

TOYOTA

Submission by
Toyota Motor Corporation Australia
to the
*Low Carbon Liquid Fuels (A Future
Made in Australia: Unlocking
Australia's LCLF opportunity)
Consultation Paper*

July 2024

Contents

Section	Page
Executive Summary	3
About Toyota Australia	4
Overview – Toyota’s approach to LCLFs	5
Views and responses to consultation questions	7
Conclusion	11

Executive Summary

Key points

- Toyota's global strategic direction is to decarbonise through a multi-pathway approach, that offers a breadth of low and zero-carbon technologies to allow customers to choose the right option for them, leaving nobody behind.
- Low Carbon Liquid Fuels (LCLFs) are a crucial part of this strategy and can accompany zero tailpipe emissions technologies such as battery electric vehicles (BEVs) and hydrogen fuel cell electric vehicles (FCEVs).
- Toyota Australia urges the Government to strongly consider the role LCLFs such as e-fuels, biofuels and biodiesel will also have for light vehicles as part of the Transport and Infrastructure Net Zero Consultation Roadmap. This Roadmap for light vehicles currently appears to be geared towards BEVs rather than the available breadth of low/zero emission technologies.
- Toyota Australia recommends that Australian standards for LCLFs are harmonised with international standards.

Toyota Motor Corporation Australia Limited (Toyota Australia) welcomes the Low Carbon Liquid Fuels (LCLF) consultation paper. Using LCLFs in the automotive industry aligns with Toyota's global long-term 'Toyota Environmental Challenge 2050', including an intention to reduce average greenhouse gas emissions from vehicles sold worldwide by over 50% by 2035 (from a 2019 baseline).¹ Globally, Toyota aims to minimise environmental impacts by focusing on issues such as water conservation, protecting biodiversity and promoting a circular economy with more recyclable vehicles. Toyota notes the important role that LCLFs such as next-generation advanced biofuels and e-fuels, as well as compressed hydrogen gas, can play in the development of lower carbon vehicles.

As part of this, Toyota believes that carbon reduction, rather than a particular technology, should be the focus. Toyota is committed to a multi-pathway approach, which focuses on developing a range of solutions and technologies that meet the diverse needs of our customers without leaving anyone behind. Toyota believes that LCLFs will form a crucial aspect of this strategy to enable our current and future customers to choose the low-carbon solutions that are right for them. They will be a key accompaniment to zero tailpipe emissions technologies such as BEVs and FCEVs, and may assist in reducing tailpipe emissions of internal combustion engines (ICE) and other low-tailpipe emissions technologies such as Hybrid Electric (HEV) and Plug-in-Hybrid Electric (PHEV).

¹2023 Toyota Australia Sustainability report p. 15, accessible at: [2023 Toyota Australia Sustainability Report](#)

Toyota’s response to the LCLF consultation paper provides our perspective on LCLFs at a broader level, and includes comments responding to the consultation questions. This response covers both the Toyota and Lexus brands in Australia.

About Toyota Australia

<p>Facts and Statistics</p>	<ul style="list-style-type: none"> ▪ Presence in Australia since 1959 ▪ 21 consecutive years as Australia’s best-selling automotive brand with 215,240 vehicles delivered in 2023. Additionally, Lexus Australia sold 15,192 vehicles in 2023. ▪ Toyota Australia directly employs 1,500+ staff ▪ Dealer network of approximately 280 Dealers with their own workforce of approximately 15,000 employees ▪ 200+ EV chargers across Toyota Dealers, including 16 that are publicly available. Toyota Australia has over 25 EV charging points across our corporate properties. ▪ While no longer a local manufacturer, Toyota Australia continues to deliver diverse operations above and beyond import/distribution as is evident through our Altona Centre of Excellence (COE). COE functions include: <ul style="list-style-type: none"> - Product Planning & Development, Conversions and Accessories – Design, develop or customise vehicles to meet the needs of the Australian market - Product knowledge centre – Carry out vehicle evaluation on a 1.2km test track purpose built to replicate Australian road conditions - Hydrogen Centre – Victoria’s first integrated hydrogen site including generation of hydrogen and refuelling station - Local assembly of Hydrogen Power Generators intended for both Australian and export markets. - Corporate Social Responsibility (CSR) initiatives - Sharing Toyota Production System knowledge with local industry through our Toyota Production System Support Centre (TSSC) and broader community support through Toyota Community Trust contributions (1% of pre-tax profit to community with a value between \$2.5-\$3.5 million per year). - Sponsorships and grass-roots community contributions such as the AFL ‘Good for Footy’ program, Cricket Australia, National Tree Day, Olympics and Tamworth Country Music Festival
<p>Product Information</p>	<ul style="list-style-type: none"> ▪ Market leader in hybrid technology <ul style="list-style-type: none"> - Introduced the first mass produced hybrid vehicle to the Australian market (Toyota Prius) in 2001 ▪ Pioneer in hydrogen fuel cell vehicle (FCEV) technology ▪ Toyota and Lexus hybrid and other zero and low emissions vehicle product range: <ul style="list-style-type: none"> - Toyota <ul style="list-style-type: none"> ○ Hybrids <ul style="list-style-type: none"> • Yaris • Corolla Sedan and Hatch • Camry • RAV4

- C-HR
- Yaris Cross
- Corolla Cross
- Kluger
- Hydrogen Fuel Cell Electric Vehicle
 - Mirai²
- Battery Electric Vehicle
 - bZ4X
- Lexus
 - Hybrids
 - LBX SUV
 - UX SUV
 - NX SUV
 - RX SUV
 - ES sedan
 - LS sedan
 - LC coupe
 - LM people mover
 - Battery Electric Vehicle
 - UX SUV
 - RZ SUV

Toyota launched its first hybrid in Australia in October 2001 with the original Prius, and has now sold more than 430,000 hybrid vehicles since then.

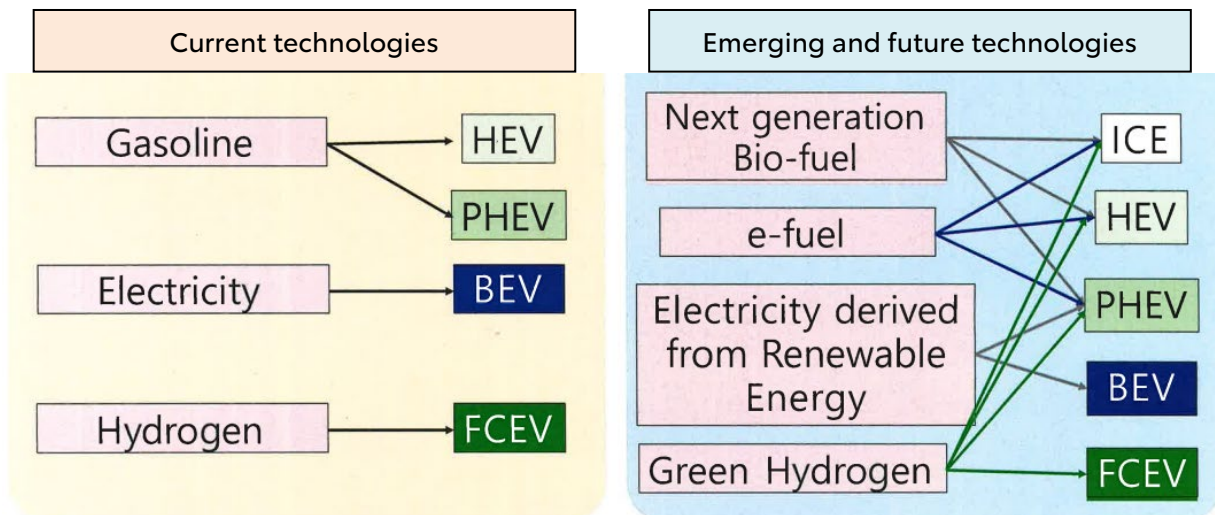
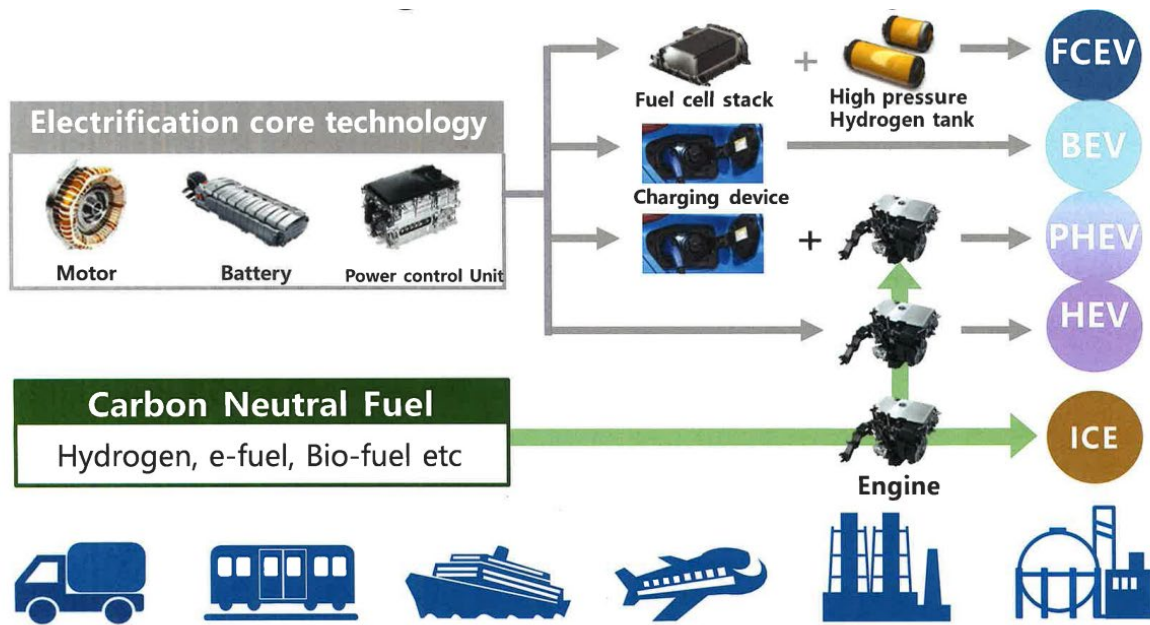
Overview – Toyota’s approach to LCLFs

Key points

- There is no single powertrain technology that is able to decarbonise the automotive industry while also meeting the differing needs and requirements of the Australian automotive market.
- LCLFs may play an important role as a retrofit option to help decarbonise the existing ICE-based light vehicle fleet (especially light commercial vehicles) and as an alternative solution for when BEVs are unsuitable.
- Toyota is currently trialling a hydrogen-fuelled ICE HiAce van suitable for back-to-base applications.

Toyota’s view is that LCLFs are a vital partner to other technologies to decarbonise the automotive sector, as part of a multi-pathway approach that leaves nobody behind. This is illustrated below:

²Available in limited numbers to select fleet customers only.



As evident in the images above, Toyota believes that a variety of technologies are required to help decarbonise the automotive industry through a multi-pathway approach. This ensures that we continue to deliver powertrains according to market needs and demand.

A particular technology may not meet the needs of every customer, and each technology has advantages and drawbacks. Toyota is confident that LCLFs such as e-fuels and bio-fuels (including biodiesel), as well as compressed hydrogen gas, will continue to play an important role in not only extending the life of the internal combustion engine (ICE) to a viable low-carbon option for customers for whom BEVs are unsuitable, but also to transition the existing light commercial vehicle fleet of ICE-equipped cars to a lower-carbon solution. Toyota notes that although market take-up of BEVs is accelerating, it will be a long-time before the technology achieves 100% market share, and therefore LCLFs and other technologies will continue to play a significant role.

As an example of this, Toyota has recently begun local trials and evaluation of a prototype HiAce van (commercial vehicle) powered by an ultra-low CO₂ emissions hydrogen-fuelled internal combustion engine, with pilot testing currently being undertaken by CPB Contractors. This vehicle is ideal for back-to-base operations and carrying heavy loads without suffering from the extended charging time (and consequent downtime) that equivalent BEVs may face. Toyota is exploring further improvements in the range and efficiency of hydrogen ICE technology by pairing it with our hybrid technology.



Toyota Australia suggests that LCLFs may also play a role to achieving carbon-neutral well-to-wheel emissions by 2050. Technologies such as carbon capture that are a key part of the process to produce e-fuels and other LCLFs may assist in offsetting already low LCLF CO₂ driving emissions, by capturing CO₂ during the LCLF production process.

As mentioned in the executive summary, Toyota strongly recommends that the Government put greater emphasis on LCLFs in the Net Zero Transport and Infrastructure Consultation Roadmap, due to the important role they will play in the automotive space going forward.

Views and responses to consultation questions

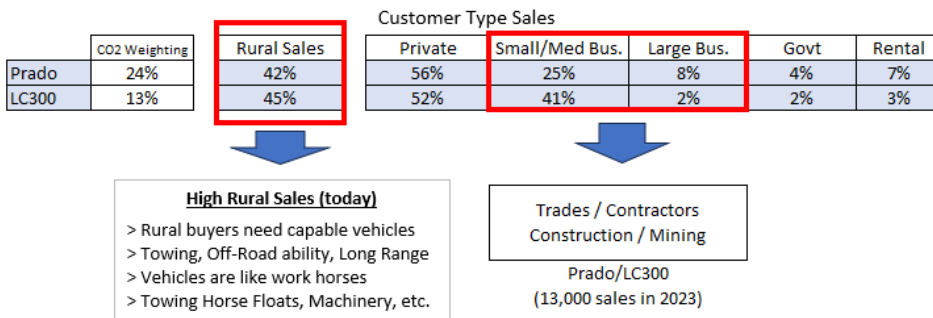
With respect to the consultation questions, Toyota would like to emphasise the following for each consultation topic:

Topic: The low carbon liquid fuels opportunity

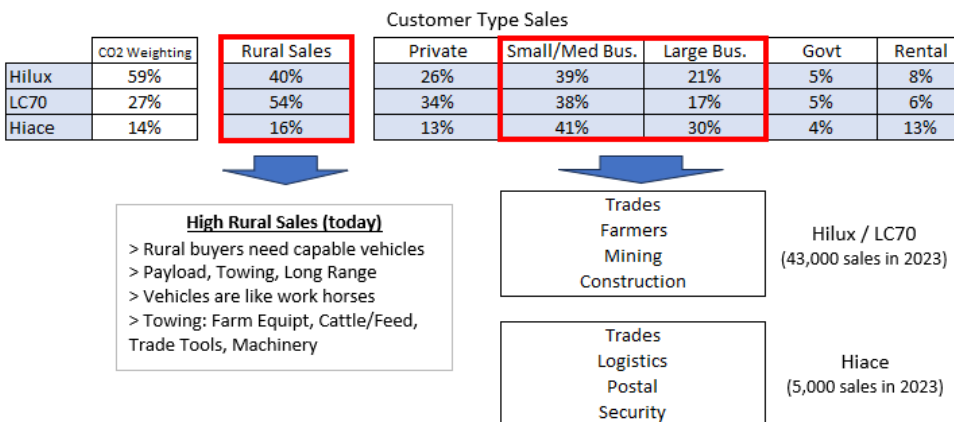
- Toyota notes that light and heavy commercial vehicles are more difficult to transition to BEV, with ongoing challenges such as charging time, weight and range when towing or carrying heavy loads.
- Toyota considers that LCLFs will remain an important part of the technology mix to help decarbonise these vehicle segments. Toyota therefore forecasts an increasing and ongoing mid-long term demand for biofuels.

- The demand for LCLFs may be increased by the need to decarbonise existing internal combustion engine (ICE) vehicles. Toyota notes that some light vehicles could have a lifespan exceeding 20 years, so new vehicles using an ICE engine purchased today may continue to be on the road past 2045.³
- Globally, Toyota’s research indicates that feedstocks such as sugar beet, wheat, corn, cassava and waste wood are all viable options to produce LCLFs. Toyota notes that the CO2 reduction of LCLFs compared to typical gasoline depends heavily on the producing area, raw materials and production method. For example, in Europe, biofuels produced using sugar beet as the feedstock have a significantly lower carbon intensity compared to wheat or corn.⁴

Large SUV (Body on Frame) Customers are Retail & Small Business in Rural Areas



LCV Customers are Small/Medium and Large Businesses in Rural Areas



As evident in the images above, a substantial portion of Toyota’s SUV and light commercial vehicle (LCV) customers live in rural areas, with many customers in the farming, mining and construction sectors. The capability requirements in these industries with regard to durability and performance in very harsh conditions, haulage and uptime may make LCLFs a more viable option to decarbonise compared to BEVs.

General comments on feedstock and supply chain

³Based on publicly available used car sales data. See, for example, vehicles produced in 2004 [and earlier on Carsales](#).

⁴Based on confidential research undertaken by Toyota Motor Corporation.

- Due to Australia's abundant natural resources, Australia may be more competitive internationally in procuring feedstock for biodiesel and hydrogen production.
- Toyota Australia suggests that building a supply chain is crucial for LCLF production. Comprehensive policies covering everything from feedstock procurement to stimulating demand are important. Toyota Australia notes that imports of LCLF may dominate if domestic production in Australia does not offer benefits in terms of carbon intensity and/or cost. Therefore, analysing and interpreting market data will be necessary.
- Toyota Australia suggests that building a supply chain is important for LCLF production. It is important to formulate and implement comprehensive policies from feedstock procurement to stimulating demand. If the domestic LCLF supply chain in Australia does not provide any benefits (carbon intensity and cost) to the supply and demand side, Toyota suspects imports will dominate. Analysis and interpretation based on market data is necessary.

Topic: Options to support an Australian domestic low carbon liquid fuel production

- Toyota Australia is not a producer of LCLFs, we are an offtaker. To this extent, we support a production incentive or credit scheme that equalises the pricing of LCLFs across different Australian jurisdictions.
 - For example, we would support a supply-side scheme that reduced pricing of B20 biodiesel and made it comparable across state jurisdictions. This would also ensure market confidence in LCLFs.
- Toyota anticipates that the introduction of a production incentive scheme would significantly increase supply (and reduce prices) for LCLFs in Australia, which in turn would encourage automotive OEMs to supply a greater volume of LCLF compatible vehicles.
- Toyota recommends that the Government consider programs to foster partnerships or consortiums between automotive OEMs, feedstock suppliers and energy companies to improve collaboration and introduce LCLFs into the market more rapidly.

Demand side signals

In addition to growing supply, demand side initiatives such as customer incentives (e.g. fleet incentives or tax benefits) and infrastructure investment may be necessary to help foster the uptake and utilisation of LCLFs. Toyota believes that adoption of LCLFs in the automotive sector will require sustained investment and infrastructure to achieve widespread adoption and substantial CO2 reduction.

Based on Toyota's long experience with ICE and hybrid vehicles, whole of life vehicle costs are important considerations. Toyota anticipates that LCLFs (with the right government support) will grow in popularity and demand, however the transition will take considerable time in the mass market and can only occur with the right focus on education, affordability, infrastructure and choice.

Toyota believes that demand side signals such as lower pricing, greater availability and customer incentives for LCLFs can further reduce the whole of life costs of LCLF-powered vehicles. It is preferable for LCLFs to specify the blend amount as "Blended fuel that partially replaces existing fuels" to the supplier side. This will allow more accurate estimates of demand for LCLFs, ensure its market supply, and ensure progress in reducing CO2 emissions are possible. Toyota supports the introduction of a fuel standard for LCLFs that is harmonised with international standards (e.g. EN 15940).

Toyota Australia notes that fuel prices may be high in the early stages of LCLF production. Therefore, it is preferable to design a system that takes into consideration early-stage measures on the demand side, such as tax benefits, and consider options that may initially keep the blend ratio small to prevent sudden price changes based on the LCLF blend ratio.

LCLF production incentives

- Regarding LCLF production incentives, in order to build a supply chain for LCLF manufacturing, Toyota suggests having several institutional designs for stakeholders including producers, procurement and retailers. For example, the following:
 - Stable procurement of feedstock (bioresource producers, farmers, H2 producers)
 - Support for conversion to fuels (technology and capital investment)
 - Ensuring demand (demand outlook based on policies such as tax incentives and LCLF mandates)
- Toyota suggests that these systems be designed according to the volume of CO2 reduction so that efforts to lower carbon can be accelerated.
- Toyota suggests that in order to make production in Australia competitive, it would be preferable to clarify demand and subsidy periods and provide conditions that make it easier for companies to enter the LCLF industry.
- Toyota suggests that other demand-side measures such as support under the New Vehicle Efficiency Standards (NVES) also be considered.

Incentives to produce sustainable aviation fuel (SAF) and renewable diesel

- Toyota notes that there may be differences in production incentive rates between SAF and renewable diesel, depending on demand.
- Toyota suggests that the Government look into determining the level of production incentives based on the amount of CO2 emissions produced during SAF and renewable diesel manufacturing, as a way to move towards carbon-neutrality.

Eligibility standards for fuel

- Toyota suggests that the eligibility criteria for fuel, as related to carbon intensity, could be gradually strengthened. Competition amongst fuel producers could be promoted by providing incentives when carbon intensity standards are met or exceeded.

LCLF mandates

- Toyota notes that mandating LCLFs will help in reducing CO2 emissions and accurately forecasting LCLF demand. However, Toyota suggests that the Government aim to strike the right balance between mandates and excessive regulation that could hinder widespread LCLF adoption.
- Toyota suggests that it is preferable that mandates or similar intervention measures ultimately be based on market data and analysis.

Conclusion

Aligned with our multi-pathway approach, Toyota strongly supports greater domestic production and further Government support mechanisms for LCLFs. Due to the various capabilities required in the commercial vehicle segment, and the nature of Australia's current ICE light vehicle fleet, Toyota expects that demand for LCLFs will increase and remain ongoing over the mid-long term.