

# Wilandra Farms, our story

- At Clydebank since 2011
- Milking about 380 cows year round
- 185 ha of irrigation, 4 centre pivots & K-Line sprinklers
- Farm is certified organic, aim is to be carbon neutral



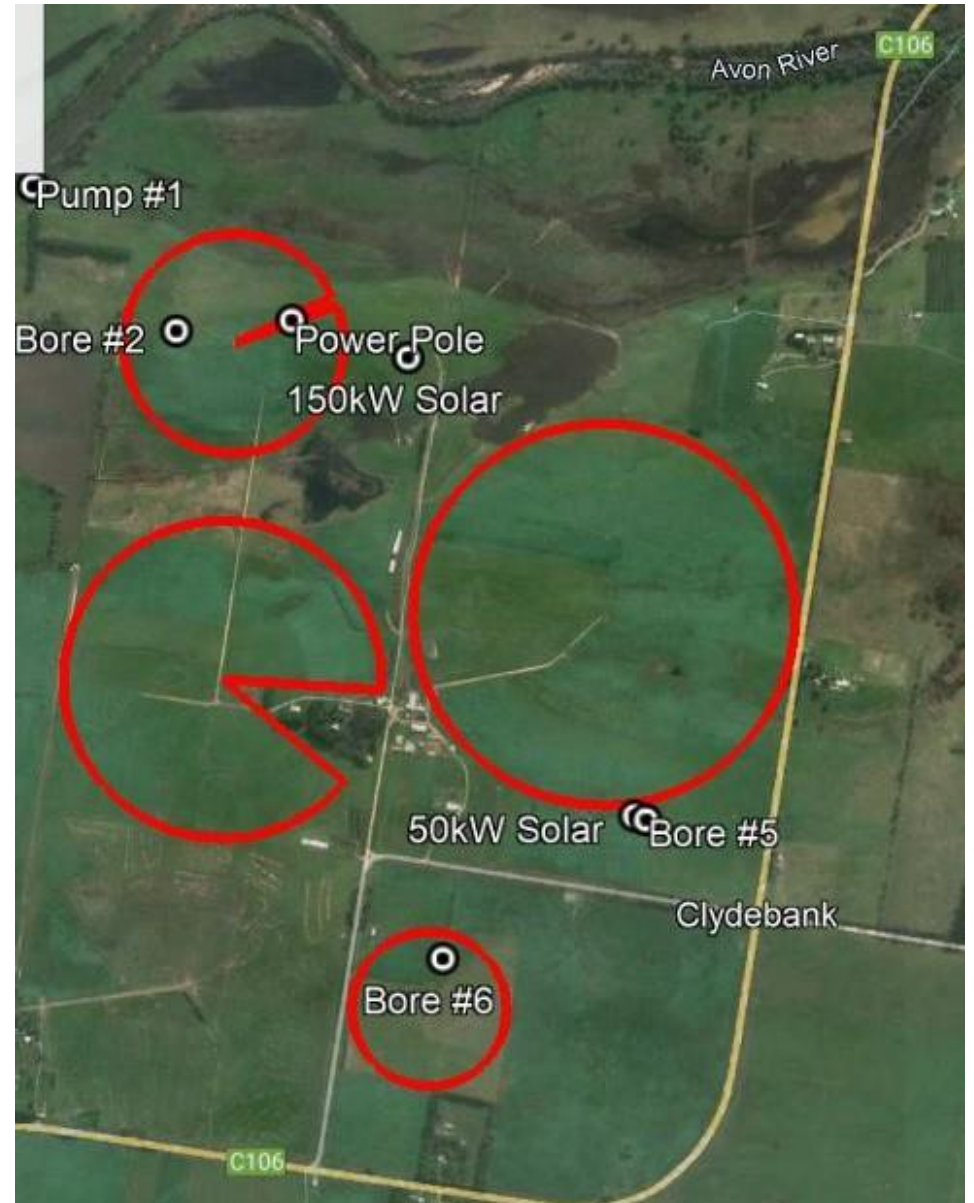
# What's today about?

- Bringing together people with an interest in reducing farm emissions and sequestering carbon, so we can all learn
- Demonstrating that renewable energy can reduce the need for grid power for irrigation and in dairies, and improve farm profitability
- Farming for the future – aim to make work easier for the farm operators, more comfy for the cattle, and to improve our levels of biodiversity and quality of natural resources, whilst making a profit
- Sharing what we're learning from others
- Farmers generally like a farm walk, we hope you enjoy!



# Wilandra Farms

- 8 titles
- 8 NMIs
- 2 bores
- 1 river pump
- 4 pivots
- Solar at 3 sites
- Farm not ideal for renewable energy utilisation



# Our energy journey

- 2017 was a very dry year. We were using about 500,000 kWh electricity a year, and diesel. Responsible for massive ghg emissions, with huge energy bills – wanted to change both
- 2018 - energy audit
- 2021 AgVic approved our project funding through the AEIP



# Previous irrigation system

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- Sandy loam soils, flood irrigation when we came here, suited to spray irrigation
- Labour-intensive, no automation
- Big distances between pumps and pivots
- Energy intense - big energy bills
- Mainly operated at night, using off peak power, can't see what's happening!
- Pivots got bogged, water kept pumping
- Not unusual for a system that's 10 years old
- Too expensive for a farm of our scale

# Improving irrigation energy efficiency

- Energy audits
- Irrigation infrastructure
  - Pumps
  - Pipes
  - Pivots
  - Dam



# Dairy changes

- Installed 29kW solar pv in 2017, north facing
- Lobe vacuum pump replaced 2 oil ring vac pumps – about 55% reduction in energy use. No oil changes, much cleaner
- CO2 Heat pump has replaced a conventional hot water service – about 40% reduction in energy use. There might be a better way to heat water...
- Milk cooling – new bore increases water flow through the plate heat exchanger, milk is 2 or 3 degrees cooler before it goes into the milk vat
- Revised wash process, lower temp water
- Arcoflex monitoring in place
- Other options were assessed, but hard to justify



# Renewable energy and irrigation

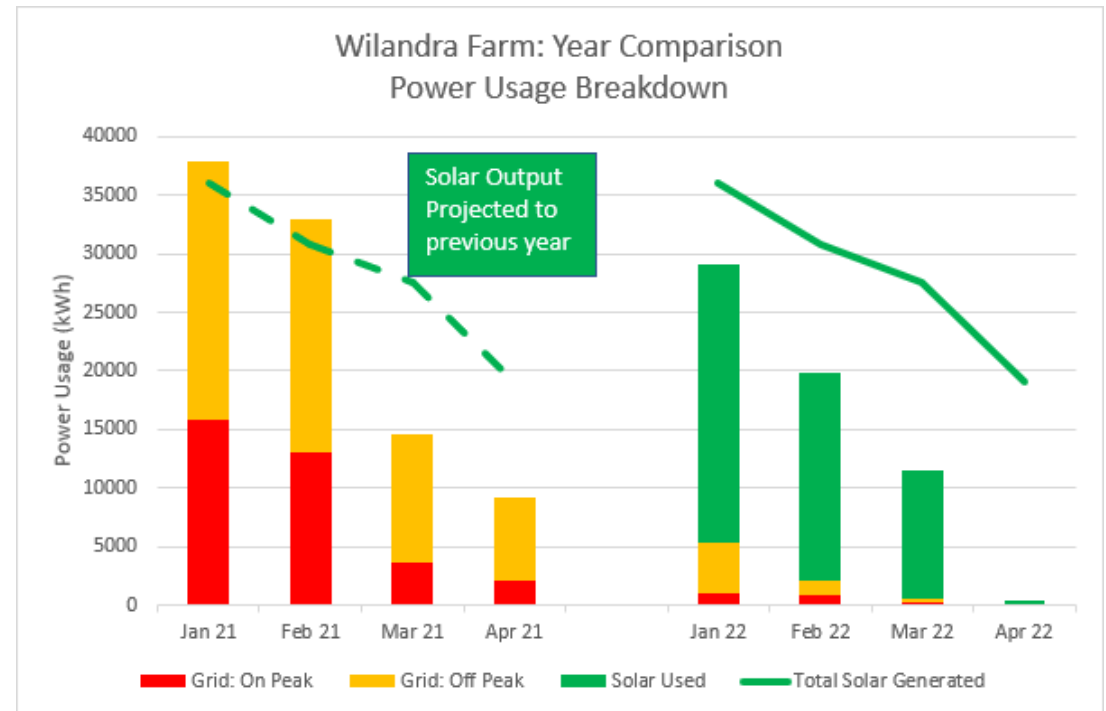
- Automation on pumps and pivots
- 150kW + 50kW new solar
- Wind turbines
- Energy management system
- The dam is a battery





# Irrigation costs 21/22

- A wet season, but still needed irrigation
- 2020/2021 season - cost of irrigation = \$80,000
- 2021/22 season = \$1200
- Cost per kWh down from 24c to -3c/kWh
- Due to energy efficiency measures, rainfall and the renewable energy
- Power generated almost covered load in the previous summer



## Other benefits of an integrated RE/irrigation system

- Less driving
- Less wear on bikes
- Time savings
- Less night-time irrigation
- Pivots turn off if bogged
- Less damage to pivots
- Lower GHG emissions
- More sleep!



# Reducing & offsetting emissions at Wilandra

- Clean electric power replacing fossil fuels – diesel replacement some way off
- Managing land to increase soil carbon
- Trees – store carbon & offer other benefits
- Will consider feed additive, such as Polygain
- Questions about herbaceous forage plants, saltbush?
- Dung beetles
- Carbon neutral and/or ACCUs



# Support required

- To assess emissions
- To create farm plans
- Incentives?
- Demonstrate how changes will benefit local landowners
- Local support required – AgVic, dairy company reps?

Lack of knowledgeable people to help

Consultants are expensive

Research seems to be slow and limited

Carbon credit schemes are confusing, expensive to start, complex, not aimed at average-sized farms

System is not easy to participate in

# Next steps

- Electric side-by-side ✓
- Fertigation through pivots ✓
- Electricity to pivots ✓
- Ongoing soil and pasture improvements
- AgVic Emissions Action Plan
- Farm micro grid?
- 100,000 trees by 2030
- Carbon neutral by 202??



# Thank you



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The Wilandra Smart Power Project received funding through the Victorian AEIP



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