COMPARISON OF DIESEL VS ELECTRIC PUMPING COSTS

Brian Leib, Extension Irrigation Specialist - University of Tennessee

2012 Average Center Pivots, page 1

	Diesel		Electric: Demand	
Pump Efficiency	70	%	70	%
Gear Head Efficiency	95	%	100	%
Motor Efficiency	30	%	82	%
Bhp per Unit of Fuel	16.3	Bhp/gallon	1.10	Bhp/kW-hr
Price	3.80	$/gal	150	$/month - Service Fee
			50	kW - Demand Base
			14.64	$/KW - Demand Rate
			0.10321	$/kW-hr - Initial Rate
			15000	kW-hr - Rate Change
			0.05963	$/kW-hr - 2nd Rate

Low Pressure Drop System Applying 6 inches of Water on: 175 acres

TDH	HORSE-POWER	LIFT	$/ac-in Diesel	$/ac-in Electric	Annual Power Cost Diesel	Annual Power Cost Electric	Added Investment for Electric $ 10,000	$ 15,000	$ 20,000
							Electric Payback in Years at 5%		
125'	50	50-flat	5.01	3.63	$ 5,256	$ 3,812	8.5	14.5	23.2
175'	70	100' flat or 50' rolling	7.01	4.68	$ 7,358	$ 4,918	4.6	7.3	10.5
225'	90	150' flat or 100' rolling	9.01	5.72	$ 9,460	$ 6,006	3.1	4.9	6.8
275'	110	200' flat or 150' rolling	11.01	6.64	$ 11,562	$ 6,975	2.3	3.6	4.9
325'	130	250' flat or 200' rolling	13.01	7.57	$ 13,665	$ 7,945	1.8	2.8	3.8
375'	150	300' flat or 250' rolling	15.02	8.49	$ 15,767	$ 8,914	1.5	2.3	3.2

	Diesel		Electric: Off-Season	
Pump Efficiency	70	%	70	%
Gear Head Efficiency	95	%	100	%
Motor Efficiency	30	%	82	%
Bhp per Unit of Fuel	16.3	Bhp/gallon	1.10	Bhp/kW-hr
Price	3.80	$/gal	150	$/month - Service Fee
			50	kW - Demand Base
			0	$/KW - Demand Rate
			0.11321	$/kW-hr - Initial Rate
			15000	kW-hr - Rate Change
			0.06963	$/kW-hr - 2nd Rate

Low Pressure Drop System Applying 6 inches of Water on: 175 acres

TDH	HORSE-POWER	LIFT	$/ac-in Diesel	$/ac-in Electric	Annual Power Cost Diesel	Annual Power Cost Electric	Added Investment for Electric $ 10,000	$ 15,000	$ 20,000
							Electric Payback in Years at 5%		
125'	50	50-flat	5.01	3.82	$ 5,256	$ 4,007	10.2	18.1	31.3
175'	70	100' flat or 50' rolling	7.01	4.66	$ 7,358	$ 4,890	4.5	7.2	10.3
225'	90	150' flat or 100' rolling	9.01	5.29	$ 9,460	$ 5,551	2.7	4.3	5.9
275'	110	200' flat or 150' rolling	11.01	5.80	$ 11,562	$ 6,094	1.9	3.0	4.0
325'	130	250' flat or 200' rolling	13.01	6.32	$ 13,665	$ 6,636	1.5	2.3	3.1
375'	150	300' flat or 250' rolling	15.02	6.84	$ 15,767	$ 7,179	1.2	1.8	2.5

COMPARISON OF DIESEL VS ELECTRIC PUMPING COSTS

Brian Leib, Extension Irrigation Specialist - University of Tennessee

2012 Smaller Center Pivots, page 2

	Diesel		Electric: Demand	
Pump Efficiency	70	%	70	%
Gear Head Efficiency	95	%	100	%
Motor Efficiency	30	%	82	%
Bhp per Unit of Fuel	16.3	Bhp/gallon	1.10	Bhp/kW-hr
Price	3.80	$/gal	150	$/month - Service Fee
			50	kW - Demand Base
			14.64	$/KW - Demand Rate
			0.10321	$/kW-hr - Initial Rate
			15000	kW-hr - Rate Change
			0.05963	$/kW-hr - 2nd Rate

Low Pressure Drop System Applying 6 inches of Water on: 125 acres

TDH	HORSE-POWER	LIFT	$/ac-in Diesel	$/ac-in Electric	Annual Power Cost Diesel	Annual Power Cost Electric	Added Investment for Electric $ 10,000	$ 15,000	$ 20,000
							Electric Payback in Years at 5%		
125'	35	50-flat	5.01	4.32	$ 3,754	$ 3,237	59.7		
175'	50	100' flat or 50' rolling	7.01	5.08	$ 5,256	$ 3,812	8.5	14.5	23.2
225'	65	150' flat or 100' rolling	9.01	6.06	$ 6,757	$ 4,544	5.1	8.3	12.0
275'	80	200' flat or 150' rolling	11.01	7.27	$ 8,259	$ 5,452	3.9	6.2	8.8
325'	90	250' flat or 200' rolling	13.01	8.19	$ 9,760	$ 6,144	3.0	4.6	6.5
375'	105	300' flat or 250' rolling	15.02	9.12	$ 11,262	$ 6,837	2.4	3.7	5.1

	Diesel		Electric: Off-Season	
Pump Efficiency	70	%	70	%
Gear Head Efficiency	95	%	100	%
Motor Efficiency	30	%	82	%
Bhp per Unit of Fuel	16.3	Bhp/gallon	1.10	Bhp/kW-hr
Price	3.80	$/gal	150	$/month - Service Fee
			50	kW - Demand Base
			0	$/KW - Demand Rate
			0.11321	$/kW-hr - Initial Rate
			15000	kW-hr - Rate Change
			0.06963	$/kW-hr - 2nd Rate

Low Pressure Drop System Applying 6 inches of Water on: 125 acres

TDH	HORSE-POWER	LIFT	$/ac-in Diesel	$/ac-in Electric	Annual Power Cost Diesel	Annual Power Cost Electric	Added Investment for Electric $ 10,000	$ 15,000	$ 20,000
							Electric Payback in Years at 5%		
125'	35	50-flat	5.01	4.50	$ 3,754	$ 3,376			
175'	50	100' flat or 50' rolling	7.01	5.34	$ 5,256	$ 4,007	10.2	18.1	31.3
225'	65	150' flat or 100' rolling	9.01	6.18	$ 6,757	$ 4,637	5.4	8.7	12.7
275'	80	200' flat or 150' rolling	11.01	6.99	$ 8,259	$ 5,240	3.6	5.7	8.0
325'	90	250' flat or 200' rolling	13.01	7.50	$ 9,760	$ 5,628	2.6	4.0	5.5
375'	105	300' flat or 250' rolling	15.02	8.02	$ 11,262	$ 6,016	2.0	3.1	4.2

COMPARISON OF DIESEL VS ELECTRIC PUMPING COSTS

Brian Leib, Extension Irrigation Specialist - University of Tennessee

2012 Larger Center Pivots, page 3

	Diesel		Electric: Demand	
Pump Efficiency	70	%	70	%
Gear Head Efficiency	95	%	100	%
Motor Efficiency	30	%	82	%
Bhp per Unit of Fuel	16.3	Bhp/gallon	1.10	Bhp/kW-hr
Price	3.80	$/gal	150	$/month - Service Fee
			50	kW - Demand Base
			14.64	$/KW - Demand Rate
			0.10321	$/kW-hr - Initial Rate
			15000	kW-hr - Rate Change
			0.05963	$/kW-hr - 2nd Rate

Low Pressure Drop System Applying 6 inches of Water on: 225 acres

TDH	HORSE-POWER	LIFT	$/ac-in Diesel	$/ac-in Electric	Annual Power Cost Diesel	Annual Power Cost Electric	Added Investment for Electric $ 10,000	$ 15,000	$ 20,000
							Electric Payback in Years at 5%		
125'	65	50-flat	5.01	3.37	$ 6,757	$ 4,544	5.1	8.3	12.0
175'	90	100' flat or 50' rolling	7.01	4.45	$ 9,460	$ 6,006	3.1	4.9	6.8
225'	115	150' flat or 100' rolling	9.01	5.37	$ 12,163	$ 7,252	2.1	3.3	4.6
275'	140	200' flat or 150' rolling	11.01	6.30	$ 14,866	$ 8,499	1.6	2.5	3.4
325'	165	250' flat or 200' rolling	13.01	7.22	$ 17,569	$ 9,745	1.3	2.0	2.7
375'	190	300' flat or 250' rolling	15.02	8.14	$ 20,272	$ 10,992	1.1	1.7	2.3

	Diesel		Electric: Off-Season	
Pump Efficiency	70	%	70	%
Gear Head Efficiency	95	%	100	%
Motor Efficiency	30	%	82	%
Bhp per Unit of Fuel	16.3	Bhp/gallon	1.10	Bhp/kW-hr
Price	3.80	$/gal	150	$/month - Service Fee
			50	kW - Demand Base
			0	$/KW - Demand Rate
			0.11321	$/kW-hr - Initial Rate
			15000	kW-hr - Rate Change
			0.06963	$/kW-hr - 2nd Rate

Low Pressure Drop System Applying 6 inches of Water on: 225 acres

TDH	HORSE-POWER	LIFT	$/ac-in Diesel	$/ac-in Electric	Annual Power Cost Diesel	Annual Power Cost Electric	Added Investment for Electric $ 10,000	$ 15,000	$ 20,000
							Electric Payback in Years at 5%		
125'	65	50-flat	5.01	3.44	$ 6,757	$ 4,637	5.4	8.7	12.7
175'	90	100' flat or 50' rolling	7.01	4.11	$ 9,460	$ 5,551	2.7	4.3	5.9
225'	115	150' flat or 100' rolling	9.01	4.63	$ 12,163	$ 6,249	1.8	2.7	3.7
275'	140	200' flat or 150' rolling	11.01	5.15	$ 14,866	$ 6,947	1.3	2.0	2.7
325'	165	250' flat or 200' rolling	13.01	5.66	$ 17,569	$ 7,645	1.0	1.6	2.1
375'	190	300' flat or 250' rolling	15.02	6.18	$ 20,272	$ 8,343	0.9	1.3	1.8