The Diesel Transition: Petroleum diesel alternatives for the Australian agriculture, fisheries and forestry sector identifies the opportunities and practical steps to enable a shift from diesel machinery and equipment to alternatives, such as methane, battery and hydrogen fuel cell electric.

Background

Petroleum diesel fuel is the most widely used source of energy in the Australian agriculture sector, representing 84% of total energy consumption in 2020-2021. Its use is culturally ingrained as a practical, efficient fuel that can be stored for long periods on-farm as it is less volatile than petrol in hot weather. Diesel also often serves a range of practical purposes beyond use as fuel, for example as drilling fluid, for removing tree stumps or as a solvent.

The diesel dilemma

The sector is facing pressure to reduce its greenhouse gas (GHG) emissions while simultaneously facing supply risks, rising prices and price volatility for petroleum diesel fuels. While a focus on reducing emissions and switching to renewable energy sources is important in addressing climate change risk, there are also broader economic and fuel security issues driving the need for transition.

Australian governments are stimulating investment in alternative energy infrastructure, such as charging stations for electric vehicles and positioning hydrogen as a key component of Australia’s future energy landscape.

Machinery manufacturers have developed alternative fuel prototypes in hydrogen, biogas and battery electric, and are working to identify the market demand for new fuels, machinery and equipment.

It is therefore timely to understand the potential pathways for the sector to transition away from diesel.

Key findings

The agriculture, fisheries and forestry sectors across Australia are universally affected by the need to transition from fossil fuel-based diesel to alternative energy sources. The market is responding with developments in hydrogen fuel cells, battery electric and bioenergy equipment, and machinery. But demand in Australia is yet to be established.

Barriers to supply and demand:

- Upfront investment
- Investment case for early adopters
- Uncertainty in demand forecast
- Availability of regional skills and energy supply chain.
Supporting the transition

Transition from dependence on petroleum diesel fuels requires a coordinated and cross sector approach. This requires a parallel transformation of the supporting ecosystem of fuel and equipment supply chains, financial services providers, service networks and workforce skills. Australian agriculture industries working with governments, suppliers and training organisations must consider four areas of initial focus to plan for transition.

1. **Establish integrated planning and targets**
   Integration into existing strategic investment and planning, such as the National Hydrogen Roadmap and the work of RDCs, as well as incorporation into other sector-relevant industry roadmaps such as National Farmers’ Federation 2030 Roadmap.

2. **Establish a major pilots program involving manufacturers, supply chains and communities**
   Develop the governance, institutional (including local leadership capacity) and market engagement frameworks to initiate and support a national rollout of a major pilots program. E.g. geography-specific pilots that align with produce, machinery requirements, fuel supply chains, established infrastructure and coalescing of workforce and skills.

3. **Align incentives and regulation**
   Ensure sector perspectives are incorporated into national and state policies and frameworks for incentivising the adoption of new energy technologies and related skills. This includes reviewing, updating and/or building regulations and incentives (such as subsidies and tax incentives) to address distortions in existing incentives and stimulate supply and demand to promote uptake of technologies proven in the pilot program.

4. **Engage key supporting sectors**
   Work with the financial services sector to integrate the diesel transition into environmental, social and corporate governance (ESG) frameworks and incorporate into sustainability linked loan products for producers.

Today, early adopters in agriculture, fisheries and forestry, and other sectors such as road freight, are acting. Homegrown hybrid solutions are being trialled and professional retrofitting enterprises are serving the early adopter market. Investors are expecting a four to five-year transition period, followed by a rapid uptake of new energy technology in the sector.

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**About the Authors**

**Acclimate Partners** is an advisory, technology platform and capital management firm that supports climate and energy transitions in partnership with governments, communities and businesses. The firm enables a place-based approach to economic transformation, focusing on financial, environmental and social outcomes for all.

**The Australian Farm Institute** is an independent institute leading farm policy discussions for Australian agriculture. The institute ensures a viable future for the Australian agricultural community, delivers timely analysis and insights, and promotes evidence-based policy solutions that maximise the economic and social wellbeing of our farmers.