farmers for climate action

Energy Sovereignty for Regional Australia: Protecting Farmers, Powering the Future

A practical pathway to an energy-secure, productive and lower-cost regional Australia

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This policy roadmap is commissioned by Farmers for Climate Action, and is an independent, evidence-based report by the author.

About the Author

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Executive Summary

Australia's farmers and regional industries remain heavily exposed to a global diesel market they do not control. That exposure is now a material economic risk. Diesel price volatility, supply insecurity, tight margins and the rising cost of operating regional businesses all point to the same conclusion: Australia must accelerate the shift from imported fuel dependence to locally produced, lower-cost, more resilient energy systems. For regional Australia, the path forward is about fuel security, energy sovereignty and practical self-reliance. The same steps that cut exposure to fuel shocks, improve productivity and strengthen regional resilience also reduce emissions.

The core message of this policy roadmap is clear. Diesel dependence is a vulnerability; energy sovereignty is the opportunity. Agriculture should be supported to move beyond today's diesel use. Electrification is the future, and the time is now to create the enabling policy settings that let farmers seize it. That means protecting farm businesses while using tax, finance, procurement and regional infrastructure policy to accelerate electrification and sustainable biofuels where they are practical, commercially rational and strategically valuable.[1]

The policy logic

This policy roadmap is built around four linked propositions:

1. **The current fuel system leaves agriculture exposed.**
   Australia's farming and regional industries remain heavily dependent on imported diesel and highly vulnerable to fuel price shocks and supply disruptions.
2. **The shift to cheaper, cleaner and more locally produced energy is already underway.**
   Across regional Australia, fixed electrification, on-farm solar, batteries, electric pumps, light vehicles and smarter energy management are already reducing operating costs and improving resilience.
3. **Government policy can accelerate the technology 'flywheel'.**
   Well-designed policy can lower risk, speed commercialisation, strengthen supply chains and make the next round of adoption easier and cheaper.
4. **Farm businesses must not carry disproportionate risk.**
   The shift should be shaped so farmers gain access to cheaper and better options over time, rather than being left to absorb the highest costs and uncertainty.

Recommendations

1. **Protect farms while accelerating change.**
   Reform fuel tax settings while protecting farm businesses and associated industries. The Australian Government should reform the Fuel Tax Credits Scheme (FTCS) to reduce long-term dependence on imported diesel, while explicitly protecting farm businesses and directly related agricultural industries. This requires a clear commitment in the Budget and accompanying policy statements that any changes to FTCS will shield agriculture and associated industries from negative consequences.

2. **Legislate a cap on very large FTCS claims and recycle savings into the transition.**
   The Parliament should amend fuel tax legislation to cap FTCS claims at $50 million per claimant per year (Climate Energy Finance proposed "Transition Tax Incentive"). The Government should earmark a significant portion of the savings for a dedicated regional energy shift program that helps farmers adopt best-fit biofuels, electrification and enabling infrastructure.

3. **Create a Regional Energy Upgrade Incentive for productive assets.**
   The Australian Government should strengthen time-limited tax or grant-based incentives specifically for productive diesel-substituting assets on farms and in regional businesses. This should cover equipment, charging, storage, renewable-fuel capability and related infrastructure, with program guidelines that prioritise technologies and business models designed to scale into agriculture and regional industries (not just city-based SMEs).

4. **Align fuel-security and cleaner-fuels spending with regional electrification.**
   When allocating new funding for fuel security and cleaner fuels (such as budget measures for strategic reserves, cleaner fuels programs or hydrogen/OFE initiatives), the Government should require that a defined share supports regional electrification, storage and local energy systems. This can be done through funding criteria that favour projects which both improve short-term fuel resilience and reduce diesel use over time including clear national fuel standards and consumer protections so that, where biofuels meet agreed specifications, machinery warranties and regulations support their use in agriculture.

5. **Direct public finance institutions to prioritise regionally relevant technologies.**
   The Government should update the investment mandates and guidance for the Regional Investment Corporation (RIC), National Reconstruction Fund (NRF), Clean Energy Finance Corporation (CEFC) and ARENA so they explicitly prioritise:
   - regionally relevant electrification, storage, charging and ag-tech, and
   - renewable fuel solutions suitable for Australian agricultural conditions.

   This can be delivered through revised Statements of Expectations and specific regional/agriculture investment targets within existing funds.

6. **Support best-fit technologies on farms through targeted programs.**
   Relevant departments (Agriculture, Climate/Energy, Infrastructure) should expand or create programs that support:
   - rapid deployment of electric pumps, irrigation, refrigeration, processing equipment, light vehicles and emerging electric machinery where commercially attractive; and
   - sustainable biofuels for hard-to-electrify and transitional uses, particularly as a bridge for existing lower-use machinery.

   Program design should make clear that electrification is preferred where it is cheaper and more practical, while biofuels are targeted to specific roles.

7. **Fund regional enabling infrastructure for energy-sovereign communities.**
   The Australian Government, working with states and network businesses, should invest in rural network upgrades, storage, charging hubs, microgrids, local generation and regional service capability. This should be done through dedicated regional infrastructure programs and updated network planning processes that recognise regional electrification and energy sovereignty as explicit objectives, not afterthoughts.

8. **Modernise tax and regulatory treatment of diversified farm businesses.**
   Treasury, the ATO and relevant regulators should review and clarify tax and regulatory settings so that:
   - income from integrated energy generation, storage, hosting and verified environmental services can be treated as part of a genuine farm business where it supports core production and resilience; and
   - larger agribusinesses face clear and consistent rules that support participation without loopholes.

   This is likely to require updated ATO guidance and, where necessary, targeted amendments to primary production provisions rather than a full rewrite of tax law.

9. **Fund demonstrations, training and open performance data.**
   The Australian Government should co-fund a structured program of demonstration farms, machinery trials, side-by-side comparisons (diesel vs biofuels vs electric), regional training pathways and open performance data. This program should be delivered with industry partners and state agencies, focus on major farming systems (broadacre, dairy, horticulture, grazing, regional processing), and require that results are made publicly available to inform farmer decision-making. Existing models, including the Producer Demonstration Sites being developed by the Zero Net Emissions Ag CRC should be explored[2].

Energy Sovereignty - How we get there

This policy roadmap follows four linked propositions. Together, they describe why fuel dependence is now a strategic risk for agriculture and what government and industry can do about it.

1) **The current fuel system leaves agriculture exposed.**
   Australian farming and regional industries are highly diesel-dependent. Diesel supplies most on-farm energy use in stationary generation (fixed and mobile), and across planting, harvesting, pumping, freight, processing and mobile operations. In 2026, that dependence exposed farmers to supply-chain disruption and international price shocks, pushing diesel well beyond $3 per litre in many regions and locking many farms into a higher-cost, import-dependent energy structure than they will need in future.[3,4,5]

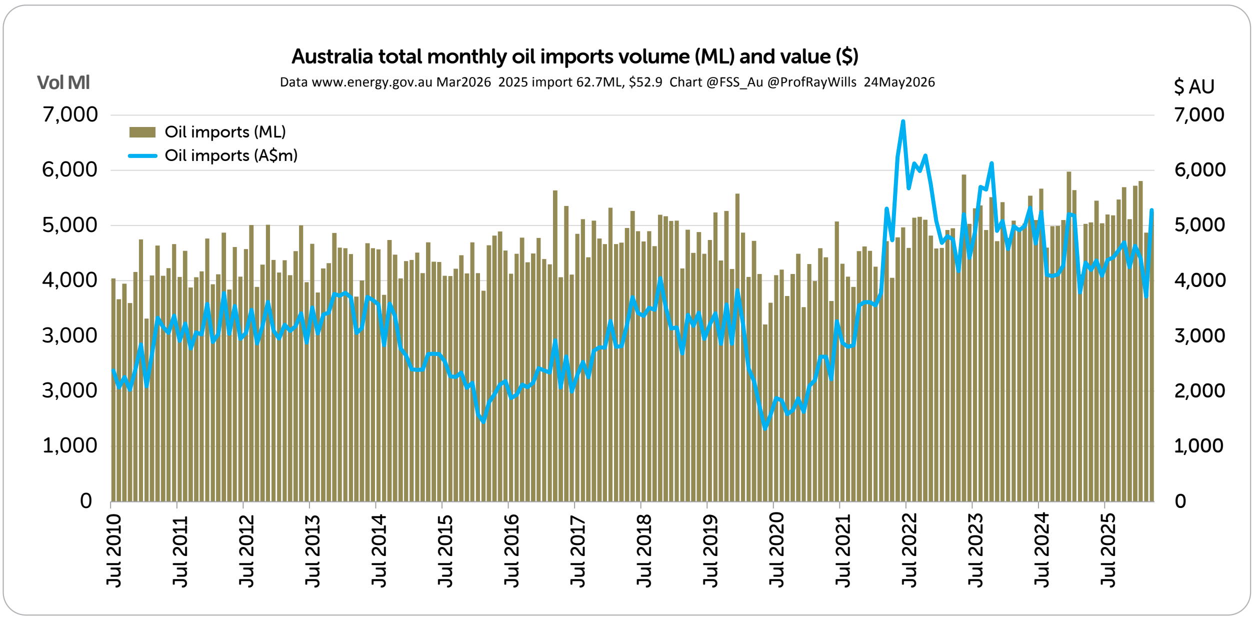


Figure: The 2026 oil crisis has exposed how vulnerable regional Australia remains to a global energy system it does not control – though pricing during the 2022 invasion of Ukraine sent prices much higher. The behaviour of previous oil spikes from past crises suggests current higher prices will likely last for several more years.

2) **The shift to cheaper, cleaner, more locally produced energy is already underway**
   Across agriculture and related industries, technology is improving in electric drivetrains, batteries, charging systems, smart load management, solar-powered fixed operations, energy storage and integrated on-farm energy systems. In regional towns and on larger sites, microgrids and local generation are beginning to demonstrate more reliable supply at lower running cost. The question is no longer whether electrification will play a role, but how policy can support accelerated adoption as an essential pillar of industry resilience and energy security.[6,7]

3) **Farm businesses and regional businesses should not carry disproportionate risks.**
   As energy use shifts to cheaper and cleaner sources, farms and regional businesses need access to finance, infrastructure, demonstration projects, standards, workforce development, tax clarity and regionally relevant supply chains so that lower-emissions choices are also the commercially rational choices. For larger operations, this should be less challenging. Overall, agriculture needs tailored enabling policy that lowers risk and makes the next investment decision easier, not harder.[8,9]

4) **Government policy can accelerate the 'flywheel'.**
Well-designed policy can turn early adoption into a flywheel that lowers costs and expands choice over time. A logical mechanism to facilitate this already exists: capping Fuel Tax Credits Scheme (FTCS) claims for the largest recipients. A cap, if paired with a well-designed Regional Energy Upgrade Incentive and existing public-finance tools, can help large users move first into cleaner technologies and systems.[10] Rather than inventing entirely new instruments, policy can strengthen and redirect existing institutions – including the National Reconstruction Fund (NRF), Regional Investment Corporation (RIC), Clean Energy Finance Corporation (CEFC), ARENA and others – so they speed commercialisation, bring down costs, strengthen supply chains and support technologies designed for transfer into agriculture and regional industry.[11,12]

These propositions point to electrification as the main long-term pathway for reducing diesel dependence and improving energy sovereignty in agriculture, supported by targeted use of sustainable biofuels in specific roles.

Marcus James, **Carrick, TAS**

Marcus James is a Tasmanian farmer and agricultural adoption adviser. Marcus has led the transition to solar-powered irrigation and is now developing a solar and battery project that combines data-driven irrigation, energy storage and smart energy management.

"Energy sovereignty gives farmers more control over the cost of their own energy. Farmers want access to fuel and energy that reduces our costs and keeps more economic value in rural Australia."

Why electrification is key

Electrification represents the single greatest opportunity to structurally lower costs and improve energy sovereignty in the modern history of Australian farming.[13]

An electrified system converts energy into useful work far more efficiently than combustion-based alternatives, particularly when paired with on-farm regional renewable generation.[14,15,16] That matters because farmers are not just choosing between technologies for the next few years; they are choosing between competing cost structures and system vulnerabilities for the coming decades.

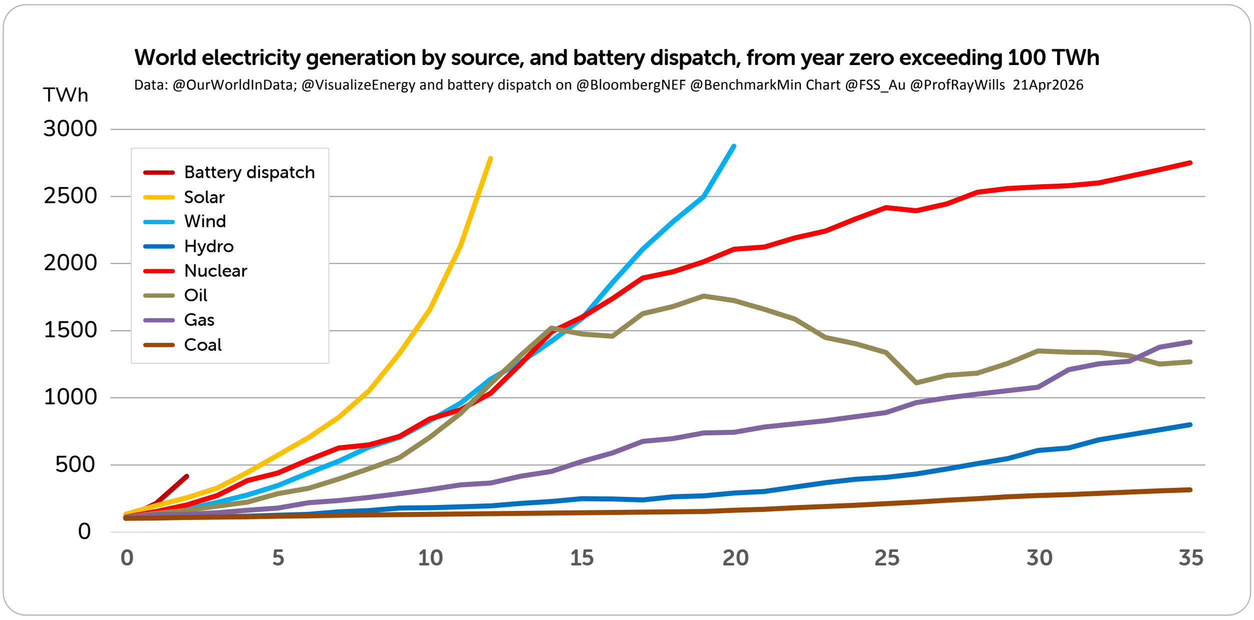


Figure: The growth of solar and battery storage is the fastest energy shift in human history.[17]

In practical terms, it is easier to electrify the stationary and short-range jobs first than the biggest mobile machines. Many of the largest early opportunities in regional Australia are in fixed and semi-fixed systems already well suited to electrification: irrigation and water pumping, cold storage and refrigeration, sheds and workshops, processing equipment, on-farm utilities, and charging of light and medium vehicles. As these uses electrify, they reduce diesel demand while building the skills, service capacity and confidence needed for more complex changes.[18,19]

Over time, this can be followed by the progressive electrification of more mobile plant as products mature and become increasing reliable and affordable. Light vehicles, materials-handling equipment and smaller machinery are moving first, with heavier machinery and longer-haul freight expected to become mainstream in leading markets around the early 2030s, with spill-overs into Australian markets as products and service networks develop. Policy should be designed so that wherever electrification is practical it becomes easier, cheaper and more attractive to adopt, while harder applications are supported through transitional solutions rather than used as a reason to delay the broader shift.

Electrification is also the most direct route to energy security. It allows farms and regional communities to turn local renewable resources into low-cost, productive energy, rather than remaining dependent on imported liquid fuels.[20] Solar-powered electric equipment can displace diesel (and biofuels) while cutting operating costs and reducing exposure to volatile global fuel markets. On suitable land, the useful transport energy from solar can far exceed what can be produced from biofuel crops over the same footprint. The real task is to choose cost structures for the rest of this century, not to maintain long term dependence on diesel..

Each successful deployment builds confidence, creates skills and reduces the risk for the next adopter. That is where a "flywheel" begins: early projects, often supported by public policy, help make electrification and other better options more available and more attractive for the next wave of farms and regional businesses.

The following sections explain how policy can turn this direction of travel into a practical flywheel, and how, in practice, the shift can unfold across stationary loads, mobile plant and regional energy systems over time.

Heavy transport is already showing the direction of travel

This shift is no longer theoretical. Electric heavy transport is already operating in Australian conditions, including freight and mining applications.

In 2026, megawatt-class charging systems and battery-swap systems are already being used in heavy vehicles, enabling long duty cycles with fast turnaround.[21,22] Janus Electric, New Energy Transport and Linfox have already demonstrated electric freight operations[23], while Fortescue has committed to large-scale battery-electric haulage in the Pilbara.[24] Early operating experience suggests that where low-cost electricity is available, electric heavy vehicles can deliver materially lower running costs than diesel. Early Australian data from electric prime movers shows fuel vs electricity cost savings of around 70–80% on key freight routes when trucks run on low-cost electricity instead of diesel. Overall operating costs for electrified heavy fleets are projected to be up to 20% lower than diesel once fuel, maintenance and productivity are taken into account[25,26] along with maintenance and performance advantages in some operating conditions.[27,28]

If electrification is already proving commercially and operationally credible in other sectors, it strengthens the case that many agricultural energy uses — especially stationary loads, light vehicles and progressively some mobile machinery — can also shift as products and support systems mature. That matters because heavy freight and haulage are among the most demanding transport tasks in the economy.

That does not mean every tractor, harvester or heavy vehicle will be electrified tomorrow. It means policy should be designed so that, wherever electrification is practical, it becomes easier, cheaper and more attractive to adopt. Meanwhile, the harder applications are supported through transitional solutions rather than used as a reason to delay the broader shift.[29]

Global signals: what's coming from other markets

Experience in other markets points in the same direction. In China, electric heavy trucks are already being deployed at scale along freight corridors, supported by battery-swap networks and megawatt-class fast charging, with plans for nationwide swap infrastructure and very high penetration in heavy freight this decade.[30,31,32,33] Chinese manufacturers are also developing electric and autonomous tractors, some of which are now being tested for potential entry into Western markets. On current trajectories, electric options in heavy machinery and tractors are likely to become mainstream in leading markets around the early 2030s. Rapid spillovers into Australia is likely as products, standards and service capability mater. Ensuring those products meet Australian operating conditions will require substantive Australian input into design and capability development.[34]

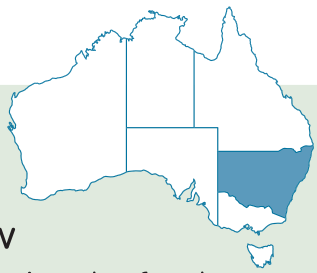
Case Study: Seeding Cost Comparison

Energy needed for a 6,000 ha farm seeding operation

A broadacre seeding program of around 6,000 hectares over 35 days might currently use about 30,000 litres of diesel, equal to roughly 320 MWh of fuel energy. If the same work were done with an efficient electric tractor, the electricity required could fall to around 110 MWh because electric drivetrains convert much more of their energy into useful work. That is about 3.1 MWh a day over the seeding period.

In indicative terms, that daily electricity demand could be supplied around 600–900 kW of solar PV, using 1–1.5 hectares of panels, together with about 2.5 MWh of battery storage. This is not a blueprint for every farm. It is an illustration of how a large recurring fuel bill can, over time, be replaced by productive on-farm energy infrastructure that also supports pumps, sheds, workshops or trucks beyond seeding.

Metric	Diesel	Electric
Farm area	6,000 ha	6,000 ha
Seeding period	35 days	35 days
Energy input	30,000 L diesel About 320 MWh fuel	About 110 MWh electricity
Daily energy	About 9.1 MWh/day fuel input	3.1 MWh/day electricity
Indicative energy cost	A$48k–60k at A$1.60–2.00/L	About A$12.3k at A$0.125/kWh
Core assets	Diesel supply, storage, engine service	600–900 kW PV (1–1.5 ha) + ~2.5 MWh battery
Strategic value	High and volatile fuel-price exposure	Shared on-farm power for pumps, sheds, trucks



Martin Murray, Bendemeer, NSW

Martin is fourth generation farmer operating a beef cattle property with his with his wife, Rachel, near Bendemeer in the New England. Martin was previously chair of NSW Farmers Young Farmer Council and a member of the NFF Young Farmer Council.

"We are an extremely fuel insecure nation. To remain an agricultural powerhouse we need to invest in other systems and technologies that allow us to reduce our dependence on imported fuel."

The role of biofuels

The AgriFutures Australian Agriculture, Fisheries and Forestry Sector Energy Transition Roadmap points to a mixed energy future for agriculture, with liquid fuels — including biofuels — likely to remain important in some heavy machinery, transport, forestry and fishing applications. That is a realistic starting point, especially for existing machinery fleets and for duty cycles where electric alternatives are still emerging.[35]

For farmers, the most immediate value of sustainable biofuels is practical. They can reduce reliance on fossil diesel in legacy machines and help keep regional production moving while electric options mature. For many smaller and lower-use farms, good access to sustainable biofuels may be one of the most cost-effective ways to cut fossil diesel use in the remainder of this decade while continuing to use tractors and equipment already on hand. Their strongest roles are in hard-to-electrify and transitional applications: heavy machinery in some operating conditions, remote operations, forestry, fisheries and particular freight tasks, as well as hard-to-abate sectors such as aviation.

Recent industry commentary suggests that with clearer policy signals, private investors could bring several billion dollars of capital into new biofuel plants without major additional public spending.[36] That would be welcome, but it is still modest alongside estimates that building domestic biofuels production to a truly national scale would require investment on the order of tens of billions of dollars in plant alone. Biofuels are therefore best understood as an important niche and transitional solution, not a complete substitute for structural electrification of land-based energy use.

The Federal Government has also announced a $1.1 billion Cleaner Fuels Program over 10 years to stimulate domestic production of low-carbon liquid fuels, including renewable diesel and sustainable aviation fuel.[37] That commitment is important as part of a broader fuel-security strategy, but at around $110 million a year it is far too small, by itself, to deliver the very large scale of biofuel production that would be required to replace a significant share of Australia's liquid fuel use. [38]

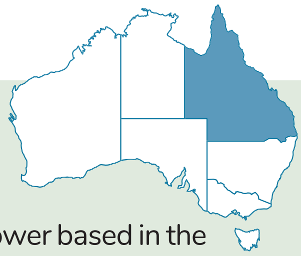
When capital replacement is taken into account, modelling indicates that a new battery-electric tractor beats an already-owned diesel tractor running on suitable biofuel only above relatively high annual utilisation (in the order of 1,300 or more engine hours a year, typical of large broadacre operations).[39] For many smaller farm operations with lower annual hours, continuing to use existing tractors on sustainable biofuels may be the cheaper near-term option, with the next generation of machinery gaining the benefit of continuously falling battery costs. Used this way, biofuels can bridge the gap for current fleets while electrification is prioritised where it already offers better long-term outcomes.[40]

There is also an inherent trade-off, because land and biomass used for biofuel feedstocks are not available for food and fibre production, so large-scale biofuel expansion must be weighed against its impact on agricultural output.

At the same time, global heavy industry leaders are increasingly treating green hydrogen-based synthetic fuels (e-fuels) as the long-term solution for sectors like aviation and shipping, with biofuels playing an important stepping-stone role.[41,42,43] For agriculture, the strategic question remains the same: which technologies offer the best combination of cost, reliability, productivity and energy security over the life of the asset? Where electrification is available, the evidence shows it offers very strong long-term economics, better use of local renewable resources and a more direct path to reducing exposure to imported fuels.[44, 45]

In practice, there are still barriers to wider on-farm uptake of biofuels, including concerns about fuel standards, engine compatibility and the impact on warranties. These issues point to the need for clear, trusted standards and consumer protections so that, where sustainable biofuels are genuinely suitable, warranties and regulatory settings do not become unnecessary obstacles to their use.

For that reason, biofuels belong in this policy roadmap as an important supporting element, especially in hard-to-electrify and transitional applications, alongside a strong focus on electrification wherever it offers better long-term outcomes. Over the longer term, falling renewable electricity costs mean that most land-based agricultural energy is best supplied via electrification, with liquid fuels kept for the genuinely hard-to-electrify uses where no practical electric alternative yet exists. Biofuels should not be dismissed, but nor should they be overstated. Their most valuable place is in targeted uses where electric options are not yet practical, and in helping bridge the shift for existing machinery, while policy and investment continue to accelerate electrification wherever electrification can deliver lower long-term cost and higher energy productivity.



Renée Anderson, **Emerald, QLD**

Renée is an irrigated cotton and grain grower based in the Central Highlands of Central Queensland. She represents growers nationally on the GrainGrowers Ltd National Policy Group, the National Farmers' Federation Workforce Panel, and the Australian Cotton Industry Sustainability Reference Group.

"It's unfair that family farms face massive upfront costs just to reduce their vulnerability to global events. The playing field needs to be levelled."

Image: Credit Ben Harden

Where biofuels fit on farm

Sustainable biofuels are not a full alternative to electrification, but they do have clear on-farm roles, especially in the 2020s and early 2030s:

Existing tractors and harvesters with moderate hours.
Lower-use broadacre and mixed farms can cut fossil diesel use in current machines by switching to suitable biofuels, avoiding premature capital replacement while electric options mature.

Heavy machinery in demanding duty cycles.
Bulldozers, loaders and other high-power equipment working long days, steep terrain or remote sites can use biofuels where electric options are not yet practical.

Remote and off-grid operations.
Where grid access is limited and on-site solar and storage cannot yet cover all needs, biofuels can support generators and mobile plant while longer-term electrification and local energy systems are built.

Specialised sectors such as forestry and fisheries.
Harvesters, skidders, vessels and other specialised equipment that will remain liquid-fuelled for longer can use biofuels to reduce exposure to fossil diesel and diversify supply.

Bridging for smaller farm businesses.
For many small and mid-sized farms, biofuels can be a practical bridge: cutting fossil diesel use in existing machinery now, while electrification is prioritised where it is already cheaper and for the next generation of equipment.

Used this way, biofuels sit alongside electrification: targeted to the hard-to-electrify and transitional uses where they add the most value, rather than competing with electrification as the main long-term pathway for land-based farm energy.

Building the 'Flywheel'

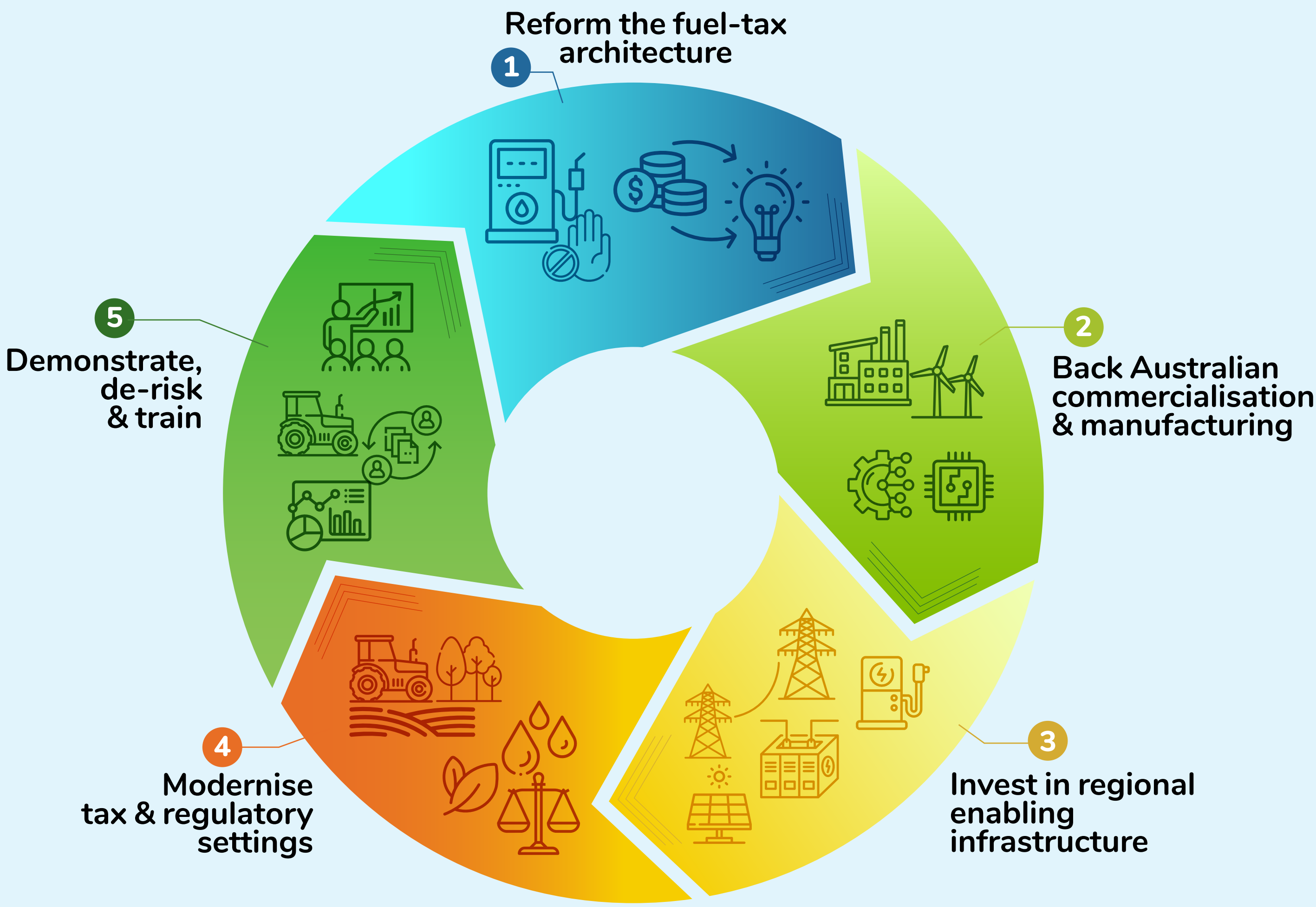
The key challenge in this shift is policy design. It is policy design: moving from a linear mindset, where one intervention produces one isolated outcome, to a compounding mindset, where each step lowers cost, builds confidence, strengthens supply chains and makes the next step easier. That is the practical meaning of the flywheel in this policy roadmap: using policy so that early adoption leads to lower costs, wider availability and stronger regional capability over time, rather than one-off projects that do not spread.[46]

This matters because the four propositions set out earlier are connected: Agriculture is exposed because it remains tied to imported diesel; the shift to cheaper and more locally produced energy is already underway; farm businesses should not be left to carry the highest risks; and government has tools that can speed up the transition if they are used in a coordinated way. The task is not to invent a whole new policy architecture, but to align existing finance, tax and industry institutions around those four propositions.[47,48]

In practical terms, the flywheel works through the following reinforcing moves: Fuel-tax settings and a Regional Energy Upgrade Incentive help large fuel users and better-resourced operators move first into electrification and cleaner fuels, proving out equipment and business models. Public finance institutions such as the RIC, NRF, CEFC and ARENA then support commercialisation, manufacturing and deployment, so that products and services designed for mining, freight and heavy industry can be adapted for agricultural use. Network and regional infrastructure investment makes electrification and alternative fuels practical in the places farmers actually operate, rather than only in cities and large industrial zones. Demonstrations, trials and training reduce perceived risk for producers and build the skills and service capacity needed for wider adoption.[49,50]

Farmers and regional businesses also have a role in shaping the flywheel from the demand side. Over time, clearly signalling that new machinery and equipment should support electrification where practical will help give manufacturers and dealers the confidence to invest in the products regional Australia will actually need.

The Policy Flywheel – where each step lowers cost, builds confidence, strengthens supply chains and accelerates the future.



1 Reform the fuel-tax architecture

What it does

Australia's fuel tax credit system has become a large subsidy for diesel use, with its biggest benefits now flowing to very large fuel users such as mining rather than to farm businesses. The scheme in its current form no longer fits the energy and industry shift now underway. Reform should therefore focus on capping very large claims while protecting genuine farm businesses, and redirecting part of that support toward the equipment, infrastructure and commercialisation needed to reduce long-term dependence on imported diesel.[51]

How it spins the flywheel

Fuel-tax reform is about using the tax system to accelerate the flywheel.[52] Large fuel users such as Fortescue have highlighted that the current fuel tax credit scheme weakens the financial case for cleaner technologies by delaying investment in electrification and other low-emissions alternatives.[53] Capping very large FTCS claims and recycling some of the savings into a Regional Energy Upgrade Incentive and related programs creates budget headroom and clear price signals that encourage the largest fuel users to move first into electrification and cleaner fuels. As those large users invest, they help prove out technologies, bring down costs, strengthen supply chains and create operating experience that smaller farm businesses can adopt later with lower risk.[54]

2 Back Australian commercialisation, manufacturing and deployment

What it does

Australia should use existing public finance institutions — especially the Regional Investment Corporation, the National Reconstruction Fund, the Clean Energy Finance Corporation, ARENA and related bodies — to accelerate the commercialisation, manufacturing and deployment of technologies that can lower farm energy costs and strengthen regional energy sovereignty. Priority areas include farm machinery, power electronics, charging systems, batteries, electric drivetrains, smart energy management, modular retrofit systems and regionally suitable renewable-fuel technologies.

How it spins the flywheel

By backing commercialisation and manufacturing, policy turns early demand into durable capability. When RIC, NRF, CEFC and ARENA support the first wave of projects and products, they help move promising technologies from pilots into mainstream markets, reduce unit costs through learning and scale, and build local service networks. That makes it more likely that equipment and systems are designed for Australian regional conditions, and it means each subsequent farmer or regional business faces lower costs, better products and more reliable support when they choose to electrify or adopt new fuel systems.

Build in Australia

A **Build in Australia** approach that backs domestic manufacturing and commercialisation can strengthen sovereign capability, improve regional employment, build supply-chain resilience and create export opportunities in technologies suited to harsh, remote and variable operating conditions. Just as importantly, it increases the chance that equipment used in Australian agriculture is designed for Australian realities rather than imported later as an imperfect fit. Recent growth in Australian-made battery and electrification manufacturers — as described earlier from heavy-vehicle conversions like Janus Electric to modular battery and storage firms serving regional projects — shows how local capability can develop around these opportunities when policy and finance are aligned.[55,56]

Public finance should therefore be used strategically across the commercialisation chain. RIC can help eligible farm businesses with concessional finance and resilience investment[57]; NRF can back manufacturing capability in renewables and low-emissions technologies[58]; and CEFC can help scale lower-emissions agriculture and on-farm energy improvements through investment and discounted finance.[59] Used well, these institutions can help move promising technologies from pilot stage to commercial deployment, especially where products first proven in mining, freight or heavy industry can be adapted for agricultural use.

Done well, this creates spillovers that matter to farmers: lower costs, better service networks, stronger local capability and more practical choices over time. This links energy sovereignty not just to supply of energy, but to regional capability in the equipment, finance and systems that make lower-cost energy usable in practice.[60]

3 Invest in regional enabling infrastructure

What it does

No serious shift to a better energy system will occur if farms are asked to adopt biofuels or electrify without the infrastructure needed to make those options work in practice. The regional energy shift is not only about the vehicle, machine or fuel; it is about the surrounding system that determines whether a lower-cost alternative is reliable, available and commercially attractive. That system includes rural network upgrades, stronger local distribution, community-scale storage, microgrids, charging infrastructure, standards, service capability and digital integration.[61,62]

How it spins the flywheel

Investing in regional enabling infrastructure removes the practical barriers that otherwise stall adoption. When irrigation districts, cold chains, local freight interfaces and farm energy systems gain access to stronger networks, storage and charging, early electrification projects are more likely to succeed and to be visibly useful in everyday operations. Those early wins build confidence among producers, financiers and suppliers, and they create the conditions in which each new electrified pump, refrigeration system, vehicle or machine is cheaper and easier to connect than the last.

Rural network upgrades, stronger local distribution, community-scale storage, microgrids, charging infrastructure, standards, service capability and digital integration are all part of the productive platform for lower-cost regional energy. These are not secondary issues. They are the enabling conditions that allow electrification and alternative fuels to move from technical possibility to everyday business practice, especially in regions currently dependent on diesel generation or weak grid connections.

Investment should focus first on high-value, high-readiness uses, particularly irrigation, processing, cold chain, local freight interfaces and farm business energy systems where lower-cost electricity can displace expensive diesel quickly. Visible early wins matter because they show that the shift is about practical business improvement, and because they build the confidence, skills and service networks that make subsequent adoption easier.[63]

4 Modernise tax and regulatory settings for diversified farms

What it does

The farm business of the future is likely to combine food and fibre production with energy generation, storage, service income and environmental stewardship. Policy settings should recognise that this is the emergence of a more resilient and productive primary enterprise. Tax and regulatory rules should therefore be updated so that generation, storage, hosting, flexibility services and verified environmental income, when integrated with a genuine farm business, are not treated as anomalous to primary production. Where those activities strengthen the viability of the farm enterprise, policy should make participation easier, not harder, while applying clear and consistent rules to larger agribusinesses.[64,65] Removing these frictions will improve bankability, support investment decisions and help farms participate more fully in the regional energy system. It will also make it easier for producers to diversify income, strengthen resilience and capture more of the value created by the energy shift, without undermining agricultural production or creating unnecessary tax complexity.

How it spins the flywheel

Modern tax and regulatory settings make it easier for farms to invest in and host the assets that underpin energy sovereignty. Clear treatment of integrated energy and environmental income improves bankability, supports investment decisions and allows farms to participate more fully in local energy systems and natural-capital markets. As more businesses are able to add storage, generation, hosting or environmental services without tax penalties or uncertainty, the regional energy system gains more participants and more capacity, further reducing costs and risks for the next wave of adopters.

5 Demonstrate, de-risk and train

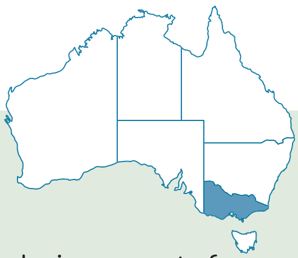
What it does

Adoption in agriculture depends heavily on trust, demonstration and practical proof. Producers are more likely to invest when they can see technologies working on farms like theirs, under local conditions, with clear implications for cost, reliability and day-to-day operations. Public co-investment should therefore support real-world pilots, demonstration farms, machinery trials, biofuel and electrification comparisons, regional training pathways and open performance data, so that investment decisions are driven by evidence from Australian conditions rather than overseas marketing claims.

How it spins the flywheel

Demonstrations, trials and training reduce perceived risk and build the practical skills needed for wider adoption. Side-by-side comparisons of diesel, biofuels and electric options in broadacre, dairy, horticulture, grazing and regional processing help producers understand where each technology fits and what it delivers in real budgets and operating conditions. As more farmers, service providers and financiers see reliable results and know how to work with new systems, the cost and complexity of being an early adopter falls, turning each successful project into momentum for the next.

This is particularly important in mixed and emerging technology spaces, where the choice is not yet obvious and early adopters carry more uncertainty. Producers need to know what actually works over time, how it is serviced and financed, and what happens when something breaks in the middle of harvest. Well-designed demonstrations and training reduce perceived risk, build skills and help ensure that early adopters are not left without support to start the shift.[66]



Michael Unwin, VIC

Michael operates a 100-acre vineyard and winery west of Ballarat. He runs his entire commercial winemaking, bottling, and cellar door operation completely off-grid using on-farm solar power.

The government should seek out local voices to help it coordinate its policies with the needs of local manufacturers, regional suppliers so the economic benefits stay in our communities.

Beyond electrification: energy sovereignty for inputs and natural capital

Energy sovereignty raises a wider question than electricity for machinery and buildings alone. Over time, regional renewable-energy systems can help underpin more secure access to other critical farm inputs and new income streams, including fertiliser and natural-capital services. In suitable regions, shared infrastructure — generation, storage, microgrids and digital systems — can support local production of inputs such as green ammonia and help keep more value, resilience and strategic control within regional communities.[67,68]

As regional Australia builds out more local generation, storage and electrified equipment, new options open up. Over time, low-cost renewable electricity can support more flexible local production of green ammonia and other fertiliser inputs, reducing exposure to volatile global gas and fertiliser markets. Emerging models include regional co-operatives using shared solar and storage as a platform for local input production, alongside storage and demand-response services to the grid. Early project activity in Australia and wider international experience suggest that this kind of local value-adding can strengthen both resilience and community wealth, although further work is needed to test where and when it is commercially viable.[69]

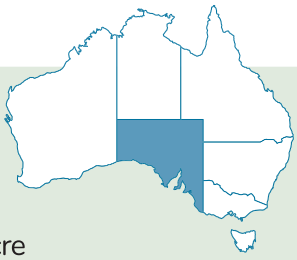
Natural capital is the other side of this opportunity: as farms electrify and build local energy systems, they also gain new ways to measure and value soil health, water, vegetation and biodiversity. Programs such as Farming for the Future and emerging farm-scale natural-capital accounting show that better measurement and valuation can support stronger farm performance and new income streams. Energy-sovereign regions are better placed to do this because they control more of the infrastructure needed to measure, verify and aggregate natural-capital services over time.[70,71,72,73]

Regional energy co-operatives and green ammonia

Regional Australia's energy shift should not stop at hosting wind and solar projects. Over time, it can also create the conditions for farmers and rural communities to own a larger share of the energy system and, in some places, to secure more of the agricultural inputs derived from that energy.

One practical future model is a regional farm-energy co-operative built around shared solar, battery storage and, where viable, modular green-ammonia production.[74] In this model, farmers first use low-cost renewable electricity to power farm operations and reduce exposure to volatile diesel and electricity prices. Deliberately oversized generation can then support flexible ammonia production when conditions suit, creating a pathway toward more local fertiliser supply as well as local energy supply. This approach is already being explored in emerging Australian projects, but more work is needed to test the economics, governance and best-fit regions[75] before treating it as a mainstream option.

In the near term, the priority is to accelerate electrification, reform fuel-tax settings and use public finance institutions to build the flywheel for lower-cost regional energy. Over the next decade, the same infrastructure can also support local fertiliser production, new natural-capital income and more diversified regional economies.



Gillian Fennell, SA

Gillian Fennell is based on a million-acre rangelands Charbray cattle station called Lambina Station. Gillian is the SA Representative for Australian Women in Agriculture and the Chair of Livestock SA.

"From the early RAPS units to modern solar pumps - farmers have been early adopters of renewables. Government needs to focus on removing the barriers to enable more farming businesses to upgrade their equipment and invest in new technology."

How the shift happens

Taken together, these recommendations point to a practical sequence for the next decade, showing where electrification, biofuels and regional energy systems are likely to move first and how farmers can plan ahead.

In practice, that shift is likely to unfold in a series of overlapping steps rather than a single jump. The first and fastest gains will come from electrifying stationary and short-range uses that are already well suited to today's technologies — pumps, cold storage, sheds, workshops, processing equipment and charging for light and medium vehicles. As these early uses scale, they will be followed by progressive electrification of more mobile plant and heavier machinery as products, support systems and regional infrastructure mature. Throughout, sustainable biofuels will have important bridging and specialist roles, particularly for legacy machines and genuinely hard-to-electrify tasks, but they are best understood as complements to structural electrification rather than a substitute for it.

1. Stationary electrification first
The first step, available now wherever there is a grid connection, is to use more electricity for loads that are already easy to connect: sheds, refrigeration, workshops, cold storage, water pumping, irrigation controls and local processing. In many regions this can start cutting diesel use immediately, without any new generation on farm.

2. Mobile electrification over time
The second step through this decade is to replace smaller and shorter-duty machines. Solar powered or grid charged electric pumps, compressors, materials-handling equipment and light vehicles are already in the market, and medium duty machinery will increasingly follow as products mature. Over the normal replacement cycle, each new electric unit displaces another slice of imported fuel with locally supplied power.

Looking into the 2030s, farms should be preparing for the electrification of heavier machinery and longer-haul transport as those products become commercially and technically viable for Australian conditions. That means planning ahead for higher-capacity connections, shared or on-farm charging, and storage sized to support larger tractors, headers and heavy vehicles as they become more widely available.

3. Biofuels as a bridge
Sustainable biofuels and renewable liquid fuels still have an important role, especially in hard-to-electrify and transitional applications such as existing tractors, harvesters, heavy machinery, remote operations, forestry, fisheries and some long-duty transport tasks. Biofuels should be treated as a bridge and a targeted solution, not as a substitute for serious work on electrification wherever electric options can do the job more efficiently and at lower long-term cost.

4. Regional energy systems
Over time, farms can move from simply using electricity to producing and managing more of their own. On-site solar, batteries and participation in local energy systems can permanently lower exposure to volatile fuel prices and unreliable supply, while broader regional investment in storage, charging, stronger networks and microgrids can make lower-cost energy more available across rural communities. The 2026–27 Federal Budget strengthens this case by confirming that fuel and fertiliser security are now central national concerns. The next step is to ensure that regional electrification and local energy systems become part of the national response, not an afterthought.

Conclusion

Australia's farmers and regional industries face a practical challenge: too much exposure to imported diesel, volatile fuel markets and energy systems they do not control. Farmers for Climate Action has consistently argued that regional communities need energy systems that are reliable, affordable and locally controlled. This policy roadmap applies that logic directly to farming, regional industry and fuel dependence.

The central propositions of this policy roadmap point to one clear conclusion: The current fuel system leaves agriculture exposed; the shift to cheaper, cleaner and more locally produced energy is already underway; government policy can accelerate that shift; and small and medium farm businesses must not be left carrying disproportionate risk as the system changes. Together, those propositions lead directly to the recommendations set out earlier: protect smaller farm businesses while reforming fuel tax settings, cap FTCS claims at $50m, invest in enabling infrastructure, use public finance institutions more strategically, modernise tax and regulatory rules, and build confidence through demonstration, training and open data.

The most credible way forward is to create conditions that allow farmers to choose what works best for their businesses, while national policy steadily reduces long-term reliance on imported liquid fuels.

This involves accelerating electrification where it is already commercially viable and strategically advantageous, while also investing in the infrastructure, financing, commercialisation, and regulatory reforms needed to make these options practical at scale. At the same time, sustainable biofuels should be supported for transitional uses and in sectors that are difficult to electrify. Importantly, energy sovereignty is not just about fuel or power—it also depends on stronger regional capability, more resilient farm businesses, and a broader range of practical options over time.

A serious report on strengthening rural Australia should therefore speak plainly. Diesel dependence is a vulnerability; energy sovereignty is the opportunity. The job of policy now is to turn that opportunity into practical change by reducing exposure, lowering risk, and giving regional Australians more durable control over the energy systems on which their businesses and communities depend.

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