	1,520,000
Total emissions avoided	tCO2-e	44,810
Total Average Annual Savings: $ (all sources)	$	$2,259,768
Project NPV	$	$10,510,809
Project RoI (10 years)	%	306%
Project RoI year 1	%	144%
Project RoI year 2	%	281%
Approximate payback time	months	8.3

The business case becomes stronger when considering the cost of offsets for those facilities under the Safeguard Mechanism.

These facilities have to surrender Australian Carbon Credit Units (ACCU's) to comply with a year-on-year reduction target. Without other initiatives to reduce emissions, these ACCU's would have to be bought at market prices.

The graph below highlights the difference – the cost to abate carbon emissions using EPC+ is only AU$0.06 per litre of EPC. Without EPC+, the cost of compliance would have been an additional



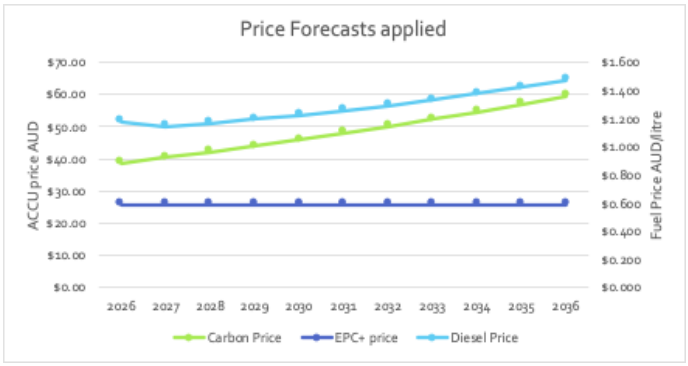
AU$2.1million. This makes the differential NPV AU$11.9 million, a 13% increase.

Given the strong economic results, we undertook the checking the strength of these outcomes. We stress tested them against various risks and sensitivities.

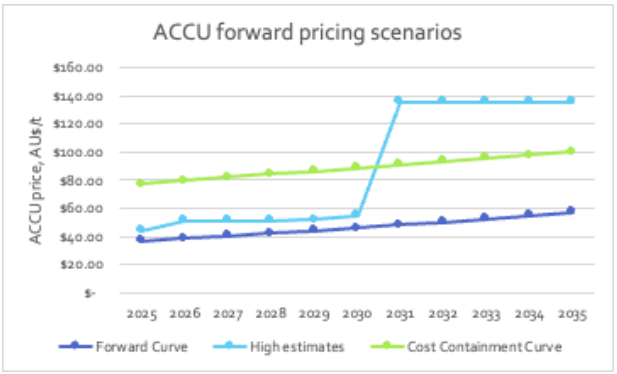
RISKS AND SENSITIVITIES

The following risks to the economics have been identified, and run as sensitivities:

- **Fuel efficiency**. As per the section on benefits, 4.1% has been measured in fleet trials in Australia. This was rounded down to 4%. However, the lowest field trial outcome was 2.4% and the lowest laboratory outcome was 2%. Therefore, a scenario where 2% fuel efficiency is achieved was run.
- **Capital costs overrun**. Sadly, it is not uncommon for capital projects to overrun. The blending system is largely 'plug and play' and readily transportable by road so this risk has been reduced by design. However, it is possible that custom requirements would need to be added on. This has been run as a scenario with a 25% increase in capital costs for all 12 units.

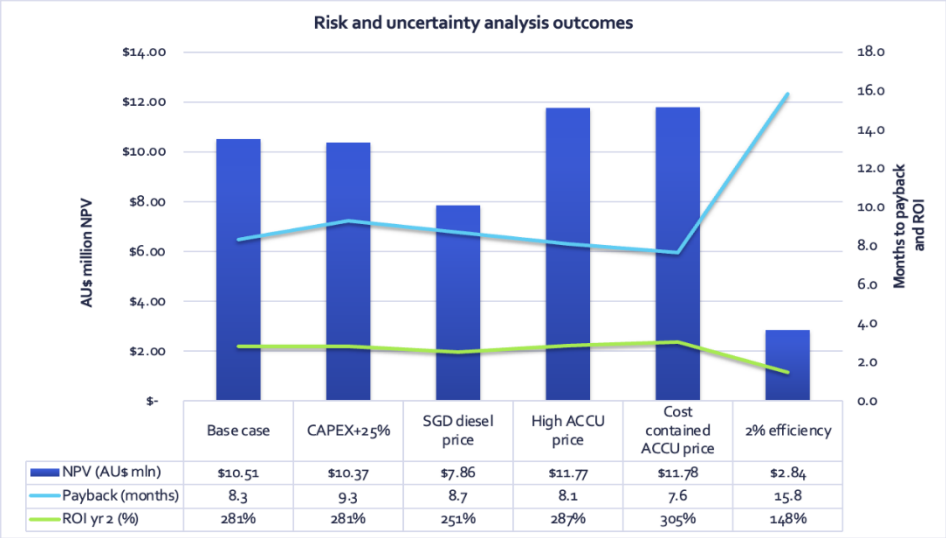


- **Diesel pricing**. The base case assumed a steadily rising diesel cost, as per price graph above. This is in line with historical macro-trends; however, it is possible that lower growth, or even temporary drops in diesel price occurs. The SGD Futures model is representative of this and is displayed here. Note both the shape of the curve and the absolute cost of diesel is substantially below the base case.
- As the Safeguard mechanism and reporting requirements have started to affect business from this year for the first time, **ACCU pricing** is also uncertain. With a large range of forecasts available, the default used is the forward curve as of January 31st, 2025. A sensitivity on the high side was run based on CSIRO 2024 analysis of cost to serve prices. Similarly, a sensitivity was run based on cost containment as per current legislated formula.



- **Break-even and payback time** analysis – the faster a project breaks even, the lower the overall risk to the economics, as the commercial, legislative, social and technical environment has less time to change. For all scenarios run, the payback time has been reported. Also, a goal seeking scenario was run to find the minimum diesel usage that would pay back the AU$600k capital outlay. Finally, another way to look at this is to calculate the amount of blending units to break even.

The results of the risk and sensitivity runs are summarised in the graph below. Most notable is that the NPV never gets close to being negative, the payback time never goes over 16 months and the ROI over just the first two years does not drop below 148%.



	Base case	CAPEX+25%	SGD diesel price	High ACCU price	Cost contained ACCU price	2% efficiency
NPV (AU$ mln)	$10.51	$10.37	$7.86	$11.77	$11.78	$2.84
Payback (months)	8.3	9.3	8.7	8.1	7.6	15.8
ROI yr 2 (%)	281%	281%	251%	287%	305%	148%

The break-even volume of diesel to reach a zero NPV is 1,916,000 litres per year, which is a 95% reduction in volume. Breakeven is also achieved with the original 38,000,000 litres per year but paying for 238 blending units. To put this in perspective, this would likely be a blending unit for approximately every 2 trucks.

Physical risk assessments were not done for this case study. It is however worthwhile noting that in 20 years of development and evolution over 12 million kilometres have been travelled during testing and validation and worldwide Excellium premium diesel distributed in bulk or from TotalEnergies 17,000+ service stations has seen Excellium premium diesel used in every make and model of engine since 2005... No issues or 'black swan' events have been reported over this period, which makes any physical risk associated with the use of EPC+ low. Physical risk to the capital exposure (e.g. SimOps) have been captured in the 50% capital overrun scenario.

UPSIDE

There are additional benefits from the use of EPC+ that have not been taken into the economic model. The most notable ones are maintenance reductions, refuel and compatibility with renewable and biofuels.

MAINTENANCE COST REDUCTION: EPC+ has been proven in laboratory tests to reverse existing fouling by Up to 97% and prevent future fouling by up to 99%. These tests were performed in a controlled, independent laboratory setting (XUD9 test). It has also been proven to improve HFRR wear reduction in TotalEnergies laboratories. This may lead to higher uptime, lower maintenance and lower lube oil costs.

The EPC+ additive also IMPROVES FOAMING of the diesel, with defoaming time reduced by 62%. These tests were performed to NG M 07-075 standard at TotalEnergies in-house laboratories in France. This means that tank filling is faster, and the tank can be filled fuller.

EPC+ is fully COMPATIBLE WITH BIODIESELS, with FAME-based biofuel ranges tested from 7% to 100%. This allows further decarbonisation to take place without giving up fuel efficiency benefits.

In addition, EPC+ compatible with HVO (Hydrotreated Vegetable Oil) renewable diesel from 30% to 100%.

CONCLUSION & NEXT STEPS

EPC+ diesel additive delivers excellent economic and performance benefits across all measured parameters. With its rapid payback period and high ROI, EPC+ represents a rare opportunity to significantly reduce operational costs while simultaneously improving environmental impact and associated compliance costs.

Recommended implementation approach:

1. Establish baseline metrics and monitoring protocols
2. Where applicable register an ACCU project
3. Implement EPC+ treatment across the full fleet
4. Track and document benefits

Contact our technical team today to discuss how EPC+ can be adapted to your specific operational requirements and to arrange a demonstration of our economic modelling tool tailored to your fleet profile.

APPENDIX 1 – EPC+ COMPARISON WITH MAIN COMPETITORS

Active ingredients	TotalEnergies Excellium	SHELL V-Power	BP Ultimate	AMPOL Amplify	711 / Mobile Diesel Efficient	Caltex Techron® D
Deposit control – preventing injector fouling and removing deposits.						
Cetane improver – improving combustion efficiency						
Friction modifiers – improving lubricity, while reducing friction and wear.						
Corrosion inhibitors – protecting against rust and extending life.						
Antioxidant – slowing fuel degradation and increasing stability.						
Demulsifier – separating water and reducing risk of microbial growth.						

Antifoaming agent – saving time on fuelling by up to 62%.						

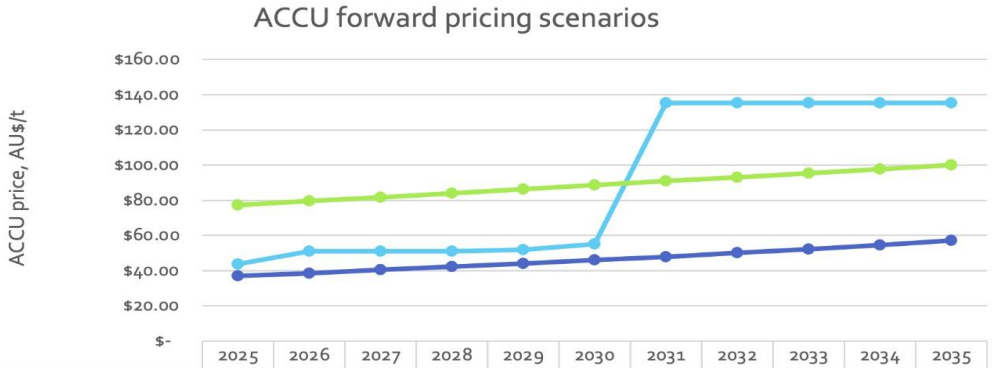
APPENDIX 2 – CASE STUDY ASSUMPTIONS

Scenario data

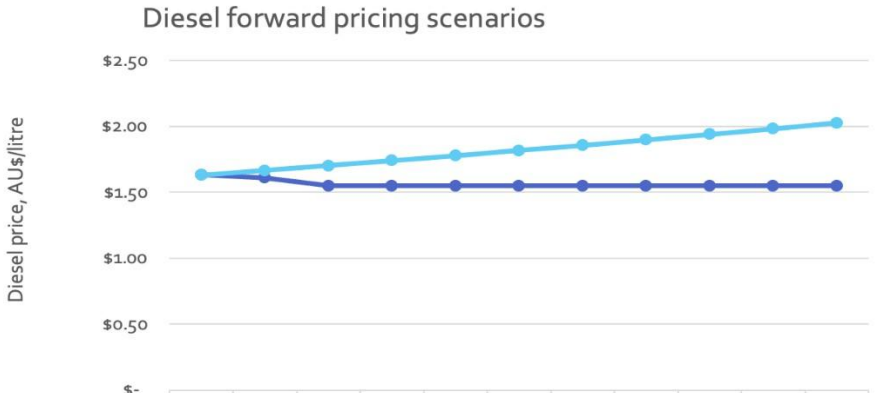
Transport - Safeguard		CTC	
blender installs			12
total proportion of diesel fuel covered			100%
AdBlue			yes
AdBlue fleet proportion			50%
Annual Volume Diesel	litres		38,000,000
Diesel price discount achieved by customer			5%
Site transport cost	$/litre		0.10
transport costs rising per annum	$/litre	%	10%
Baseline emissions	t/CO2-e		106,530
Voluntary emissions requirement (% pa target, Scope 1 & 2)			0.9%

EPC+ Data

Diesel Economy improvement	4%	
Dispensing capital cost	600,000	$
Usage efficiency	0.002680	t/CO2-e per litre of Dies
Adblue used?	yes	(default = yes)
AdBlue savings (as applicable)	99,750	$/litre
AdBlue usage	950,000	
AdBlue fleet proportion	0.50	%
Blend Ratio per 1000 litres of diesel	0.70	



	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Forward Curve	37.00	38.60	40.45	42.20	44.00	45.95	47.99	50.11	52.33	54.65	57.08
High estimates	43.72	51.01	51.01	51.01	51.80	55.00	135.33	135.33	135.33	135.33	135.33
Cost Containment Curve	77.27	79.55	81.82	84.09	86.36	88.64	90.91	93.18	95.45	97.73	100.00



	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
SGD Futures Diesel Price Forecast	1.63	1.61	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55
Rising Diesel Price Forecast	1.63	1.67	1.70	1.74	1.78	1.82	1.86	1.90	1.94	1.98	2.03