Executive summary

Alternative energy opportunities for rural industries

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This executive summary accompanies a series of short reports commissioned by AgriFutures Australia on alternative energy opportunities for rural producers and farmers.

These reports were designed to help those at the heart of Australian agriculture better understand what alternative energy technologies are, why they may want to use them and how they work. Crucially, the series also investigates how producers can make informed investment decisions.

This executive summary provides an overview of why this project was undertaken and what the short reports contain.
The context

Many rural producers and farmers are looking to alternative or renewable energy technologies (e.g., solar PV, wind, bioenergy) to replace grid electricity, gas and fuels supplied from fossil fuels or conventional sources (e.g., coal, natural gas, diesel). The reasons for this shift are varied (Figure 1) and are often unique in each situation, but most commonly are to:

- Reduce greenhouse gas or carbon emissions in response to supply chain pressures and demands by customers; to meet personal, community and government aspirations and/or commitments to be carbon neutral or achieve net zero emissions (Figure 2) at a future date; or to ensure or unlock future access to export markets that have erected trade barriers or imposed carbon-based tariffs (e.g., European Union Carbon Adjustment Mechanism).
- Diversify income sources by producing and selling renewable energy and by-products (e.g., biodiesel, solar exported to the grid); co-utilising (land for agriculture and renewable energy (e.g., agri-photovoltaics); or creating and selling renewables energy certificates, carbon credits and/or other environmental certificates/offsets, to enable others to reduce their carbon emissions or footprint.
- Improve energy security and/or decrease energy costs, because renewables are becoming cheaper and can provide more stable pricing given recent escalation and volatility in conventional energy prices.
- Embrace the circular economy as doing so can enable producers to be more sustainable by extracting useful energy (or bioenergy) or by-products (e.g., biochar, nutrients) from biomass before it is disposed of.

There are many alternative energy technologies that can help rural producers and farmers achieve this transition. However, finding reliable information about them, such as how they work, how much they cost and how are they used, can be challenging. To assist rural producers and farmers, AgriFutures Australia engaged Colby Phillips Advisory to produce a series of short reports on different alternative energy technologies.

The short reports

Short report 1 introduces alternative energy technologies. It overviews what alternative energy technology means, the different technologies available and how they can replace conventional energy sources already being used by rural producers and farmers. Further, the report explores in more detail the reasons why producers might want to make this change, including examples of where it is already happened successfully.

Short reports 2-6 investigate the alternative energy technologies that producers are most likely to adopt now or are of immediate interest. These include solar PV, batteries, biofuels, wind power and hydrogen. Each short report explains how each technology works, what situations best suit adoptions, and what their costs may be. The reports include existing examples of where the technology has been successfully adopted.

Short report 7 overviews other alternative energy technologies that may be suitable in some situations (e.g., solar thermal, heat pumps, phase change materials, geothermal).

Short report 8 is an investment guide that supports producers when considering a major investment into an alternative energy technology. The investment guide includes, among other things, advice on what questions to ask, how to assess an opportunity, how to fund a project, how to successfully deliver a project, and where to look if extra support or guidance is needed.

Finally, a glossary has been prepared that provides definitions of the many different terms and acronyms used when describing or discussing alternative energy technologies.

These reports can be accessed and downloaded from the AgriFutures Australia website, www.agrifutures.com.au.
How can alternative energy replace conventional energy?

1 Conventional energy (fossil fuels)
   - Diesel
   - Petrol
   - Oil
   - LPG
   - Natural gas

2 Common rural industry uses
   - Farm machinery
   - Electrical generators
   - Fishing boat
   - Transport vehicles

3 Alternative energy technologies (current and emerging/future*)
   - Biodiesel
   - Bioethanol
   - Biomethane (compressed)
   - Hydrogen*
   - Biogas
   - Biomethane (compressed)
   - Gasification/pyrolysis*
   - Solar thermal*
   - Hydrogen*
   - Solar PV
   - Hydro
   - Gasification/pyrolysis*
   - Hydrogen*
   - Wind
   - Geothermal
   - Solar thermal*
   - Nuclear*

Alternative energy sources or technologies can replace (or supplement) current fossil fuels across many activities for rural industries – see Figure 2 below. Alternative energy can help rural communities and businesses use fewer fossil fuels, reduce their carbon emissions, and live or operate in a cleaner and more sustainable way, even reusing waste resources we already have.

Figure 2: Examples of conventional energy sources, their common rural industry uses, and the alternative energy technologies or sources that can replace them. Alternative energy technologies are divided between those considered currently available and can be immediately adopted and those* that are emerging and could be more readily available in the future. Some alternative energy technologies can be used across different rural industry uses.