Programme Review
Fuel Efficient Tyres

Document purpose:	This document is the result of the programme reviews EECA and MBIE conducted across EECA's programme portfolio in 2016. The reviews were in response to a requirement to reprioritise the EECA's portfolio in the context of the new NZEECS, the new EV programme, and expanded levy. The framework for the review is available here. The reviews were based on existing documentation and workshops with MBIE, PwC and EECA staff.

About the Fuel Efficient Tyres project

Light vehicle fuel use is high and contributes to significant amounts of greenhouse gas emissions. Fuel efficient tyres (FETs) have lower rolling resistance than typical tyres and reduce the fuel use and greenhouse gases emitted per kilometre travelled. However, uptake of fuel efficient tyres is low. The Fuel Efficient Tyre project aims to reduce greenhouse gas emissions from the light vehicle fleet by improving the uptake of fuel efficient tyres. The project endorses tyres that qualify as fuel efficient using an EECA-branded label and establishes partnerships with tyre distributors to encourage tyre buyers to purchase FETs.

The project's key components are:

- Development of a standard and voluntary fuel efficient tyre approval mark for qualifying tyres.
- Check-testing of endorsed tyres against the standard.
- A mass-media marketing and communications campaign to increase consumer awareness of the availability of and benefits associated with FETs.
- Promotion of FETs by tyre manufacturers and distributors.

Note: The project initially included a marketing and communications campaign to increase consumer awareness of the benefits of correctly maintained tyre pressure and how to check and adjust tyre pressure. This component is not included in this report.

Conclusions

The tyre market is not structured in a way that enabled the project to be successful. While distributors were enthusiastic they did not prioritise FETs over non-FETs and did not have sufficient influence over tyre retailers. The project is not cost-effective without a significant shift in the activity of s 9(2)(b)(ii).

The problem definition and options analysis were too narrowly focused on one aspect of the light vehicle fleet which contributes to greenhouse gas emissions – in this instance, the low uptake of fuel efficient tyres. The structure and incentives in the industry mean that a voluntary labelling scheme was always going to struggle. Other intervention options may have been able to provide a better result and enabled the achievement of larger benefits.

While industry was prepared to participate in the project, the right market incentives did not exist for the Programme Partners to prioritise the promotion of FETs over non-FETs. Pricing in the tyre

industry is not transparent which made it difficult to understand this. Further, EECA and the tyre distributors over-estimated the influence the latter have over tyre retailers; this could reflect a 'participant bias' on the part of the tyre distributors. The lack of a clear intervention logic impaired identification of this issue.

The programme did not appropriately segment the market for targeting. There was low interest in tyre characteristics amongst the majority of tyre buyers (70%), yet these were the ones targeted.

A significant shift in the activity of s 9(2)(b)(ii) is necessary to increase uptake of fuel-efficient tyres. Currently, the project does not represent value-for-money and is unlikely to become cost-effective in the future.

Recommendations

EECA should adopt an exit strategy which includes monitoring the scaled-back project for the next financial year and then reassess whether it is worth further investment.

When EECA designs a programme for intervention in the market, it needs to better detect participant bias in market participants to ensure that the desired outcomes are achievable. EECA should undertake market analysis to test or reinforce industry's stated interests. EECA also needs to make better use of market research to target appropriate segments of the market.

EECA has committed to a small amount of funding and resource to maintain a 'minimum viable product' in 2016/17. It is recommended that EECA has an exit strategy in place, consisting of:

- minimal engagement with industry
- maintaining an 'online search' presence
- testing new fuel efficient tyres in the market.

It is recommended that EECA monitor tyre sales data throughout the year and make a judgement on whether to reinvest at the end of the year. EECA should follow industry's lead; if the project continues to not be cost-effective, even at the lower level of investment, it is recommended to exit the market.

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1 The problem

1.1 The programme

The Fuel Efficient Tyre project aims to reduce greenhouse gas emissions from the light vehicle fleet by improving the uptake of tyres with lower rolling resistance (fuel efficient tyres). The project endorses tyres that qualify as fuel efficient using an EECA-branded label and establishes partnerships with tyre distributors to encourage tyre buyers to purchase FETs.

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1.2 The problem

Light vehicle fuel use is high and contributes to significant amounts of greenhouse gas emissions. Fuel efficient tyres can reduce the amount of fuel use and greenhouse gas emissions per kilometre travelled. However, the uptake of more fuel efficient (replacement) tyres by New Zealand's light vehicle owners is low, with market share of around 6%[1]. As a result New Zealand's light vehicle fuel consumption is higher than what is economically rational.

1.3 Market structure

The structure of the tyre industry is an important consideration because FETs are a relatively new product, and supply chain considerations may affect uptake. There are three main actors in the market – distributors, retailers and tyre buyers.

Tyre buyers

Tyres are seen as 'round and black' with little observable differentiation between products. Complemented with being a grudge purchase, this means that consumers do little research into different tyres.

There are some customers that will not consider purchasing FETs: customers who do not have sufficient disposable income to purchase more expensive tyres, those that do not directly experience the benefit of FETs or those who have specific requirements.

Distributors and retailers

New Zealand imports all light vehicle tyres. Distributors import tyres from tyre manufacturers, and then supply retail stores through an affiliated distribution network or wholesale to independent

[1] This is based on consumer survey information (see IPSOS, 2013, EECA Tyres Research), details are available in the benefit-cost-analysis.

stores. Tyre stores are the primary point of interaction with the majority of customers when purchasing tyres, along with mechanics performing Warrant of Fitness (WOF) inspections. Throughout this supply chain the various interactions between distributors and retailers, and retailers and customers, play a part in determining the potential market for FETs.

Distributors appear to have varied and limited engagement with retail stores and managers. Distributors provide product information and promotional material, and a few engage in specific training regarding sales. The highest levels of retailer engagement would be expected to come from those who have a network of franchise retail shops.

Due to the nature of the tyre market – low brand loyalty, low margin, non-discerning consumers and low involved buyers – tyres can't be loss leaders. This means that there is little economic incentive for distributors to invest resource into developing the market for FETs. Distributors have limited resources and the benefit from the investment could go to competitors[2].

An external FET evaluation commissioned in 2015[2] interviewed tyre industry participants and found that there are mixed views on whether FETs are more profitable than other tyres (page 7). Some thought that FET margins were $1.50 to $5 higher for distributors and up to $25 for retailers. However others felt they were equally as profitable as other tyres.

The target market for the project is passive tyre buyers. This audience is more likely to buy tyres as a result of an unplanned need (e.g. WOF failure or recommendation) than active tyre buyers. Active tyre buyers are more likely to replace their tyres without being prompted and are not our target audience[3].

2 Strategic fit

In 2013 the Minister of Energy and Resources requested proposals for measures complementary to the Emissions Trading Scheme (ETS) to reduce carbon dioxide emissions. This project was proposed in response and subsequently approved for funding with EECA's retained earnings. There is no legislative or regulatory mandate.

The New Zealand Energy Strategy 2011-2021 notes that one of the Government's four key priorities is the efficient use of energy. This is to be achieved through 4 focus areas, including an "energy efficient transport system", and by providing "better consumer information to inform energy choices".

The New Zealand Energy Efficiency and Conservation Strategy 2011-16 more specifically aims for "a more energy efficient transport system, with a greater diversity of fuels and alternative energy technologies."

This project contributes to a more energy efficient transport system by aiming to improve the fuel efficiency of light vehicles operating within the existing fleet. The project does this by providing information to consumers to help them choose more energy efficient tyres and understand the

[2] External evaluation by PwC available here.
[3] Marketing and Communications plan available here.

benefits of doing so.

In 2010 the Government launched Safer Journeys, New Zealand's road safety strategy to 2020. Safer Journeys established a vision for New Zealand of "*a safe road system increasingly free of death and serious injury*" and adopted the safe system approach (safe roads and roadsides, speeds, vehicles, and road use). The Action Plan 2013-15 had a target to improve consumer information on tyres.

EECA's Strategic Objectives include the long-term objective that "people access their destinations using less fossil fuels". In the medium term this is described as drivers understanding "the fuel efficiency and cost impacts" of maintenance decisions as well as taking action to reduce fuel usage.

3 Role for government

3.1 Market failures and barriers

If the market were functioning appropriately tyre buyers would understand the benefits of using fuel efficient tyres, prioritise those benefits, demand fuel efficient tyres and be able to identify them at point of purchase. There are two market failures that prevent this from occurring:

1. *Lag time:* There is an expected delay between the deployment and availability of energy-efficient technologies and the uptake of these technologies. FETs are relatively new and are still affected by the bad reputation created by earlier, poor quality versions[4].

2. *Lack of information:* Tyre buyers are not aware of fuel efficient tyres[5] and are also unable to identify them. Information on the fuel efficiency of tyres is not readily available and there are high 'search costs' associated with trying to find it. This means tyre buyers are generally unable to identify FETs when making their purchase decision.

There are additional behavioural barriers that prevent tyre buyers from exhibiting the desired behaviour:

1. *Priorities:* People who make informed/considered tyre purchases prioritise durability, safety, handling and price over fuel efficiency[6]. Greater information could lead to more buyers making it a priority.

2. *Present bias:* FETs can be more expensive than regular tyres[7], and while they can pay for themselves over time, consumers generally have a present bias/high internal discount rate[8].

3.2 Potential benefits

[4] From the external evaluation: "As FETs continue to improve in terms of durability, wet braking and cost, they may be increasingly accepted in the marketplace."
[5] Market research showed that only around a quarter of respondents were aware of fuel efficient tyres.
[6] Market research showed that safety, price, durability and road handling are the tier one factors that people consider when buying a tyre – fuel efficiency is a second tier consideration.
[7] Getting real data is challenging in an industry that does not advertise prices, however industry participants interviewed in the evaluation assume FETs are around $25 more expensive per tyre.
[8] Market research showed that when offered a FET, respondents cited price as the biggest barrier to purchase.

Table 1: *Potential benefits*

Public benefits	Private benefits
• Avoided greenhouse gas emissions (primary) • Improved energy security through reduced oil imports (marginal) • Improved air quality (marginal)	• Decreased fuel costs

Primary public good benefits

Avoided greenhouse gas emissions: Increased use of FETs in the light vehicle fleet results in the public benefit of avoided greenhouse gas emissions. Fuel efficient tyres use less force to roll a tyre forward, reducing the amount of fuel required to move the car. This rolling resistance affects vehicle fuel consumption which has a direct relationship with the amount of greenhouse gases emitted by a vehicle.

Other public good benefits

Improved energy security through reduced oil imports: Reduced fuel use reduces the amount of oil New Zealand is required to import which reduces the associated risks.

Improved air quality: Reduced tailpipe emissions improve local air quality.

Private good benefits

Decreased fuel costs: The increased capital cost of FETs can be more than offset by the fuel savings the FETs provide, resulting in overall cost savings to the driver.

3.3 Government failure

There is no indication the private sector plans to solve these failures and barriers without government intervention. The tyre industry is not well-coordinated and does not have an industry association. Government intervention may kick-start activity that the private sector could take over.

4 Intervention

4.1 Intervention logic

The intervention logic is supplied in Appendix One.

4.2 Investment objectives

The table below describes the objectives for the project. Note that it includes the objectives for the tyre pressure component of the project which is not covered by this report.

Table 2: *Investment objectives*

	Baseline	2014/15	2015/16	Lifetime
Total Sales (millions)	2.85	2.85	2.85	
% market share (business plan)	6%	9%	12%	
FET Sales	0.17	0.26	0.34	
Total Additional Cars on FET Tyres		20,800	40,000	
PJ petrol saved from tyre purchases		0.03	0.05	
PJ petrol saved from correct tyre pressure		0.02	0.04	
Total Savings PJ (FET & Tyre Pressure)		0.045	0.087	
Tonnes CO_2		3,000	6,000	38,000

The key investment objectives were:

- Increase the sales share of FETs by 3% percentage points (from a baseline of 6% to 9%) by the end of 2014/15.
- Increase the sales share of FETs by 3% percentage points (from a 9% to 12%) by the end of 2015/16.
- Save 0.03 PJ of fuel in 2014/15.
- Save 0.05 PJ of fuel in 2015/16.

4.3 Options

An options analysis was conducted in 2013 when the idea for the project was initially suggested[9].

Table 3: *Options analysis*

Option	Comment	Benefits	Costs	Ease of implementation
Do nothing	No change/business as usual. The market share of FETs increases slowly as rolling resistance of tyres improves due to technological improvements and minimum performance standards and labelling schemes overseas. Such tyres may also become available in New Zealand but the uptake of FETs can be expected to be lower than optimal. New Zealand may receive products that no longer meet minimum performance standards elsewhere offsetting improvements.	Low	Low	High
Minimum energy performance standards	Requires legislative enabler and long lead time, likely costly to implement but would exclude underperforming products; manufacturers unlikely to be supportive due to the need to test rolling resistance of all tyres. Australia not considering this approach	High	High	Low
Government	Requires objective means for comparison (e.g. label	Low/	Low	Medium

[9] 2013 Business Case.

procurement and guidance	or at least some information on the rolling resistance of tyres), but could increase demand for low rolling resistance tyres, and assist in affecting the supply of manufacturers	Medium		
Marketing	Marketing (advertising on web and television) can be effective in raising awareness, but it can also be costly. EECA has an existing programme that tyre marketing could build upon, but it would need to be linked with tyre labelling or rating, otherwise consumers would be unable to act upon their increased awareness.	Medium	High	Low
Tyre labelling (comprehensive, voluntary or mandatory)	Costly to implement and requires long lead time, manufacturers unlikely to be supportive due to costs to test all tyres, Australia considering a voluntary labelling scheme but progress slow and implementation uncertain	Medium	High	High
Tyre rating (product register or web tool)	Relies on information overseas, does not require additional testing by manufacturers, could be cost-effective if based on information available in other jurisdictions	Low/ Medium	Low	Low
Tyre labelling (voluntary)	May not require additional testing by manufacturers, or only for products that they feel should get the label	Low/ Medium	Low	Medium

4.4 Potential impact

The cost-benefit analysis from the beginning of the project calculated that if fuel efficient tyre sales increased from the baseline of 6% to 12% over two years then an additional 5.26 ktCO_2e would be avoided over business-as-usual in those two years[10].

This assumed that:

- Business-as-usual improvement in fuel efficient tyre sales is 5% annually
- FETs deliver 3% average fuel savings per vehicle

Once the project began and EECA was receiving sales data from programme partners it was found that in reality the baseline was 4.5% and there was no detectable business-as-usual increase in FET sales.

Check-testing of a sample of FETs and non-FETs revealed that the average difference in fuel efficiency between them was 2.8%[11].

The external evaluation[2] suggested that the size of the market for which FETs are economic is smaller than originally thought[12].

[10] Cost-benefit analysis available here.
[11] EECA check-testing analysis.

4.5 Market readiness

FETs are proven technology and readily available in the New Zealand market. They are often not more than $10-$25 more expensive than a standard tyre.

Mystery shopper analysis[13] proved the market is not very capable of upselling to FETs and the incentives in the supply chain are not strong enough to encourage more FET sales.

4.6 Risks of failure

If the project fails there is a risk that the industry loses faith in the Government and will be more sceptical of, and resistant to, any intervention in the future.

The register of current risks for the project follows.

Table 4: Risk register

Risk	Explanation	Probability	Impact	Mitigation
Reduced WOF frequency	There is a less frequent prompt to consumers for buying new tyres.	Unlikely	Moderate	The programme ultimately tries to encourage consumers to make more informed purchase decisions, and to be more proactive with regard to their tyre maintenance.
Check-test failures	Some manufacturers' tyre models fail check-tests and relevant tyres are removed from the programme. While this shows the programme is credible, if a reputable brand fails, then this could affect the programme negatively (e.g. the manufacturer could withdraw affecting programme coverage, other competitors could attack those that failed, and at the same time undermine the programme).	Possible	Major	Checks in place prior to registration, to ensure only qualifying product is registered. If a product fails, EECA will investigate the reasons for the fail (e.g. there may not be ill-intent) and carefully manage communications.

4.7 Interdependencies

There are no interdependencies with other programmes.

[12] 50% of the tyre market due to cash constraints, split incentives and lower benefits available to some due to circumstances.

[13] Mystery shopper results presentation.

4.8 Resource allocation

The project required 1.7 FTE for the first year, including design and development. This dropped to 0.7 FTE in year two, which consisted mostly of time from the Programme Manager and Relationship Manager, but also some in the area of compliance.

The budget was $2 million over two years.

The evaluation[2] at the beginning of 2016 resulted in down-scaling the project and the Business Plan for 2016/17 has allocated:

- 0.3 FTE for relationship management, administration and compliance activities.
- $30,000 for check-testing
- $15,000 for marketing

5 Performance

5.1 Effectiveness

In 2015, a mystery shopper exercise[13] was undertaken to better understand what is occurring at point-of-sale. Results showed that salespeople were generally not offering FETs unless prompted by the customer, were unable to provide key information about FETs and less than half had a positive view of FETs.

In late 2015, EECA commissioned an external evaluation[2] to conduct a market analysis, assess the intervention logic and make recommendations on the future of the project.

The project met expectations for tyre distributor participation but has not increased the sales of FETs and consequently has not had the desired impact.

The evaluations key findings were:

- Selling fuel efficient tyres is not a high priority for retailers. Some distributors are enthusiastic about selling FETs, but this only flows down to chain retailers with subsidiary relationships with certain distributors. This suggests that getting increased uptake of FETs would require enhancing the enthusiasm and support from retailers. Because retailers interact with the customer at the point of sale, retailers are best-placed to present a convincing argument for FETs.
- The benefits to consumers of purchasing FETs are smaller than originally estimated due to falling petrol prices and other factors. For the average light vehicle, over the estimated four year life of the tyre, the net benefit of FETs is $18.55 per tyre, and less for smaller-engine vehicles.
- About 50 per cent of the tyre market is extremely unlikely to consider FETs because the extra cost of FETs will benefit another party, for example, in the case of used car dealers. The most likely FET customers are some combination of: proactive, upper-income, environmentally conscious and owners of larger vehicles.

- Given that benefits and priorities are relatively low at every level of the supply chain, it is difficult to make an impact on the market. This means EECA's performance targets were overly optimistic.
- The prospect of doubling market share in less than two years was quite ambitious. In hindsight, assuming retailers promoted FETs, a more realistic target would have been 2 percentage points over six years. This would avoid the emission of 2,308 tCO_2e.

The evaluation recommendation was to scale down the marketing campaign, retain the label and maintain an internet presence.

5.2 Achieved benefits

Table 5: ***Achieved benefits***

Benefit	Beneficiary	Public or private goods	Value
Avoided greenhouse gas emissions (primary)	New Zealanders	Public	0 tCO_2e
Improved energy security through reduced oil imports (marginal)	New Zealanders	Public	Nil
Improved air quality (marginal)	New Zealanders	Public	Nil
Decreased fuel costs	Individuals/ households	Private	$0

5.3 Value-for-money

A complete cost-benefits analysis has not been completed because no measureable benefits have been observed. To date the project has cost $3.4 million of public money (EECA costs). There have been no costs to Programme Partners as it is assumed the marketing campaigns they ran would have happened anyway, but with different messaging. There are also no costs to light vehicle owners as no additional FET sales have been found to occur as a result of the project.

5.4 Programme future

EECA implemented the external evaluation recommendations. Investment in marketing has been reduced, but a small investment in maintenance of the label and compliance activities has been retained in order to maintain a presence in market.

The future project will incur much lower costs, while ensuring that the basic information barriers are being addressed, and enabling change to occur for the areas of the market that are 'ready' in the

future. Maintaining the labels and associated check testing regime preserves some of the sunk investment in the programme.

6 Lead organisation

EECA is the most appropriate government agency to run the project and has proven capability in similar types of interventions.

This project clearly fits within EECA's mandate under the *Energy Efficiency and Conservation Act 2000* to ''promote practices and technologies to further energy efficiency".

EECA has the capability to run this project as it has proven ability running a voluntary endorsement labelling scheme (for appliances - ENERGY STAR) and a labelling intervention within the transport sector (Vehicle Fuel Economy Labelling).

7 Conclusions

The tyre market is not structured in a way that enabled the project to be successful. While distributors were enthusiastic they did not prioritise FETs over non-FETs and did not have sufficient influence over tyre retailers. The project is not cost-effective without a significant shift in the activity of s 9(2)(b)(ii)

The problem definition and options analysis were too narrowly focused on one aspect of the light vehicle fleet which contributes to greenhouse gas emissions – in this instance, the low uptake of fuel efficient tyres. The structure and incentives in the industry mean that a voluntary labelling scheme was always going to struggle. Other intervention options may have been able to provide a better result and enabled the achievement of larger benefits.

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8 Recommendations

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9 Appendix One