



**ENERGY AUDITS**

**TARIFF REVIEW**

**ENERGY & POWER MANAGEMENT STRATEGY PLANNING**

**PROJECT MANAGEMENT**

# **TAILORED ENERGY SOLUTIONS**

## **CASE STUDY 1 – CORAL COAST BARRA FARM**



**GRID-CONNECTED & STAND-ALONE SOLAR SYSTEMS**

**BATTERY ENERGY STORAGE SYSTEMS**

**SOLAR WATER PUMPING**

**DEMAND MANAGEMENT**





# GFB FISHERIES GUTHALUNGRA

LARGE, COMPLEX USER – CAC, HV, >4GWh/Year





## ISSUES...

1. Required by Ergon to improve PF to 0.85 now.
2. kVA billing from 1 July 2015 = 20% cost increase.
3. Further billing change on 1 July 2016 (kVAr) = estimated further 5% cost increase.
4. Increase farm capacity 25% WITHOUT spending on electrical infra-structure.



## THE PROCESS...

1. Level 3 Energy Audit
2. Phased Implementation.
3. Measure & Report Outcomes.



## **LEVEL 3 ENERGY AUDIT:**

- 1. Desktop Audit & Tariff Review.**
- 2. Understand the Processes & Network.**
- 3. Data Log Switchboards & Equipment.**
- 4. HOW DOES THE WHOLE SYSTEM WORK!**
- 5. Consider ALL technological & operational options.**
- 6. Action Plan, Prioritised by Payback & ROI.**



## 4 MSBs:

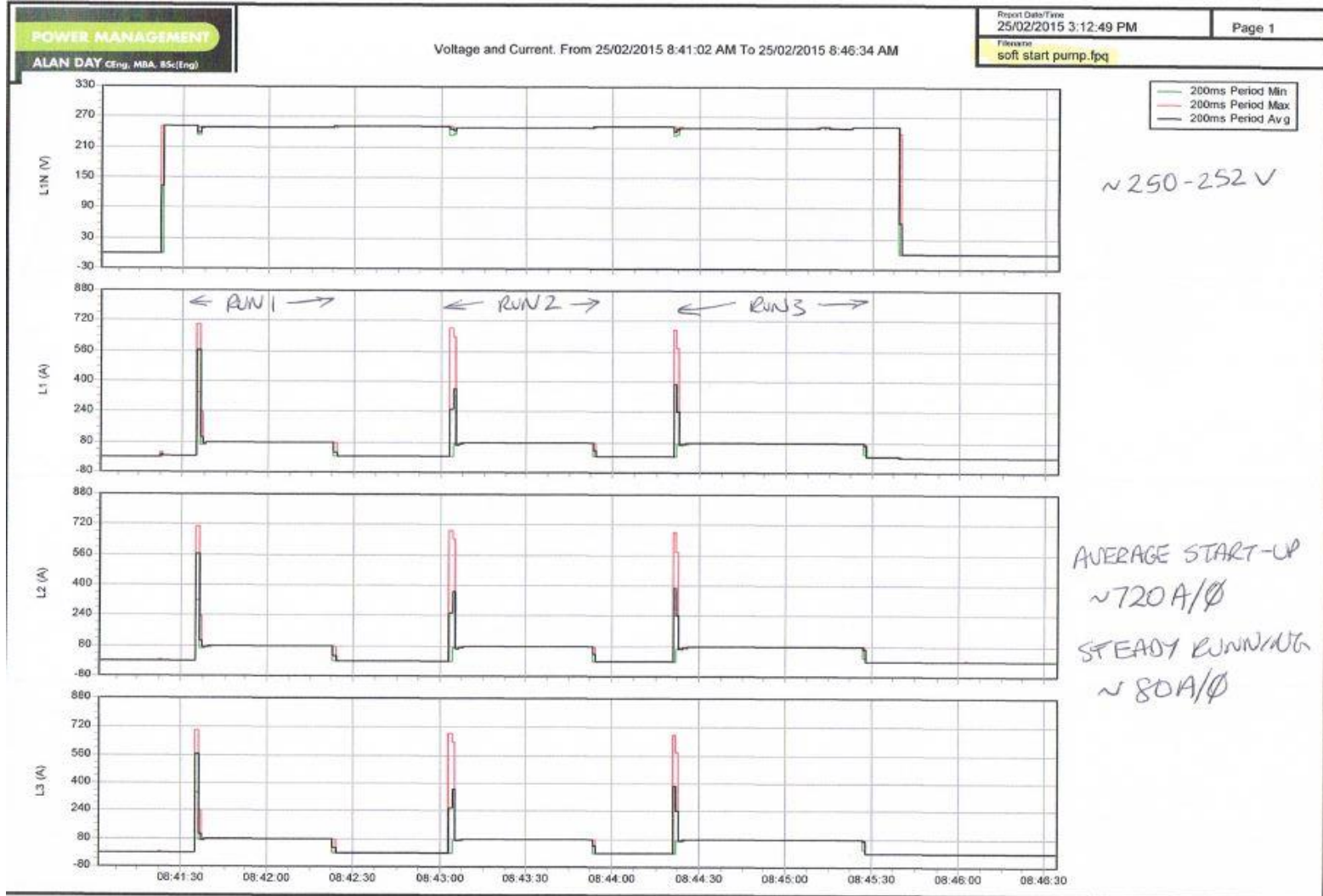
Sea Pumps	200kW
Lift Pumps	105kW
Production Tanks	238kW
Breedstock & Hatchery	80kW



<u>SUMMARY OF LOGGING RESULTS</u>						
	DAYS	ENERGY		POWER		PF
	LOGGING	Total kWh	kWh/Year	Average kW	Peak kW	
SEA PUMPS	14.5	50,000	1,258,621	200	518	0.817
LIFT PUMPS	7.0	11,500	599,643	105	210	0.884
PRODUCTION TANKS	12.0	57,000	1,733,750	238	280	0.778
BREED STOCK, HATCHERY	7.0	11,500	599,643	80	140	0.855
<b>TOTAL</b>	<b>40.5</b>		<b>4,191,656</b>	<b>623</b>	<b>1,148</b>	
<b>LAST 12 MONTHS</b>			<b>3,847,923</b>		<b>603</b>	<b>0.78</b>

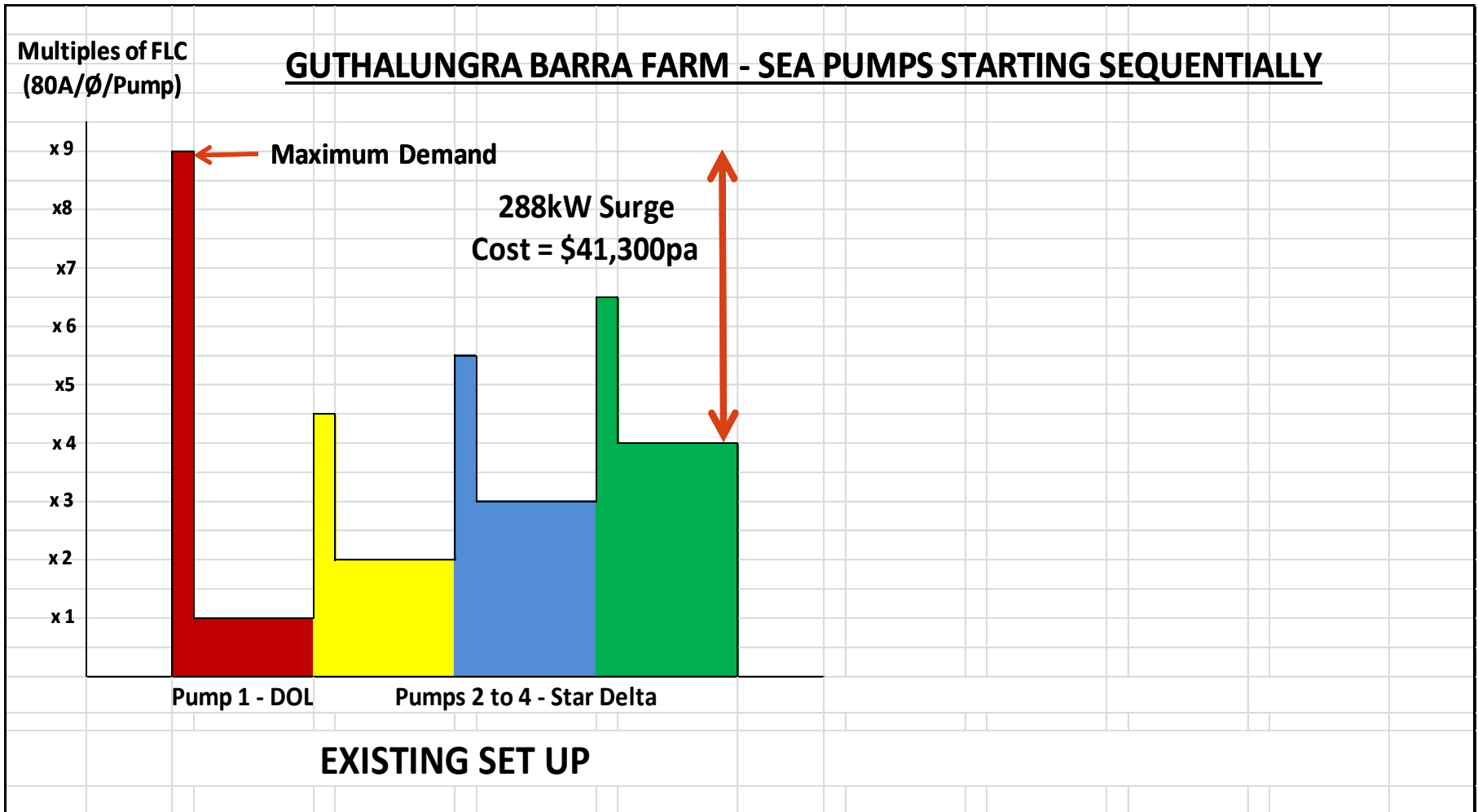
1. Reduce Sea Pump Peak Demand & PF
2. Reduce Lift Pump Energy Use & PF

# IDENTIFY PROBLEM WITH SEA PUMP 1 SOFT STARTER

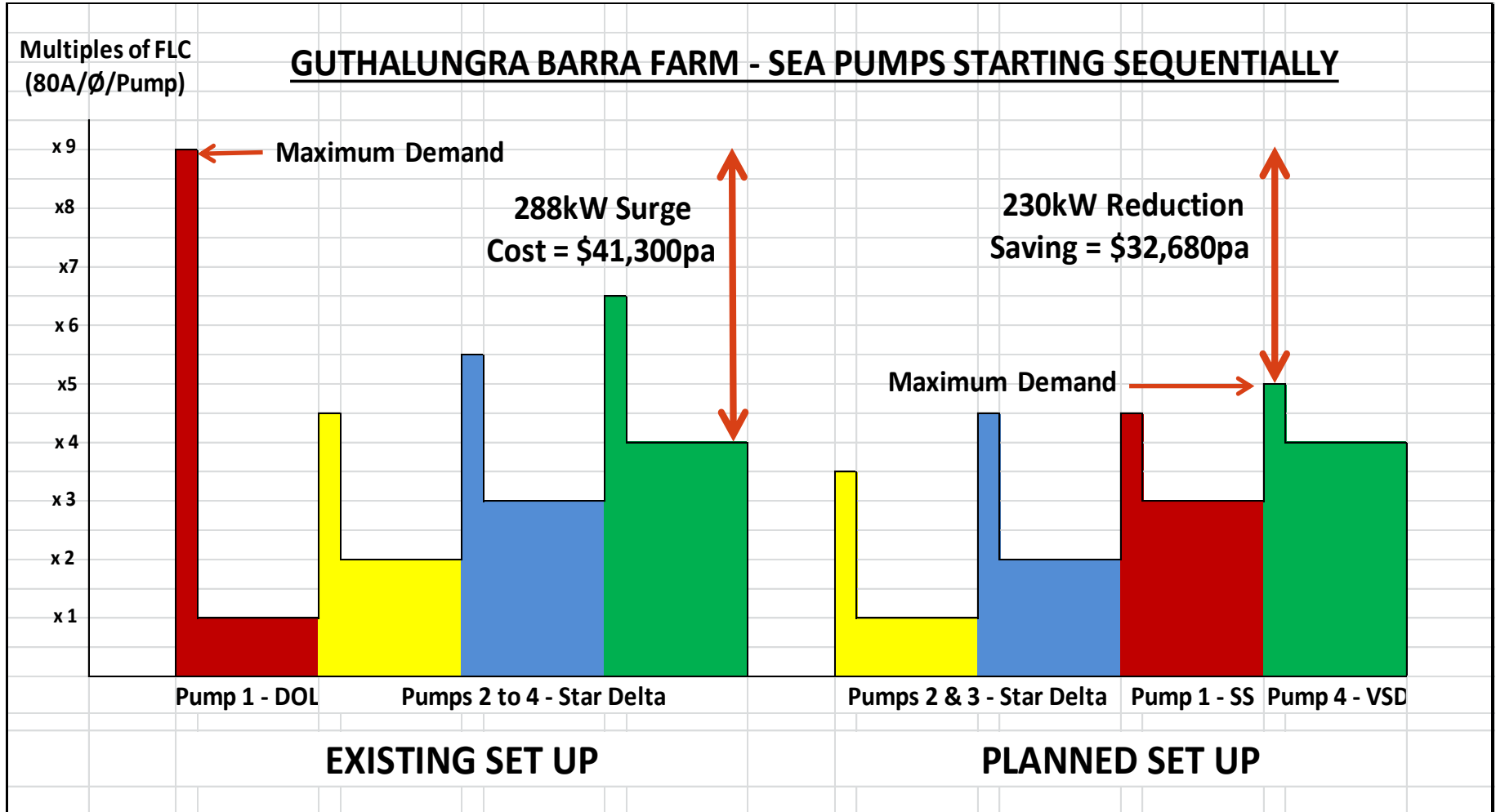




# Priority 1 - Reduce Sea Pump Demand Charges



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## **COST/BENEFIT**

- **Reinstall Pump 1 soft starter**
- **Supply & Install VSD to Pump 4 - \$14,680**
- **Demand Charge Savings = 79% = \$2,725/Month**
- **Payback = \$14,680 / \$32,680 = 5 Months & 2 Weeks**
- **ROI = 100 x \$32,680 / \$14,680 = 223%**



## **PRIORITY 2 – CUT LIFT PUMP RUNNING COSTS**

**Install VSDs - run the pumps at 75% of full speed**

### **COST/BENEFIT**

**Motor Speed ↓ 25% = Energy Use ↓ 40%**

**Project Cost \$28,108, Savings \$18,068pa**

**Payback 19 Months**



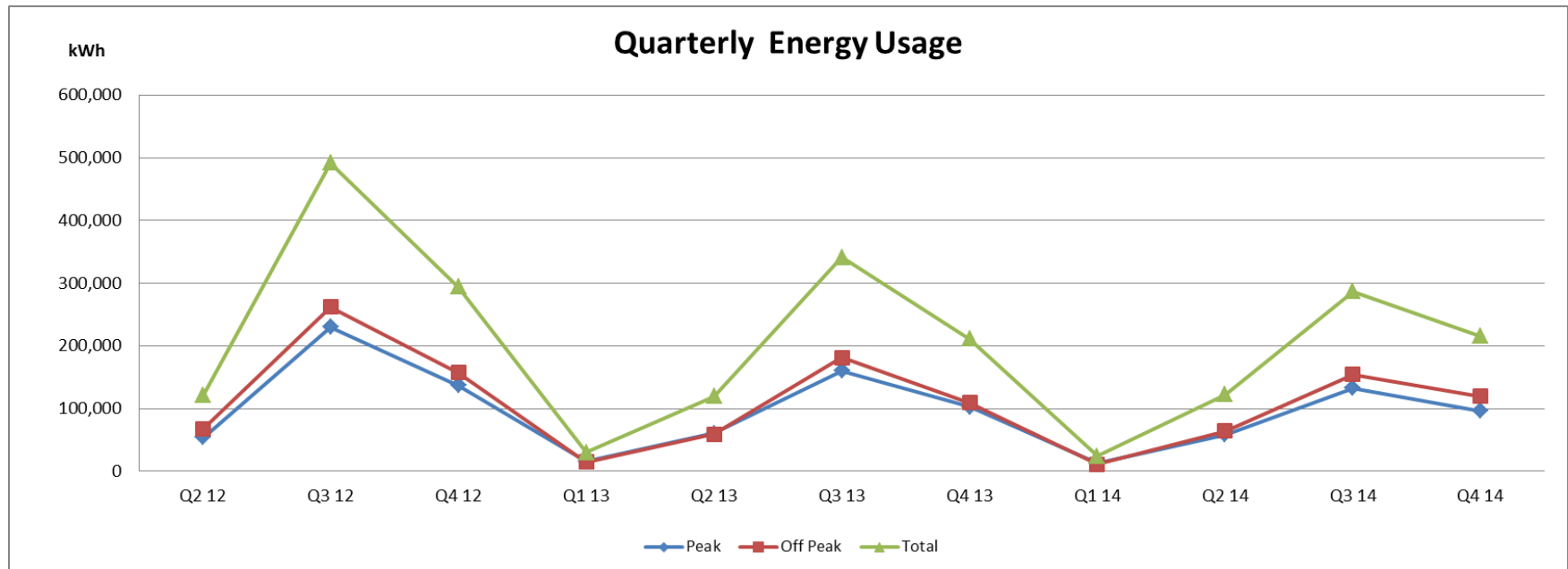
## **AN ONGOING, INCREMENTAL PROCESS ...**

- 1. Independent advice – there is no silver bullet**
- 2. Look for the “low hanging fruit”**
- 3. Take a staged approach – “prove it!”**
- 4. Assess projects outcomes against the audit baseline**
- 5. Flex the plan with experience & new technologies/ideas**

# CASE STUDY 2 – KOORELAH FARMS

## Projects:

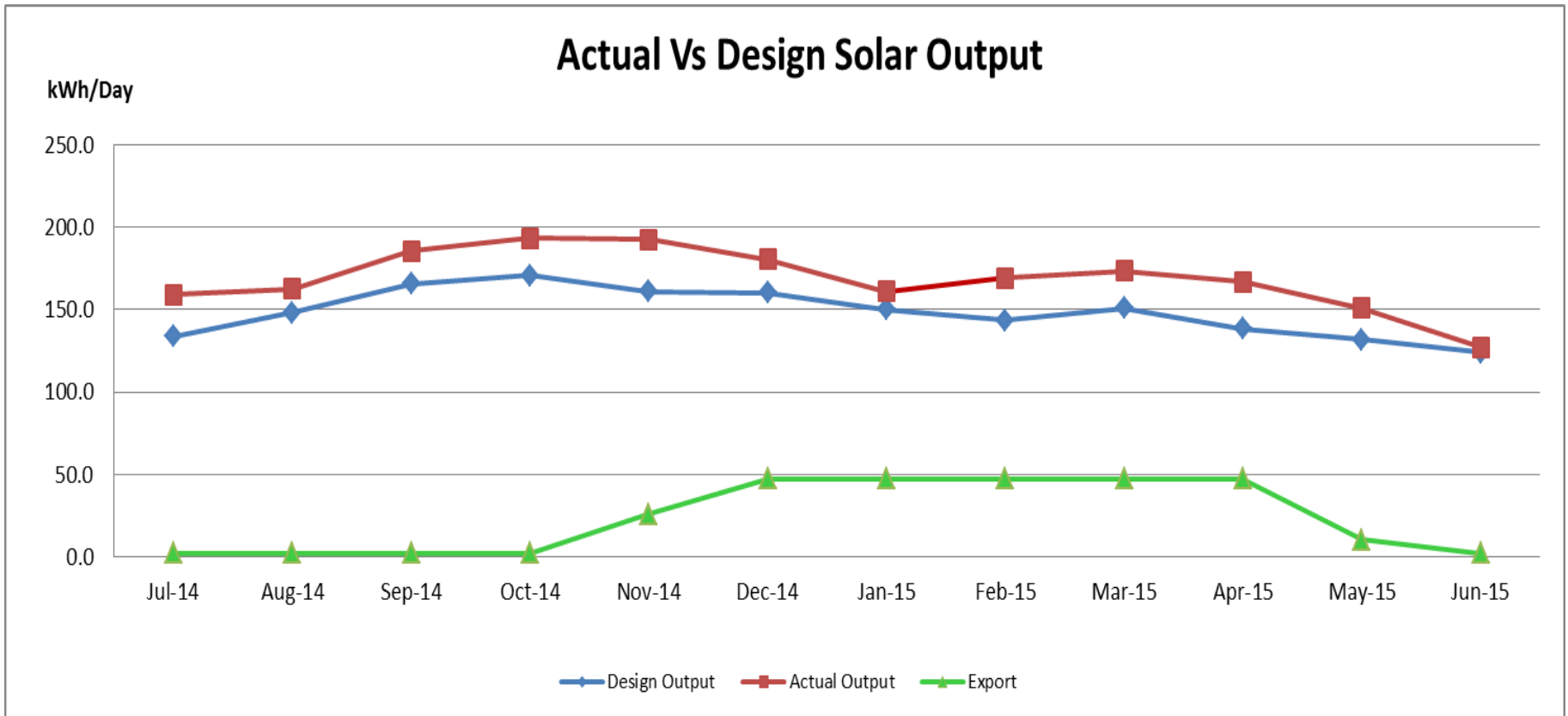
- Upgrade Cold Stores with VSDs.
- 30kW Solar System.
- LED Lighting to Packing Shed & Cold Stores







# SOLAR OUTCOME – 6 MONTH/YEAR RUNNING



**Payback = 2 Years 11 Months ( After 14% Export)**



## **KOORELAH FARMS - LED LIGHTING**

- **120 twin 36W fluoro & 25 x 150W floodlights.**
- **The shed operates 10 Hours/Day, 265 Days/Year.**
- **90W to run a twin Fluoro = \$76.32 pa/Fitting. Replace with 18W LED tubes to reduce the running cost/fitting to \$32.22 pa.**
- **168W to run a Floodlight = \$142.46 pa/Light. Replace with 50W LED floodlights to reduce the running cost/fitting to \$44.94 pa.**



## **COST/BENEFIT OUTCOME**

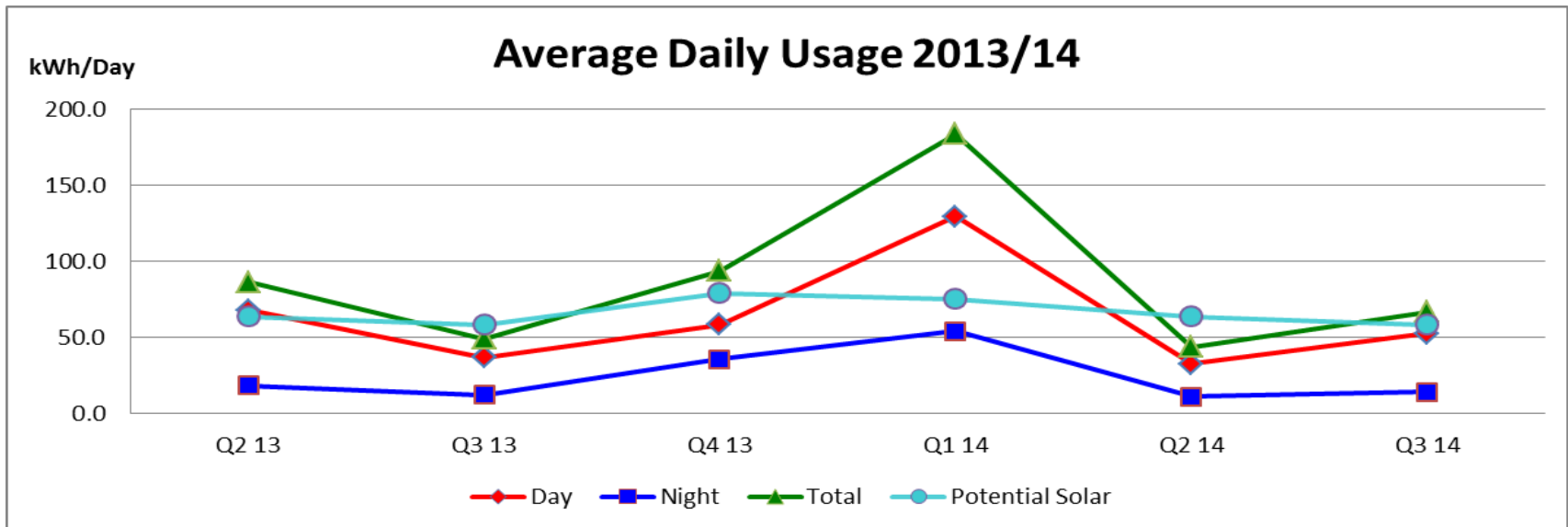
	<b>TUBES</b>	<b>FLOODLIGHTS</b>
<b>CAPITAL COST</b>	<b>\$5,607</b>	<b>\$2,270</b>
<b>INSTALLATION</b>	<b>\$1,200</b>	<b>\$300</b>
<b>TOTAL</b>	<b>\$6,807</b>	<b>\$2,570</b>
<b>ANNUAL SAVING</b>	<b>\$5,292</b>	<b>\$2,926</b>
<b>PAYBACK (SIMPLE)</b>	<b>1.3 Years</b>	<b>0.9 Years</b>
<b>ROI</b>	<b>77.7%</b>	<b>113.9%</b>

# CASE STUDY 3 – ADD SOLAR TO BORE PUMP

The Farm's main bore pump uses an average 97.1 kWh/Day (ranges from 43.7 to 183.9).

Cost (T20) is \$8,870/year.

Consider using a Solar Array with the Mains Supply.



## PROPOSAL...



- **Install a 15kW Solar System (Ø Export).**
- **Change to Tariff T65 & maximise daylight running.**
- **Requires a fenced area approx 15m x 9m & setting of array frame posts (post holes & concrete) – not included in costing.**
- **Pump can be upgraded to a solar pump when necessary.**
- **Cost = \$23,140 (net of 310 STCs, current value \$11,600).**
- **Energy saving = \$5,900pa**
- **Payback (Simple) = 3.9 Years, ROI = 25.5%**



# QUESTIONS...?

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