



**To:** Patty Hanz, EMA  
**From:** Amy Gelsinger, Senior Consultant, Trinity Consultants  
**Date:** November 23, 2021  
**RE:** Updated SORE Utility Analysis for SRIA Comments

On September 20, 2021, CARB released Updated Amendments to the Small Off-Road Engine (SORE) Exhaust and Evaporative Emissions Regulations Standardized Regulatory Impact Assessment (SRIA) which describes the costs to residential consumers and professional lawn care providers of CARB's proposed regulation, set forth in the Initial Statement of Reasons released on October 12, 2021. The proposed regulation calls for the transition of all SORE equipment, both handheld and non-handheld, to Zero Emissions Equipment (ZEE) by 2024 for all equipment except generators, which would transition to ZEE in 2028.

This memo provides an analysis showing that there are considerations to a ZEE transition besides cost – specifically, the Utility: capability, performance, and function, of gasoline powered equipment vs ZEE which are significant. This memo includes both a Cost comparison of commercially available popular equipment as well as a Utility comparison.

The equipment used in this analysis are detailed in Appendix A. Products represented are the top ten "Best Sellers" in each category at HomeDepot.com. Where less than ten were available, options from other sellers were added, where possible. Additional information for this analysis was collected from EMA manufacturers, the CARB SORE Survey, CARB SORE2020 model, and CARB SRIA and CARB ISOR. Some data and figures taken from the Survey Report provided by Cal Fullerton: *"Survey of Small Off-Road Engines (SORE) Operating within California: Results from Surveys with Four Statewide Populations"* herein referred to as "The CARB Survey." Note that the Survey data represents the whole population of equipment currently in use and not just recent sales. Some figures provided by AIR using the CARB Survey data.

This analysis looks only at ground-supported equipment and not handheld equipment. Equipment evaluated in this analysis includes Walk Behind Lawn Mowers -both Residential and Professional; Riding Lawn Tractors – both Residential and ZTR mowers for Professional riding mowers; Pressure Washers, with Professional pressure washers designated as those with capability above 3500psi; Portable Generators; and Pumps <2hp, to represent Utility Equipment. Pumps greater than 2hp are also included to for professional Utility equipment.

CARB is preempted from regulating engines in the SORE category that are used in new farm and construction equipment under the Clean Air Act. CARB presumes that SORE engines are not covered by the Clean Air Act but has published a list of equipment types that they agency agrees are preempted <https://ww3.arb.ca.gov/msprog/offroad/preempt.htm>. The Utility Analysis assumes that the applications assessed are not covered by the farm and construction preemption although some could be – e.g. pressure washers and compressors.

Note that for Cost analysis, an average of all models was used. CARB seems to have used a combination of an average of top selling models and one single model specified in Table G1-6.

Below are cost comparisons similar to those used in the SRIA based on equipment listed in the "G" Tables found in Appendix A. Note that these are prices from November 2021 and are in 2021\$. Prices shown for battery powered equipment only.

Table C3: Current Upfront Price of Residential SORE and ZEE			
Type of Equipment	SORE Equipment Price	ZEE Price	Incremental Cost over Baseline Scenario
Generator Set	\$ 1,520	\$ 1,699	\$ 179
Lawnmower	\$ 393	\$ 462	\$ 69
Pressure Washer	\$ 388	\$ 434	\$ 46
Pump <2hp	\$ 325	\$ 314	\$ (11)
Riding Mower (Tractor)	\$ 2,319	\$ 3,293	\$ 974

Table C4: Current Upfront Price of Professional SORE and ZEE			
Type of Equipment	SORE Equipment Price	ZEE Price	Incremental Cost over Baseline Scenario
Generator Set	\$ 1,520	\$ 1,699	\$ 179
Lawnmower	\$ 1,728	\$ 1,865	\$ 137
Pressure Washer	\$ 2,794	Not Available	-
Pumps	\$ 742	\$ 2,367	\$ 1,625
Riding Mower (ZTR)	\$ 5,199	\$ 8,436	\$ 3,237

Note that Professional Walk Behind Lawnmower prices include the cost of additional batteries in order to get through a day of work (5-6 hours or ~10 acres of mowing, assuming that other equipment will be used for the rest of the work day) without charging. Riding lawn mowers do not have replaceable batteries and may not have sufficient power capacity for a whole day without plugging in the equipment.

Table C8: Estimated Annual Energy Consumption for Residential SORE and ZEE		
Type of Equipment	SORE Equipment Fuel Consumption g/yr	ZEE Electricity Consumption kWh/yr
Generator Set	0.8	8.0
Lawnmower	3.6	38
Pressure Washer	0.9	10
Pump <2hp	10	100
Riding Mower	26	296

Table C8 is based on manufacturer provided fuel economy and CO2 emissions data, and annual usage estimates from the CARB SORE survey as follows:

Estimated Residential Usage	
Type of Equipment	Annual Hours of Use
Generator Set	8.0
Lawnmower	12.0
Pressure Washer	7.5
Pump <2hp	20
Riding Mower	72

Table C9: Estimated Annual Energy Consumption for Professional SORE and ZEE

Type of Equipment	SORE Equipment Fuel Consumption gal/yr	ZEE Electricity Consumption kWh/yr
Generator Set	83	879
Lawnmower	1295	3494
Pressure Washer	5.20	36.30
Pumps	83	1040
Riding Mower	863	2330

Table C9 is based on manufacturer provided fuel economy and CO2 emissions data, and annual usage estimates from the CARB SORE survey as follows:

Estimated Professional Usage	
Type of Equipment	Annual Hours of Use
Generator Set	96.0
Lawnmower	1560.0
Pressure Washer	26.0
Pump	104
Riding Mower	1040

Energy costs are estimated as follows, with professional equipment assumed to use the commercial rate for electricity:

Energy Costs		
Gasoline	\$4.40	CA average, 10/2/21, AAA
Electricity - Residential	\$0.23	CA average, Aug 2021, eia.gov
Electricity - Commercial	\$0.21	CA average, Aug 2021, eia.gov

Table C11 Annual Energy Costs				
Type of Equipment	Gasoline Costs-Professional	Gasoline Costs-Residential	Electricity Costs - Professional	Electricity Costs-Residential
Generator Set	\$ 367.07	\$ 3.52	\$ 187.46	\$ 1.87
Lawnmower	\$ 5,697.12	\$ 16.05	\$ 745.01	\$ 8.88
Pressure Washer	\$ 22.88	\$ 4.03	\$ 7.74	\$ 2.44
Pump <2hp	\$ 366.08	\$ 44.00	\$ 221.73	\$ 23.35
Riding Mower	\$ 3,798.08	\$ 114.05	\$ 496.67	\$ 69.06

While the upfront cost (except for riding/ZTR mowers) and annual usage costs do not appear to make ZEE prohibitively expensive, these costs do not tell the whole story. While the availability and capability of ZEE lawn and garden equipment has improved, even over the last year, it still does not meet the performance of SORE equipment, particularly for professional users. The following collection of charts describe typical residential and professional use based on the CARB survey and visually indicate the capability of SORE equipment vs ZEE. The graphs include both gasoline-powered and battery electric equipment, and where applicable, corded electric equipment as well.

## Residential Walk-Behind Lawn Mowers

The CARB Survey indicates the following residential use:

Figure 4. Power Type of Lawn Mowers Owned by Households

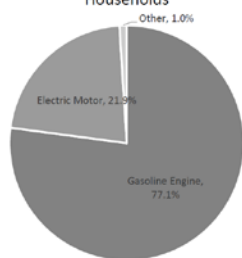
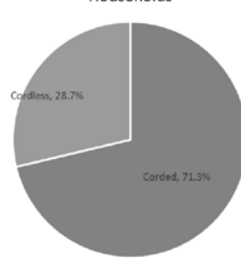


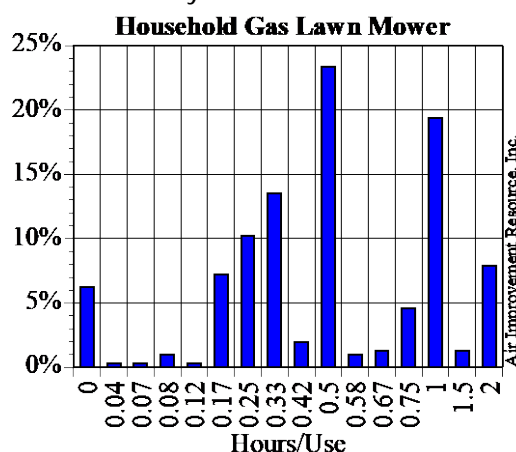
Figure 5. Presence of Cord for Electric Lawn Mowers Owned by Households



From the CARB Survey:

Frequency Used	# of Mowers	% of Mowers
Not used	43	10.5%
Less than four times per year	37	9.0%
Four to 11 times per year	41	10.0%
Twelve to 24 times per year	170	41.4%
25 to 51 times per year	27	6.6%
52 times per year	80	19.5%
More than 52 times per year	13	3.2%
<b>Total</b>	<b>411</b>	<b>100.0%</b>

From AIR analysis:



According to the AIR analysis of the CARB data, a run time of 30-60 minutes covers approximately 90% of residential lawn mower uses. Therefore, the below chart is based on a one-hour use time. The points for gas equipment indicate peak power in kW. Since SORE equipment does not always run at peak power, the blue dashed line on the graphs takes load factor into consideration. The line represents the average of the peak power for the equipment shown, multiplied by the average load factor (as provided by the EMA manufacturers). This is the power required for ZEE to have equivalent operating power as SORE equipment. Battery powered equipment is not advertised by peak power, but rather by battery capacity, as indicated by a combination of Voltage and Capacity in Amp Hours. From this information, the capacity in kWhr can be determined. The points on the graph are battery capacity over the given time period, in the case of residential mowers, 1 hour. This is the maximum power the battery can sustain for the given time

period. As the graph shows, ZEE mowers' peak power does not meet the SORE mowers average power output.

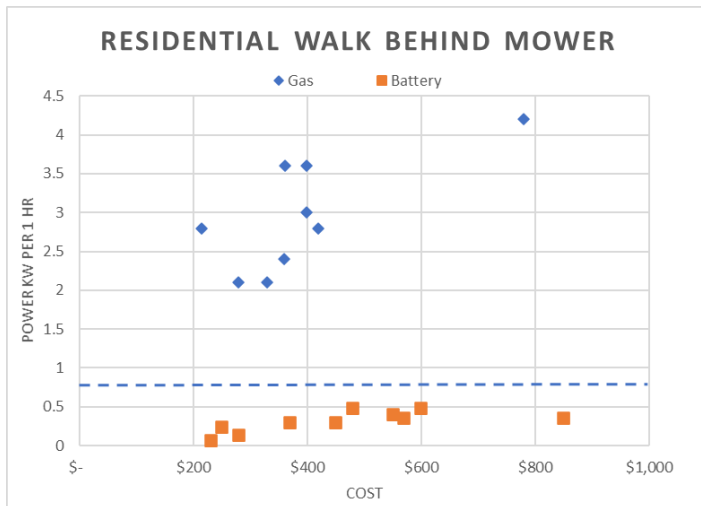


Figure 1. Power vs. Cost for Residential Walk Behind Mowers

#### Notes:

- Currently available battery-powered walk behind mowers are in the same price range as gas-powered mowers but have less power.
- This category has the most battery powered equipment currently available.
- Corded electric mowers are inexpensive and meet a minimum power threshold but have limited practicality (small yards only). Corded lawn mowers not shown.
- According to manufacturers, electric lawn mowers are not capable of cutting wet, tall, or thick grass.
- According to manufacturers, an electric lawnmower would have less maintenance and shorter downtime.
- The SRIA analysis used lawn mowers which were not self-propelled and cited self-propelled electric lawn mowers as an advantage. The top ten SORE Best Sellers from Home Depot were all self-propelled. Non-self-propelled options would be less expensive.
- According to the CARB Survey, cost and power were the primary considerations for homeowners' choice in whether to purchase electric equipment.
- According to the new SORE2020 model, CARB expects the electric segment of the residential walk behind mower market to grow from 25% of the market to 30% of the market by 2025.
- Despite the lower power, this is the application most suited to the ZEE transition.

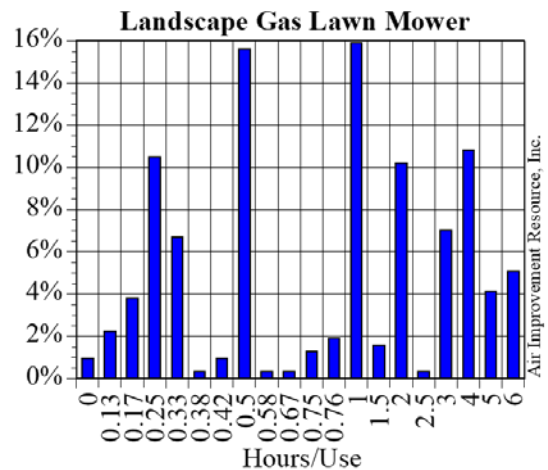
### Professional Walk-Behind Lawn Mowers

The CARB Survey indicates the following professional use listed in the Table (type of mower not specified) with the graph being an alternate view from the AIR analysis:

## From the CARB Survey

Frequency	Licensed Vendors		Unlicensed Vendors	
	# of Mowers	% of Mowers	# of Mowers	% of Mowers
At least once a day	549	54.5%	81	38.4%
At least once a week, but not daily	336	33.3%	93	44.1%
At least once a month, but less than once a week	75	7.4%	25	11.8%
At least once a year but less than once a month	24	2.4%	9	4.3%
Less than once a year	21	2.1%	2	0.9%
Not used <sup>207</sup>	5	0.3%	1	0.5%
<b>Total</b>	<b>1,010<sup>208</sup></b>	<b>100.0%</b>	<b>211</b>	<b>100.0%</b>

## AIR Analysis



Currently, electric lawnmowers occupy less than 3% of the commercial space, according to the CARB Survey. Greater than 25% of commercial mower uses by landscapers are more than three hours in length; almost 40% are more than two hours. Two hours is used as a baseline for the below chart. Note that the costs in the graph reflect only the battery power the mower is sold with. Additional batteries would need to be purchased, charged, and kept on hand at a worksite to provide a full day of mowing without downtime for recharging (as noted in Table C4 above).

The points for gas equipment indicate peak power in kW. Since SORE equipment does not always run at peak power, the blue dashed line on the graphs takes load factor into consideration. The line represents the average of the peak power for the equipment shown, multiplied by the average load factor (as provided by the EMA manufacturers). This is the power required for ZEE to have equivalent operating power as SORE equipment. Battery powered equipment is not advertised by peak power, but rather by battery capacity, as indicated by a combination of Voltage and Capacity in Amp Hours. From this information, the capacity in kWhr can be determined. The points on the graph are battery capacity over the given time period, in the case of professional mowers, 2 hours. This is the maximum power the battery can sustain for the given time period. As the graph shows, ZEE mowers' peak power does not meet the SORE mowers average power output. Figure 3 shows cutting width, an important feature for mowing time.

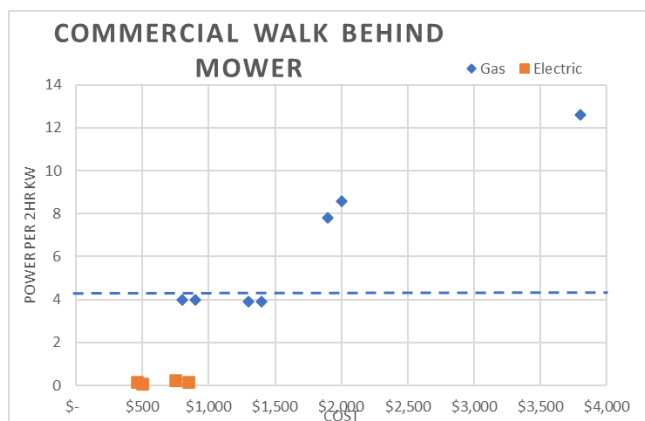


Figure 2. Power vs. Cost for Commercial Walk Behind Mowers

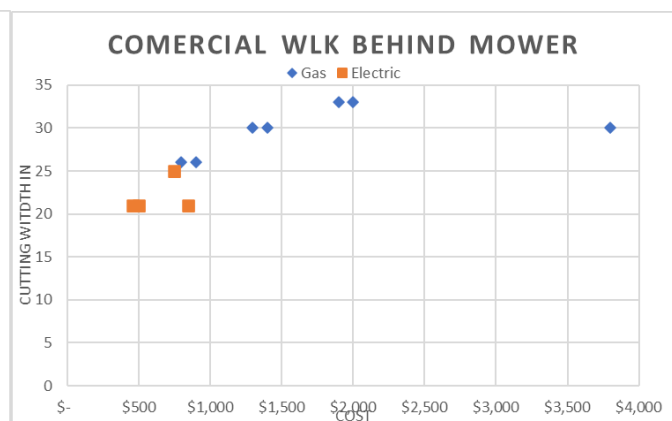


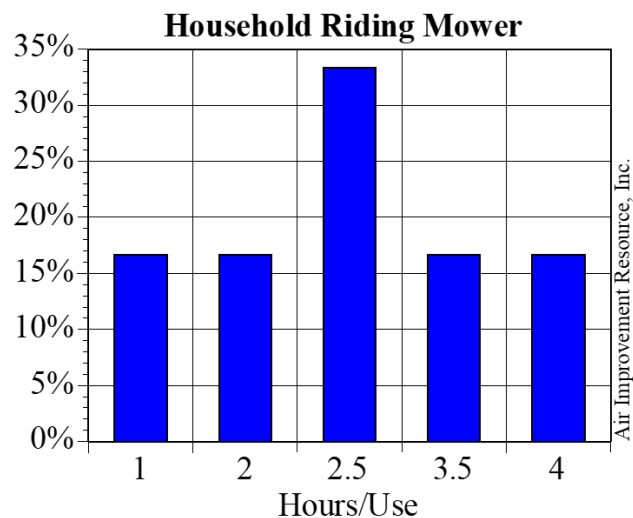
Figure 3. Cutting Width vs. Cost for Commercial Walk Behind

## Notes:

- ▶ While battery-powered mowers are less expensive than commercial gas-powered mowers, their capability is a small fraction of the power of gasoline mowers.
- ▶ Survey information is somewhat skewed due to the generic title of “lawn mower” in the CARB Survey.
- ▶ No battery-powered mowers currently on the market come near meeting SORE average capability (blue dashed line).
- ▶ Often, what might be labeled a “commercial” electric lawnmower is closer in cutting width, style, and capability to that of a residential walk behind mower (see Figure 3 showing cutting width). While there are no set standards for commercial versus residential equipment, commercial equipment generally has a wider cutting width for larger mowing areas and are more capable of cutting tall, wet grass.
- ▶ According to manufacturers, electric lawn mowers are not capable of cutting wet, tall, or thick grass, which are the typical conditions under which commercial mowers are used.
- ▶ Current battery capacities are not capable of the time required for commercial lawn mowing.
- ▶ Even if vendors could charge batteries between lawns, they would have to charge them using their vehicle (which runs on petroleum fuel) or a generator (which also runs on gas), which have emissions associated with their use.
- ▶ If the mowers were equipped with more batteries for longer run times, the weight of the mower would become an issue, as mowers are taken in and out of trucks at each jobsite.
- ▶ Having multiple batteries for use over the course of a day would be expensive: currently replacement batteries for mowers can cost \$150-\$300 each.
- ▶ Survey respondents (vendors) indicated that power and run time were the most important factors in whether to choose electric equipment.

## Residential Lawn Tractors

According to the CARB survey, 0% of Californians own an electric lawn tractor. Based on data from the CARB Survey Report, this graph by AIR shows over 75% of uses are 2 hours or more and over 30% are 3.5 hours or more. Two hours is used for the purpose of this analysis.



Household Use from AIR Analysis

The points on the graph below (Figure 4) for gas equipment indicate peak power in kW. Since SORE equipment does not always run at peak power, the blue dashed line on the graphs takes load factor into consideration. The line represents the average of the peak power for the equipment shown, multiplied by the average load factor (as provided by the EMA manufacturers). This is the power required for ZEE to have equivalent operating power as SORE equipment. Battery powered equipment is not advertised by peak power, but rather by battery capacity, as indicated by a combination of Voltage and Capacity in Amp Hours. From this information, the capacity in kWhr can be determined. The points on the graph are battery capacity over the given time period, in the case of residential lawn tractors, 2 hours. This is the maximum power the battery can sustain for the given time period. As the graph shows, ZEE mowers' peak power does not meet the SORE mowers average power output.

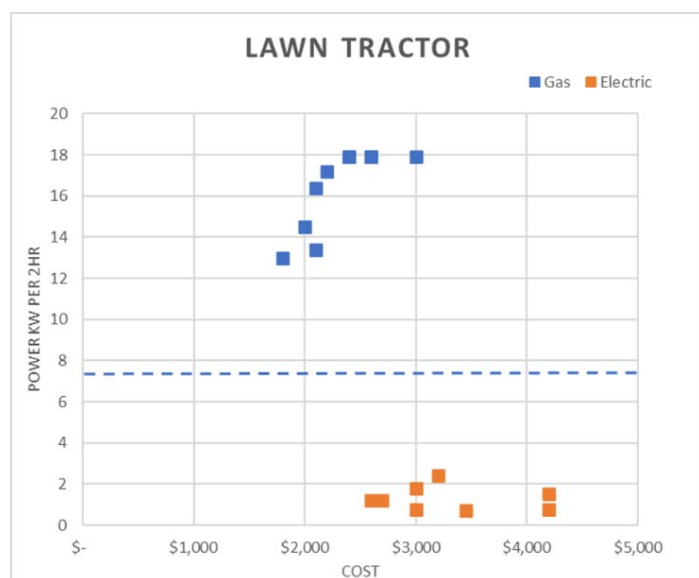


Figure 4. Power vs. Cost for Lawn Tractors

#### Notes:

- ▶ While a riding lawn mower may have more room for batteries, added weight means the batteries have to work harder to move the tractor.
- ▶ While the 1-2 acre capability of these lawn tractors is enough for most residential customers, they do not have replaceable batteries for additional running time, and the whole tractor must be plugged in to recharge, which takes an average of 4 hours.
- ▶ According to manufacturers, sales of lawn tractors are declining as consumers opt for ZTR mowers instead.
- ▶ According to manufacturers, 30% of lawn tractor owners lack available power in storage sheds or barns.

### Professional Riding Lawn Mowers – ZTR Mowers

In the market place, professional riding lawn mowers are all Zero-Turn-Radius (ZTR) mowers, so ZTR mowers are exclusively used for this category. The CARB Survey, however, does not specify the type of mower, so the same data is used for both walk-behind and riding mowers:



## From CARB Survey

Table 202. Frequency of Lawn Mower Usage by Licensed and Unlicensed Vendors				
	Licensed Vendors		Unlicensed Vendors	
Frequency	# of Mowers	% of Mowers	# of Mowers	% of Mowers
At least once a day	549	54.5%	81	38.4%
At least once a week, but not daily	336	33.3%	93	44.1%
At least once a month, but less than once a week	75	7.4%	25	11.8%
At least once a year but less than once a month	24	2.4%	9	4.3%
Less than once a year	21	2.1%	2	0.9%
Not used <sup>207</sup>	5	0.3%	1	0.5%
Total	1,010 <sup>208</sup>	100.0%	211	100.0%

## AIR Analysis

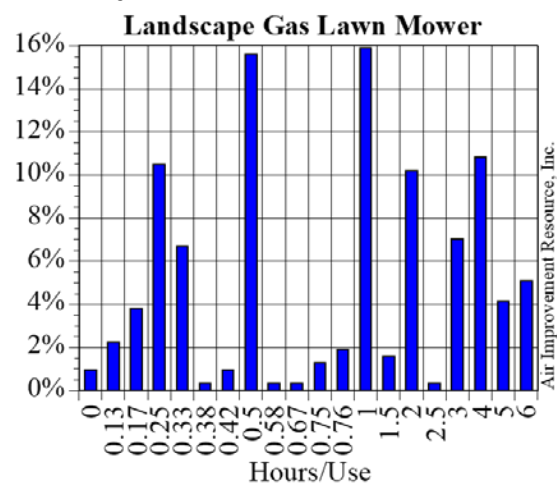


Table and Data from the CARB Survey Report (type of mower not specified), graph by AIR

Currently, electric lawnmowers occupy less than 3% of the commercial space, according to the CARB Survey. Over 25% of commercial mower uses by landscapers are more than 3 hours in length; almost 40% are more than 2 hours. Two hours is used for the graph below, although the most expensive battery-powered options can run all day.

The points for gas equipment indicate peak power in kW. Since SORE equipment does not always run at peak power, the blue dashed line on the graphs takes load factor into consideration. The line represents the average of the peak power for the equipment shown, multiplied by the average load factor (as provided by the EMA manufacturers). This is the power required for ZEE to have equivalent operating power as SORE equipment. Battery powered equipment is not advertised by peak power, but rather by battery capacity, as indicated by a combination of Voltage and Capacity in Amp Hours. From this information, the capacity in kWhr can be determined. The points on the graph are battery capacity over the given time period, in the case of professional ZTR mowers, 2 hours. This is the maximum power the battery can sustain for the given time period. As the graph shows, ZEE mowers' peak power does not meet the SORE mowers average power output.

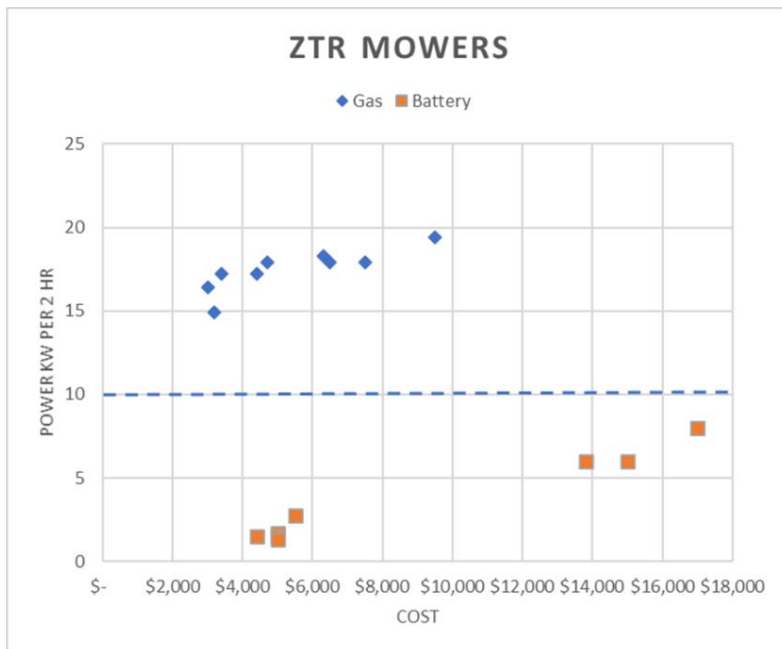


Figure 5. Power vs. Cost for ZTR Mowers

## Notes:

- ▶ ZTR mowers are popular among commercial landscapers for their high power capability and maneuverability.
- ▶ Battery-powered ZTR mowers that can last a full work-day are available from one manufacturer (see graph) but at 2-3 times the cost, making them prohibitively expensive. The power on these machines is also 2-3 times less, providing less value for the cost.
- ▶ Many ZTR's don't have replaceable batteries for additional run time, so the whole tractor must be plugged in to charge, which takes approximately 4 hours, according to product specifications. For practical purposes, this means only one use of these equipment per day, since charging time (if a method of charging is available), would take the rest of the shift.
- ▶ ZTRs aren't specified in the CARB survey specifically; however, fewer than 3% of the total vendor lawn mower count is electric so one could conclude that few, if any, lawn services use electric ZTR mowers.
- ▶ According to manufacturers, an electric lawnmower would have less maintenance and shorter downtime.
- ▶ According to manufacturers, an electric lawn mower cannot cut tall, thick, or wet grass.
- ▶ Manufacturers estimate that a competitive battery that can provide a useful amount of run time for ZTR mowers is 7-10 years away. The ones currently available that can run for a full shift are prohibitively expensive.
- ▶ Only one brand of battery-powered ZTR is capable of the time required for commercial lawn mowing.
- ▶ Even if vendors could charge batteries between lawns, they would have to charge them using their vehicle (which runs on petroleum fuel) or a generator (which also runs on gas), either of which have emissions associated with running. Currently available ZEE power stations do not have the capacity to fully charge a ZTR mower.
- ▶ If the mowers were equipped with more batteries for longer run times, the weight of the mower would become an issue, as mowers are taken in and out of trucks at each jobsite.
- ▶ Having multiple batteries for use over the course of a day would be expensive: currently replacement batteries can cost \$200-\$400 each (for the few models with replaceable batteries)

- Survey respondents (vendors) indicated that power and run time were the most important factors in deciding whether to choose electric equipment.

## Residential Pressure Washers

According to the CARB Survey, residential pressure washer usage is as follows:

Figure 16. Power Type of Pressure Washers Owned by Households

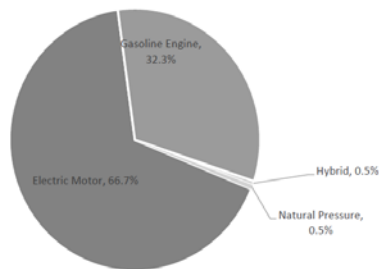


Figure 17. Presence of Cord for Electric Pressure Washers Owned by Households

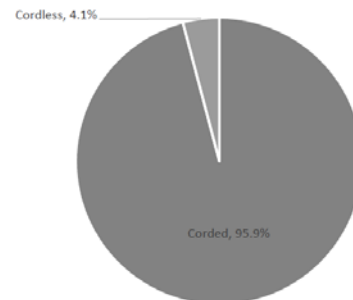
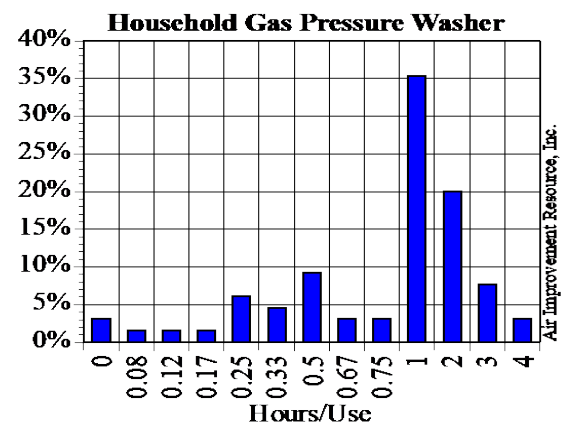


Table from CARB Survey

Frequency Used	# of Pressure Washers	% of Pressure Washers
Not used	9	4.2%
Less than four times per year	104	48.1%
Four to 11 times per year	39	18.1%
Twelve to 24 times per year	45	20.8%
25 to 51 times per year	5	2.3%
52 times per year	10	4.6%
More than 52 times per year	4	1.9%
<b>Total</b>	<b>216</b>	<b>100.0%</b>

Analysis by AIR



70% of residential users say they use their pressure washer for an hour or more per use. An hour is used in this analysis.

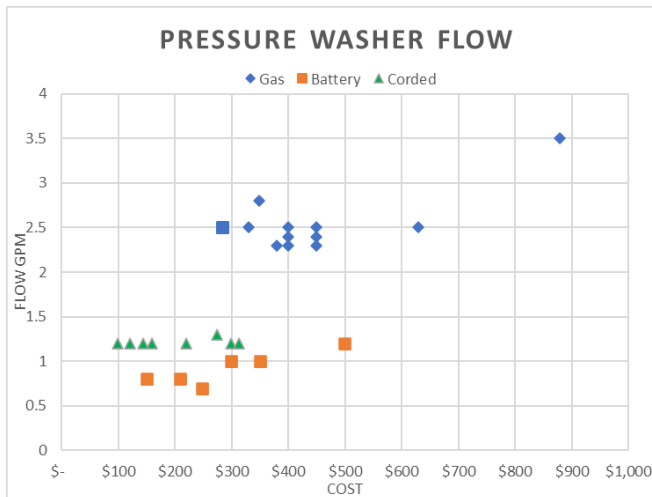


Figure 6. Flow vs. Cost for Residential Pressure Washers

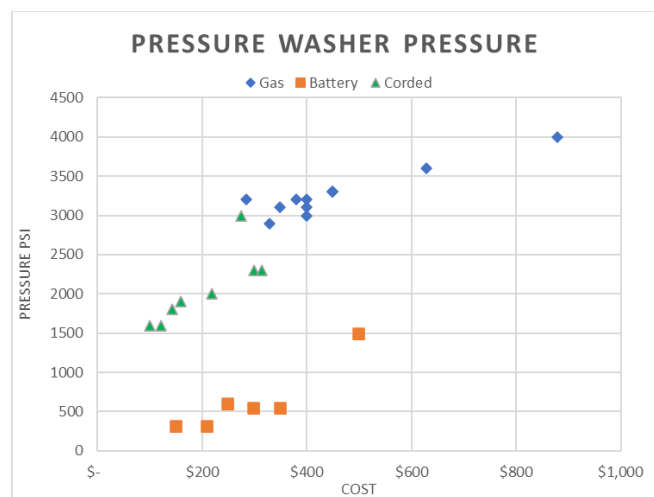


Figure 7. Pressure vs. Cost for Residential Pressure Washers

Pressure and Flow are the primary characteristics of pressure washers. Electric pressure washers have lower flow and pressure than that of SORE pressure washers, by at least half.

The points for gas equipment in Figure 8 below, indicate peak power in kW. Since SORE equipment does not always run at peak power, the blue dashed line on the graphs takes load factor into consideration. The line represents the average of the peak power for the equipment shown, multiplied by the average load factor (as provided by the EMA manufacturers). This is the power required for ZEE to have equivalent operating power as SORE equipment. Battery powered equipment is not advertised by peak power, but rather by battery capacity, as indicated by a combination of Voltage and Capacity in Amp Hours. From this information, the capacity in kWhr can be determined. The points on the graph are battery capacity over the given time period, in the case of residential pressure washers, 1 hour. This is the maximum power the battery can sustain for the given time period. As the graph shows, ZEE pressure washers' peak power does not meet the SORE pressure washers' average power output. Corded Electric equipment is also shown at peak advertised power.

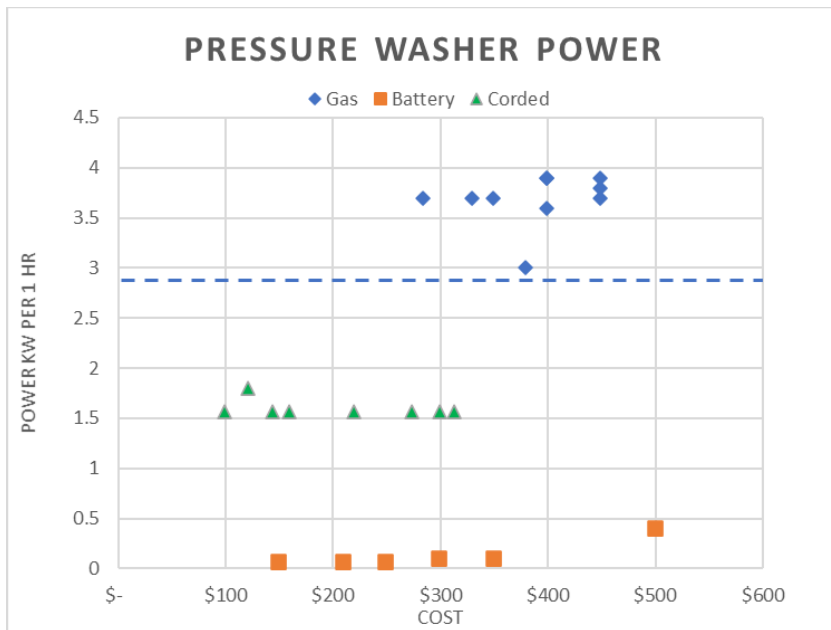


Figure 8. Power vs. Cost for Residential Pressure Washers

**Notes:**

- ▶ Residential use is primarily corded electric (>90%) as they are relatively inexpensive and readily available.
- ▶ Battery-powered options have very low capability over average time of use.
- ▶ A battery-powered version would also need additional waterproofing to protect the battery and the operator.

**Professional Pressure Washers**

For the purpose of this analysis, professional pressure washers are defined as those having pressure capability of at least 3500psi. No battery electric pressure washers with this pressure capability currently exist in the marketplace. There is one corded electric option available at 3500psi.

According to the CARB Survey, professional pressure washer usage is as follows:

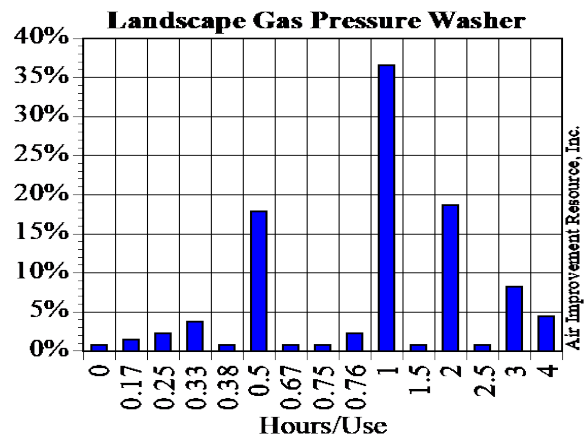
Table 256. Power Type of Pressure Washers Used by Licensed and Unlicensed Vendors				
Power Type	Licensed Vendors		Unlicensed Vendors	
	# of Washers	% of Washers	# of Washers	% of Washers
Gas Powered	122	81.9%	32	84.2%
Electric Powered	27	18.1%	6	15.8%
Total	149	100.0%	38	100.0%

Table 257. Corded/Cordless Pressure Washers Used by Licensed and Unlicensed Vendors				
Licensed Vendors			Unlicensed Vendors	
Corded/Cordless	# of Washers	% of Washers	# of Washers	% of Washers
Corded	26	96.3%	5	83.3%
Cordless	1	3.7%	1	16.7%
Total	27	100.0%	6	100.0%

From CARB Survey

Table 258. Frequency of Pressure Washer Usage by Licensed and Unlicensed Vendors				
Licensed Vendors			Unlicensed Vendors	
Frequency	# of Washers	% of Washers	# of Washers	% of Washers
At least once a week, but not daily	25	16.8%	1	2.7%
At least once a month, but less than once a week	63	42.3%	15	40.5%
At least once a year but less than once a month	61	40.9%	20	54.1%
Less than once a year	0	0.0%	0	0.0%
Did not use	0	0.0%	1	2.7%
Total	149 <sup>270</sup>	100.0%	37	100.0%

AIR Analysis



The graph from AIR provides an alternate view of the CARB Survey data. 70% of users say they use their pressure washer for an hour or more per use.

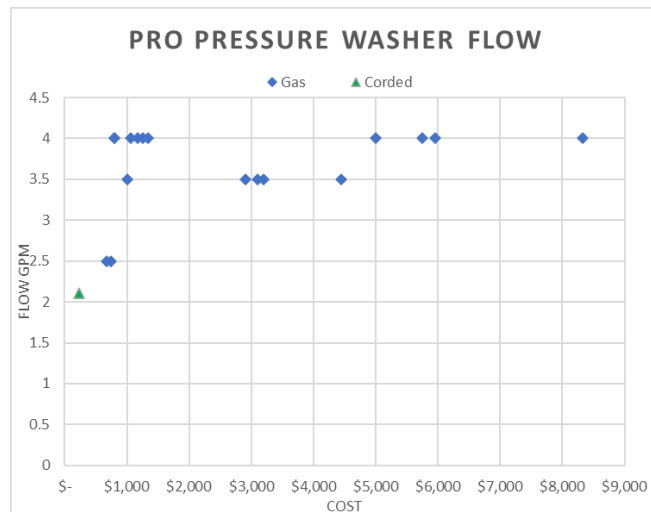


Figure 9. Flow vs. Cost for Professional Pressure Washers

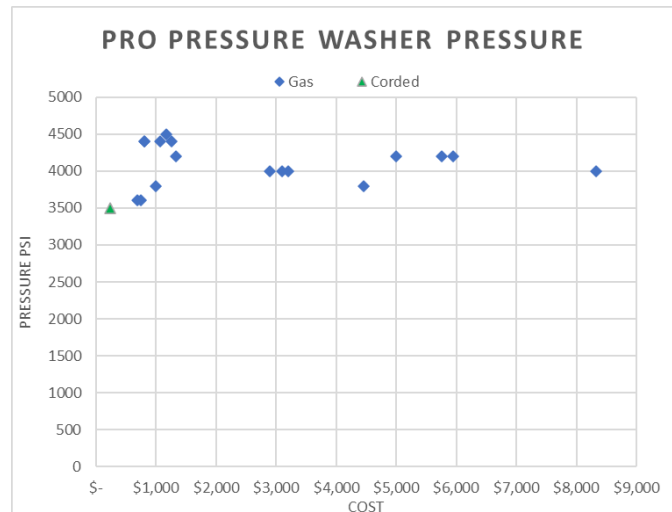


Figure 10. Pressure vs. Cost for Professional Pressure Washers

The points for gas equipment and corded electric equipment in Figure 11 below, indicate peak power in kW. Battery powered pressure washers with professional capability are not available in the marketplace.

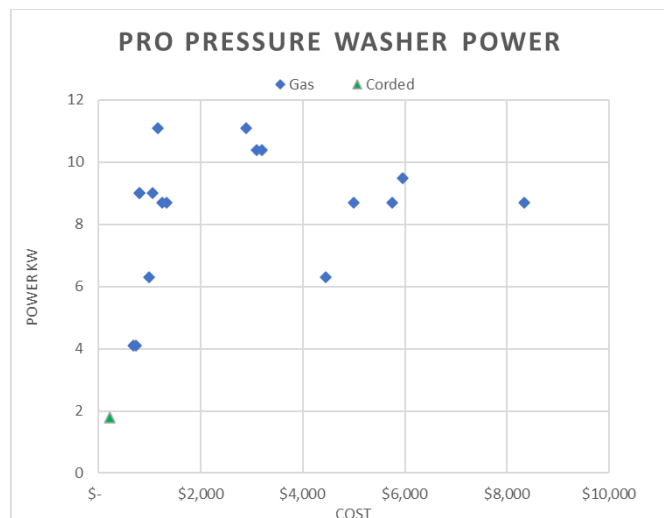


Figure 11. Power vs. Cost for Professional Pressure Washers

## Notes:

- ▶ Gas-powered pressure washers are more expensive but have higher capability and are more easily portable; therefore, they are used primarily by commercial entities.
- ▶ Professional pressure washers require not only greater flow and pressure than electric applications can provide, but because they are being used consistently for commercial work, instead of intermittently for residential use, average time of use is crucial for commercial power washers. This challenges the development of battery powered pressure washers with professional level capability.
- ▶ A battery-powered version would also need additional waterproofing to protect the battery and the operator.

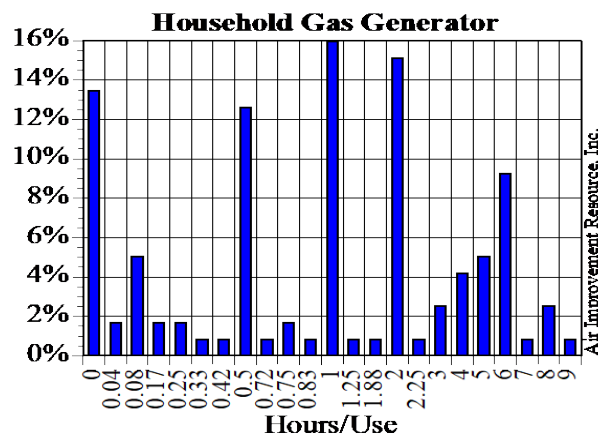
## Portable Generators

Generators for residential use include back up power, in the case of a power outage, tailgate, camping or on Recreational Vehicles. Professionals are likely to use generators for auxiliary power on a jobsite. The same options are available for both, but it is assumed that professionals are likely to use them for a greater number of hours per year.

According to the CARB Survey, portable generators for Residential use is as follows, with analysis by AIR:

**Table 50. Frequency of Generator Usage by Households per Year**

Frequency Used	# of Generators	% of Generators
Not used	26	16.6%
Less than four times per year	79	50.3%
Four to 11 times per year	22	14.0%
Twelve to 24 times per year	13	8.3%
25 to 51 times per year	4	2.5%
52 times per year	4	2.5%
More than 52 times per year	9	5.7%
<b>Total</b>	<b>157</b>	<b>100.0%</b>



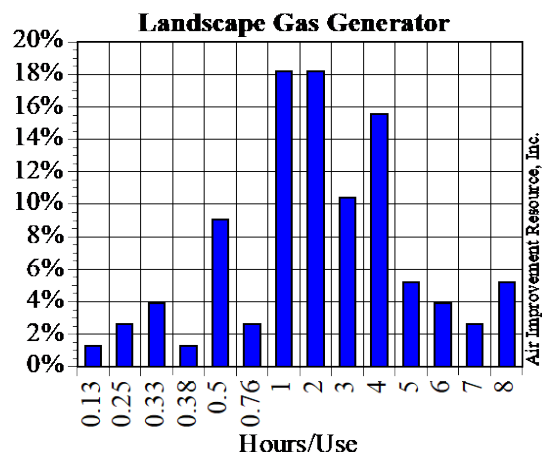
42% of generators uses are 2 hours or longer; over 10% of uses are 6 hours or longer.

For Professional generator use, the Survey said the following:

From CARB Survey

Frequency	Licensed Vendors		Unlicensed Vendors	
	# of Generators	% of Generators	# of Generators	% of Generators
At least once a day	0	0.0%	0	0.0%
At least once a week, but not daily	23	24.0%	0	0.0%
At least once a month, but less than once a week	29	30.2%	1	7.1%
At least once a year but less than once a month	40	41.7%	11	78.6%
Less than once a year	3	3.1%	0	0.0%
Did not use	1	1.0%	2	14.3%
Total	96 <sup>2021</sup>	100%	14	100%

AIR Analysis



For professionals, 78% of uses are longer than 1 hour, 60% of uses are longer than 2 hours, over 10% are 6 hours or more.

The points for gas equipment in Figure 12 below indicate peak power in kW. Battery powered equipment is not advertised by peak power, but rather by battery capacity, as indicated by a combination of Voltage and Capacity in Amp Hours. From this information, the capacity in kWhr can be determined and are shown in the graph below. When this capacity is expended, the ZEE generator must be recharged from another power source.

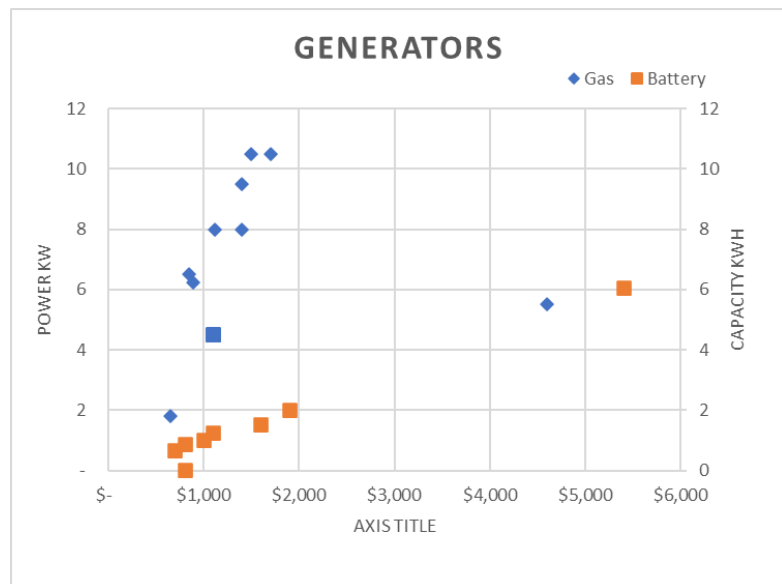


Figure 12. Power vs. Cost for Portable Generators



## Notes:

- ▶ Many gas-powered generators are referred to as “electric” on Home Depot or other websites as they use a battery starter.
- ▶ Most truly “electric generators” or battery banks that exist in the marketplace have low capacity and are intended for recreational purposes. Gas-powered portable generators are used on job sites, for back-up home power, or on RVs.
- ▶ In 2019, almost 2 million Californians were without power for 7 days due to utility blackouts.
- ▶ While CARB staff indicated in the June 9 Workshop that they expect homeowners interested in backup power to have generators that are greater than 25hp, this position is inconsistent with the survey results of the population of portable generators for residential use.
  - Approximately 10% of households surveyed had a generator under 25hp.
- ▶ While there are battery banks that fall in the same price range as gas-powered generators, they have significantly less capability.
  - A gas generator can run appliances while a battery can run only small electronics.
- ▶ Generators used to provide back up or job-site power cannot be replaced with the battery banks currently on the market.
- ▶ The biggest limitation of a battery bank is that once the battery is drained, it must be connected to a source of electricity to be recharged – in the event of a power outage lasting more than one hour, this is not possible (78% of uses are >1hr). A gas generator can run indefinitely as long as it is refueled.
- ▶ Given the lack of dependable electricity during forest fire season, residents need access to small gas generators to provide power for essential items such as refrigerators and medical equipment, including oxygen and CPAP machines.
- ▶ The one large battery option, which is not portable but a permanent installation, is the Tesla Powerwall. It is prohibitively expensive for the majority of homeowners (not shown in the chart).
  - At 13.5kWh (5kW continuous power), 2 would be needed to power an entire average sized home for 1 day. 3 are needed if one also wants to charge an electric vehicle.
  - On limited use, this product could last through a multi-day power outage.
  - The cost of 2 Powerwalls plus installation is approximately \$20,000 (installation costs vary).

## Residential Pumps

Utility equipment incorporates a broad range of products that the agency may be preempted by federal law from regulating. Engine manufacturers do not always make the equipment as well as the engine in this category. Often, engine manufacturers are selling loose engines to be used in a variety of equipment made by different manufacturers. This complicates regulatory requirements. Given the lack of data in the CARB survey, we have focused on pumps <2hp as they are included specifically in the SRIA. This analysis considers pumps under 2hp as used in Residential applications.

The points for gas equipment in Figure 13 below indicate peak power in kW. Since SORE equipment does not always run at peak power, the blue dashed line on the graphs takes load factor into consideration. The line represents the average of the peak power for the equipment shown, multiplied by the average load factor (as provided by the EMA manufacturers). This is the power required for ZEE to have equivalent operating power as SORE equipment. Battery powered pumps and corded electric pumps are advertised with peak power output so for ZEE pumps, peak power is shown as well. As the graph shows, ZEE pumps' peak power does not meet the SORE pumps average power output.

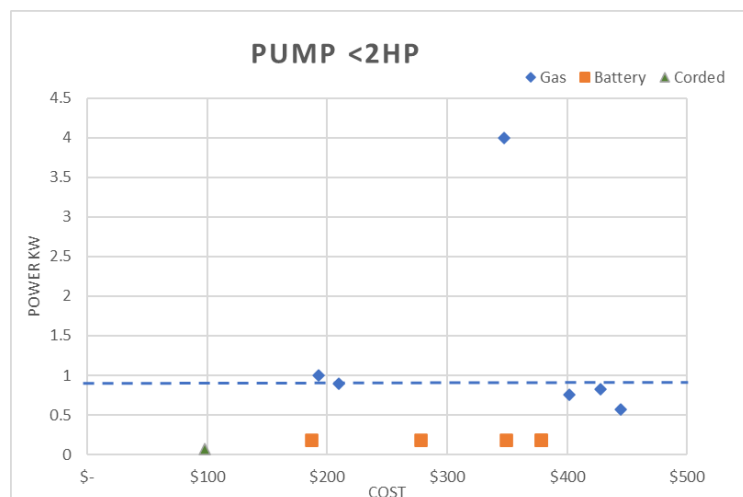


Figure 13: Power vs Cost for Residential Pumps

The small pump market includes both corded and battery electric options. While CARB is focused on battery powered equipment, there are some applications for which a corded option would be more appropriate – for example, in a continuous use application such as a fountain or sump pump. A battery powered option could be useful for a temporary application where portability is advantageous. Still, the battery pumps are lower powered than the gas options.

## Professional Pumps

Utility equipment incorporates a broad range of products that the agency may be preempted by federal law from regulating. Engine manufacturers do not always make the equipment as well as the engine in this category. Often, engine manufacturers are selling loose engines to be used in a variety of equipment made by different manufacturers. This complicates regulatory requirements. CARB's analysis focused only on pumps <2hp. This analysis looks at pumps >2 hp and up to 7hp for professional use (note that the most popular pumps were all 7hp or below).

The points for gas equipment in Figure 14 below indicate peak power in kW. Since SORE equipment does not always run at peak power, the blue dashed line on the graphs takes load factor into consideration. The line represents the average of the peak power for the equipment shown, multiplied by the average load factor (as provided by the EMA manufacturers). This is the power required for ZEE to have equivalent operating power as SORE equipment. Battery powered pumps and corded electric pumps are advertised with peak power output so for ZEE pumps, peak power is shown as well. As the graph shows, battery powered ZEE pumps' peak power does not meet the SORE pumps average power output.

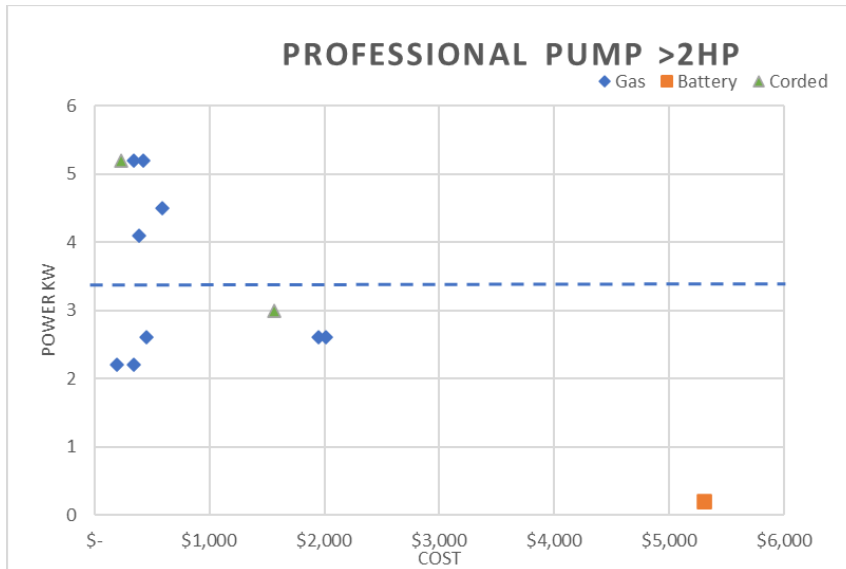


Figure 14: Power vs Cost for Professional Pumps

No battery powered pumps above 2hp are available. One professional battery-powered pump is shown here, and even for the \$5,000+ price tag, it provides less than 1hp. Corded options are in the price and power range of gas-powered models. This is another application where corded options may be more appropriate for pump applications given the current capability of today's batteries.

## **SRIA Claims**

### **ZEE is More Durable than SORE Equipment**

The SRIA claims that a benefit of ZEE is that it's more durable than SORE equipment. It is unclear whether this is actually true or not. Since battery powered equipment has been in the marketplace for a relatively short period of time, it is difficult to judge long term durability. Fewer moving parts are cited as a reason for reduced durability – the more things move, the more likely they are to fail. This may be true, but per CARB's own regulations, SORE must be emissions compliant (meaning they must work and perform as designed) for a given Useful Life – up to 1000 hours for Class II equipment. The fact that CARB wants to increase the certification Useful Life based on data they have indicating SORE equipment lasts longer than the current certified Useful Life, proves that SORE equipment has high durability. CARB did not provide data to indicate the durability of battery powered equipment.

Currently, a robust repair market exists for SORE equipment, and engines can usually be fixed with small component replacements. Whereas with ZEE, motor burnout is the most likely failure, in which case, most consumers will simply buy new equipment resulting in waste of the broken equipment since the motor is the most expensive part.

Another way to consider this is with equipment warranties. Both SORE and ZEE lawn mowers and pressure washers have equipment warranties lasting 2-5 years depending on the manufacturer. Presumably, if manufacturers thought that ZEE would last longer, they would offer a longer warranty period.

### **ZEE Batteries Outlive ZEE**

Similarly, the SRIA claims that ZEE batteries will outlive the equipment, allowing consumers to purchase the tool only and continue using their current batteries. Again, CARB did not provide any data to back up this claim. Given the short history of battery powered lawn and garden equipment, it is difficult to definitively say whether or not this claim is accurate. However, in looking at manufacturer warranties, many offer longer warranties for the equipment than the batteries. For example, Ryobi, a popular, low-cost ZEE option, offers five years for its equipment vs three years for the battery. Other manufacturers offer similar warranties. It seems unlikely that manufacturers would offer a longer warranty for the equipment if the equipment was not expected to last as long as the battery.

Batteries for professional users are very unlikely to outlive the equipment because they will be subjected to daily (or more) charges and discharges, and battery life is based on the number of charges/discharges it sees. CARB has suggested professionals will also use a ZEE generator, or power station, to recharge batteries for other ZEE equipment during the day, so that it is not necessary to purchase extra batteries. Multiple charges and discharges on these batteries will decrease life, requiring owners to purchase replacement batteries during the life of the equipment. Common estimates for battery life in terms of charges/discharges is approximately 500; if professionals are using two full charges per day of batteries for common equipment such as walk behind lawn mowers, these batteries will only last a few years. Either extra batteries must be purchased up front or they will need to be replaced mid-life. Furthermore, primary, and any additional batteries, will be subjected to wear and tear from rolling around in the back of trucks/trailers and being exposed to rain/dirt/mud while in use. In these conditions, it is unlikely batteries will maintain their expected useful life. So far from being able to use batteries beyond the life of the equipment, professionals are likely to have to replace batteries more frequently.

## **ZEE Batteries are Interchangeable**

The SRIA claims that ZEE batteries are interchangeable and therefore convenient for owners to swap batteries to whichever piece of equipment needs it. This is certainly true for handheld equipment and brand-standard size batteries for handheld equipment are readily available. In fact, equipment is advertised, or sold in packages to encourage homeowners and professionals to purchase equipment of all one brand such that the batteries can be used in any device. This remains true for non-handheld equipment which runs on 18V, 4Ah batteries, which can be found in some small residential mowers, pressure washers and other equipment. These are often specifically designed to swap batteries with some handheld equipment such as leaf blowers and string trimmers. Although, even if batteries are interchangeable, once they have been used, they need to be recharged so a homeowner or professional who wishes to use more than one piece of equipment during a given time period, will still need multiple batteries.

For most non-handheld equipment, there is less commonality, for several reasons. Batteries for ground-supported equipment are generally 40V or more and are specifically designed for that piece of equipment based on the size of the equipment they go in and the expected usage of that equipment. The compact nature of lawn and garden equipment makes interchangeable design challenging. Some large equipment such as ZTR mowers and Lawn Tractors have batteries which are not removable for recharging or replacing. In those cases, the whole machine must be plugged in, similar to an electric vehicle, for charging, which takes hours. Additionally, fewer options for non-handheld battery ZEE are available, particularly in the professional space, resulting in fewer options for commonality. Similarly, there are fewer brands which make professional equipment, and they don't necessarily make all kinds of ZEE.

## **Snow Blower Usage**

CARB claims in the SRIA that ZEE snow blowers are less expensive than gas powered versions and have interchangeable batteries. While Ryobi does make 18" and 21" snow blowers that run on the same 40V batteries as their residential lawn mower, these models are priced similarly to their gas-powered counterparts. Two-stage electric models are similarly priced to two-stage gasoline models as well, but do not have batteries which are interchangeable with other products. Based on the analysis provided here, as well as the consumer feedback from CARB's ZEE Roadshow, it is highly unlikely that consumers would find that electric snow blowers perform on par with SORE snowblowers, as the SRIA claims.

The SRIA also states that snow blowers have engines smaller than 825cc and would therefore not be subject to the more stringent CO standard being proposed. This appears to be generally true.

## **Pressure Washer Usage**

The SRIA claims that the pressure washer market, like other equipment will tend towards battery powered ZEE, rather than the currently available and widely used corded electric equipment. Over 90% of residential pressure washers are corded electric. Particularly in the residential market, there seems to be no reason not to accept corded electric pressure washers as they have higher power than current battery powered models (see Utility graphs) and are less expensive. While there are some battery models which share batteries with other equipment (such as Ryobi), these models are particularly low powered.

For the professional market, where higher pressure and flow is required, no battery powered models exist and the corded electric models have much lower capability than gas-powered versions. According to manufacturers, it is unlikely that battery powered versions with professional-level capability will be available

in the next two years. It may be possible to develop corded versions with higher power, but as the SRIA notes, on a remote site, these would need to be plugged into a generator. CARB suggests these would be ZEE generators, but it is unclear whether a ZEE generator (of which there are few high capacity options) would be able to power a high-pressure, high-flow professional grade pressure washer for the needed length of time. According to the CARB survey, 70% of professional uses of pressure washers are over an hour long, with 20% being over 2.5 hours.

## Generator Usage

As the SRIA acknowledges, ZEE generators have not been developed to provide the type of power consumers and professionals are currently using portable generators for. Current battery banks have limited capacity and can only provide power for short periods of time before they must be recharged. This may not be a problem in a recreational situation, but is highly problematic when being used as back-up power. While the SRIA indicates that the proposed regulations are not intended for stationary generators permanently installed to provide back-up power in the case of power outages, the CARB survey indicates 10% of Californians own a portable generator under 25hp which they use as emergency back-up power. During 2019, 2 million Californians were without power for over seven days, throughout which time, current battery systems would not be able to provide power for essential items such as refrigerators and medical equipment. The SRIA notes that many battery systems have solar panels to provide additional power. These may be somewhat useful in the event of a Public Safety Power Shutoff (PSPS), although, the high winds that necessitate the PSPS may preclude their use; and in a storm or wildfire situation, solar panels would certainly not be useful.

Professionals use portable generators to operate power tools on remote job sites where electricity is not available. The SRIA has cited a Yeti Goal Zero power station as the best option for professionals suggesting that purchasing two of them, at a total cost of \$6000 would provide adequate power for their equipment. However, the SRIA has looked at equipment power requirements individually, rather than as a whole. While this power station maybe able to run a circular saw for two hours, that is not the only equipment a contractor will want use that day. In addition to the circular saw, a contractor is likely to want to run a compressor, a jackhammer, and a pressure washer, sometimes simultaneously, to complete at least 8 hours of work. Two Yeti power stations do not have that capacity, and the contractor is likely to run their truck (with an internal combustion engine and associated emissions) to recharge the power station mid-shift. In fact, multiple recharges per day may be necessary while using multiple pieces of equipment for a full day's work. Lawn and garden care professionals would want to use a power station to recharge batteries for all of their equipment. Depending on the needs, the power station capacity may not be sufficient to recharge all of the equipment in between jobs. At a price point of \$6000 for two Yeti power stations vs ~\$1000 for a SORE generator which is easily refueled in a couple of minutes from a portable gas container, professionals are unlikely to choose the power station until they are forced to.

The SRIA cites a \$12,000 marine generator as the only SORE generator which meets the MY2024-MY2027 emissions standards, and claims that rather than reduce emissions from currently available SORE generators, manufacturers may simply transition to producing ZEE generators instead. Manufacturers, however, indicate that it will be more technically and economically feasible to produce a compliant SORE generator (which costs less than \$12,000) than develop high-capacity battery power stations. In the event that manufacturers choose not to produce compliant generators, professionals may also opt for diesel or propane powered generators instead. As with SORE, diesel and propane generators are higher-powered and have unlimited use (provided they are refueled).

**APPENDIX A**

## Section G Tables

**Table G-1. Residential Walk Behind Lawn Mowers used in the economic analysis.**

<b>Make and model of equipment</b>	<b>Power Type</b>	<b>Price used in analysis</b>	<b>Citation (Web links last accessed in November 2021)</b>
<b>Honda HRN216VKA</b>	Gas	\$ 419	<a href="https://www.homedepot.com/p/Honda-21-in-3-in-1-Variable-Speed-Gas-Walk-Behind-Self-Propelled-Lawn-Mower-with-Auto-Choke-HRN216VKA/308910379">https://www.homedepot.com/p/Honda-21-in-3-in-1-Variable-Speed-Gas-Walk-Behind-Self-Propelled-Lawn-Mower-with-Auto-Choke-HRN216VKA/308910379</a>
<b>Toro 21352,TB200</b>	Gas	\$ 329	<a href="https://www.homedepot.com/p/Toro-Recycler-21-in-Briggs-and-Stratton-Low-Wheel-RWD-Gas-Walk-Behind-Self-Propelled-Lawn-Mower-with-Bagger-21352/314159908">https://www.homedepot.com/p/Toro-Recycler-21-in-Briggs-and-Stratton-Low-Wheel-RWD-Gas-Walk-Behind-Self-Propelled-Lawn-Mower-with-Bagger-21352/314159908</a>
<b>Toro 21442, 21445, 21378, 21465, 21464 (all same engine)</b>	Gas	\$ 359	<a href="https://www.homedepot.com/p/Toro-22-in-Recycler-Briggs-Stratton-High-Wheel-FWD-Gas-Walk-Behind-Self-Propelled-Lawn-Mower-with-Super-Bagger-21442/317276893">https://www.homedepot.com/p/Toro-22-in-Recycler-Briggs-Stratton-High-Wheel-FWD-Gas-Walk-Behind-Self-Propelled-Lawn-Mower-with-Super-Bagger-21442/317276893</a>
<b>Troy-Bilt TB110, TB100</b>	Gas	\$ 279	<a href="https://www.homedepot.com/p/Troy-Bilt-21-in-140cc-550ex-Series-Briggs-Stratton-Engine-2-in-1-Gas-Walk-Behind-Push-Lawn-Mower-with-High-Rear-Wheels-TB110/306935878">https://www.homedepot.com/p/Troy-Bilt-21-in-140cc-550ex-Series-Briggs-Stratton-Engine-2-in-1-Gas-Walk-Behind-Push-Lawn-Mower-with-High-Rear-Wheels-TB110/306935878</a>
<b>Toro 20339</b>	Gas	\$ 399	<a href="https://www.homedepot.com/p/Toro-Recycler-22-in-SmartStow-High-Wheel-Variable-Speed-Walk-Behind-Gas-Self-Propelled-Mower-20339/205026227">https://www.homedepot.com/p/Toro-Recycler-22-in-SmartStow-High-Wheel-Variable-Speed-Walk-Behind-Gas-Self-Propelled-Mower-20339/205026227</a>
<b>Honda HRX217HYA</b>	Gas	\$ 779	<a href="https://www.homedepot.com/p/Honda-21-in-Nexite-Deck-Hydrostatic-Cruise-Control-Gas-Walk-Behind-Self-Propelled-Mower-with-Blade-Stop-HRX217HYA/314013204">https://www.homedepot.com/p/Honda-21-in-Nexite-Deck-Hydrostatic-Cruise-Control-Gas-Walk-Behind-Self-Propelled-Mower-with-Blade-Stop-HRX217HYA/314013204</a>
<b>Toro 20379</b>	Gas	\$ 399	<a href="https://www.homedepot.com/p/Toro-22-in-Honda-High-Wheel-Variable-Speed-Gas-Walk-Behind-Self-Propelled-Lawn-Mower-20379/304584299">https://www.homedepot.com/p/Toro-22-in-Honda-High-Wheel-Variable-Speed-Gas-Walk-Behind-Self-Propelled-Lawn-Mower-20379/304584299</a>
<b>Yardmax YG1650</b>	Gas	\$ 214	<a href="https://www.homedepot.com/p/YARDMAX-21-in-170cc-OHV-Walk-Behind-Gas-Push-Mower-3-in-1-Mulch-Side-Discharge-and-Rear-Bag-YG1650/314138390">https://www.homedepot.com/p/YARDMAX-21-in-170cc-OHV-Walk-Behind-Gas-Push-Mower-3-in-1-Mulch-Side-Discharge-and-Rear-Bag-YG1650/314138390</a>
<b>Troy-Bilt TB210</b>	Gas	\$ 360	<a href="https://www.homedepot.com/p/Troy-Bilt-21-in-159-cc-Check-Don-t-Change-Series-Engine-3-in-1-Gas-FWD-Self-Propelled-Lawn-Mower-TB210/308038726">https://www.homedepot.com/p/Troy-Bilt-21-in-159-cc-Check-Don-t-Change-Series-Engine-3-in-1-Gas-FWD-Self-Propelled-Lawn-Mower-TB210/308038726</a>
<b>Ryobi RY401110-Y, Cordless</b>	Electric	\$ 249	<a href="https://www.homedepot.com/p/RYOBI-20-in-40-Volt-Brushless-Lithium-Ion-Cordless-Battery-Walk-Behind-Push-Lawn-Mower-6-0-Ah-Battery-Charger-Included-RY401110-Y/311084745">https://www.homedepot.com/p/RYOBI-20-in-40-Volt-Brushless-Lithium-Ion-Cordless-Battery-Walk-Behind-Push-Lawn-Mower-6-0-Ah-Battery-Charger-Included-RY401110-Y/311084745</a>
<b>Greenworks MO60L424, Cordless</b>	Electric	\$ 479	<a href="https://www.homedepot.com/p/Greenworks-PRO-21-in-60V-Battery-Cordless-Self-Propelled-Walk-Behind-Lawn-Mower-with-2-4-0-Ah-Battery-and-Charger-MO60L424/315447186">https://www.homedepot.com/p/Greenworks-PRO-21-in-60V-Battery-Cordless-Self-Propelled-Walk-Behind-Lawn-Mower-with-2-4-0-Ah-Battery-and-Charger-MO60L424/315447186</a>



<b>Greenworks MO60L427, Cordless</b>	Electric	\$ 599	<a href="https://www.homedepot.com/p/Greenworks-PRO-25-in-60V-Battery-Self-Propelled-Walk-Behind-Lawn-Mower-with-2-4-0-Ah-Batteries-and-Charger-MO60L427/315447054">https://www.homedepot.com/p/Greenworks-PRO-25-in-60V-Battery-Self-Propelled-Walk-Behind-Lawn-Mower-with-2-4-0-Ah-Batteries-and-Charger-MO60L427/315447054</a>
<b>Dewalt DCMWSP244U2, Cordless</b>	Electric	\$ 549	<a href="https://www.homedepot.com/p/DEWALT-21-5-in-20-Volt-MAX-Lithium-Ion-Cordless-Battery-Walk-Behind-Self-Propelled-Mower-DCMWSP244U2/314297685?ITC=AUC-96867-23-12070">https://www.homedepot.com/p/DEWALT-21-5-in-20-Volt-MAX-Lithium-Ion-Cordless-Battery-Walk-Behind-Self-Propelled-Mower-DCMWSP244U2/314297685?ITC=AUC-96867-23-12070</a>
<b>Toro 21466, Cordless</b>	Electric	\$ 569	<a href="https://www.homedepot.com/p/Toro-Recycler-22-in-SmartStow-60-Volt-Max-Lithium-Ion-Cordless-Battery-Walk-Behind-Mower-6-0-Ah-Battery-Charger-Included-21466/314426587">https://www.homedepot.com/p/Toro-Recycler-22-in-SmartStow-60-Volt-Max-Lithium-Ion-Cordless-Battery-Walk-Behind-Mower-6-0-Ah-Battery-Charger-Included-21466/314426587</a>
<b>Ryobi P1180VNM, Cordless</b>	Electric	\$ 229	<a href="https://www.homedepot.com/p/RYOBI-ONE-18V-13-in-Cordless-Battery-Walk-Behind-Push-Lawn-Mower-with-4-0-Ah-Battery-and-Charger-P1180VNM/314468508">https://www.homedepot.com/p/RYOBI-ONE-18V-13-in-Cordless-Battery-Walk-Behind-Push-Lawn-Mower-with-4-0-Ah-Battery-and-Charger-P1180VNM/314468508</a>
<b>Toro 21357, Cordless</b>	Electric	\$ 449	<a href="https://www.homedepot.com/p/Toro-21-in-Recycler-SmartStow-60-Volt-Lithium-Ion-Brushless-Cordless-Battery-Walk-Behind-Mower-RWD-5-0-Ah-w-Battery-Charger-21357/317276851">https://www.homedepot.com/p/Toro-21-in-Recycler-SmartStow-60-Volt-Lithium-Ion-Brushless-Cordless-Battery-Walk-Behind-Mower-RWD-5-0-Ah-w-Battery-Charger-21357/317276851</a>
<b>Greenworks MO60L516, Cordless</b>	Electric	\$ 369	<a href="https://www.homedepot.com/p/Greenworks-PRO-21-in-60V-Battery-Cordless-Push-Lawn-Mower-with-5-0-Ah-Battery-and-Charger-MO60L516/315447190">https://www.homedepot.com/p/Greenworks-PRO-21-in-60V-Battery-Cordless-Push-Lawn-Mower-with-5-0-Ah-Battery-and-Charger-MO60L516/315447190</a>
<b>Makita XML08PT1, Cordless</b>	Electric	\$ 849	<a href="https://www.homedepot.com/p/Makita-21-in-18-Volt-X2-36-Volt-LXT-Lithium-Ion-Cordless-Walk-Behind-Self-Propelled-Lawn-Mower-Kit-with-4-Batteries-5-0-Ah-XML08PT1/312938313">https://www.homedepot.com/p/Makita-21-in-18-Volt-X2-36-Volt-LXT-Lithium-Ion-Cordless-Walk-Behind-Self-Propelled-Lawn-Mower-Kit-with-4-Batteries-5-0-Ah-XML08PT1/312938313</a>
<b>Ryobi P1190VNM, Cordless</b>	Electric	\$ 279	<a href="https://www.homedepot.com/p/RYOBI-ONE-HP-18V-Brushless-16-in-Cordless-Battery-Walk-Behind-Push-Lawn-Mower-with-2-4-0-Ah-Batteries-and-1-Charger-P1190VNM/314600700">https://www.homedepot.com/p/RYOBI-ONE-HP-18V-Brushless-16-in-Cordless-Battery-Walk-Behind-Push-Lawn-Mower-with-2-4-0-Ah-Batteries-and-1-Charger-P1190VNM/314600700</a>

**Table G-2. Commercial Walk Behind Lawn Mowers used in the economic analysis.**

<b>Make and model of equipment</b>	<b>Power Type</b>	<b>Price used in analysis</b>	<b>Citation (Web links last accessed in November 2021)</b>
<b>Toro 21199</b>	Gas	\$ 1,299	<a href="https://www.homedepot.com/p/Toro-TimeMaster-30-in-Briggs-Stratton-Personal-Pace-Self-Propelled-Walk-Behind-Gas-Lawn-Mower-with-Spin-Stop-21199/300234121">https://www.homedepot.com/p/Toro-TimeMaster-30-in-Briggs-Stratton-Personal-Pace-Self-Propelled-Walk-Behind-Gas-Lawn-Mower-with-Spin-Stop-21199/300234121</a>
<b>Dewalt DXGMW33382R</b>	Gas	\$ 1,999	<a href="https://www.homedepot.com/p/DEWALT-DW33-33-in-382-cc-OHV-Electric-Start-Engine-Wide-Area-Gas-Walk-Behind-Lawn-Mower-DXGMW33382R/314730752">https://www.homedepot.com/p/DEWALT-DW33-33-in-382-cc-OHV-Electric-Start-Engine-Wide-Area-Gas-Walk-Behind-Lawn-Mower-DXGMW33382R/314730752</a>
<b>Beast 26FB2M21</b>	Gas	\$ 799	<a href="https://www.homedepot.com/p/Beast-26-in-208-cc-Gas-Walk-Behind-3-In-1-Wide-Area-Self-Propelled-Lawn-Mower-Rear-Wheel-Drive-with-Blade-Brake-Clutch-26FB2M21/316468464">https://www.homedepot.com/p/Beast-26-in-208-cc-Gas-Walk-Behind-3-In-1-Wide-Area-Self-Propelled-Lawn-Mower-Rear-Wheel-Drive-with-Blade-Brake-Clutch-26FB2M21/316468464</a>



<b>Turf Beast 26FB3M21</b>	Gas	\$ 899	<a href="https://www.homedepot.com/p/Turf-Beast-26-in-208-cc-120V-Electric-Start-Walk-Behind-Self-Propelled-Rear-Wheel-Mower-Variable-Speed-Drive-w-Blade-Brake-Clutch-26FB3M21/316468469">https://www.homedepot.com/p/Turf-Beast-26-in-208-cc-120V-Electric-Start-Walk-Behind-Self-Propelled-Rear-Wheel-Mower-Variable-Speed-Drive-w-Blade-Brake-Clutch-26FB3M21/316468469</a>
<b>Toro 21200</b>	Gas	\$ 1,399	<a href="https://www.homedepot.com/p/Toro-TimeMaster-30-in-Briggs-Stratton-Electric-Start-Walk-Behind-Gas-Self-Propelled-Mower-with-Spin-Stop-21200/300887141">https://www.homedepot.com/p/Toro-TimeMaster-30-in-Briggs-Stratton-Electric-Start-Walk-Behind-Gas-Self-Propelled-Mower-with-Spin-Stop-21200/300887141</a>
<b>Generac AT47030GENG</b>	Gas	\$ 3,800	<a href="https://www.homedepot.com/p/Generac-PRO-30-in-18-67-HP-G-Force-Gas-Electric-Start-Self-Propelled-Walk-Behind-Field-and-Brush-Mower-AT47030GENG/312420814">https://www.homedepot.com/p/Generac-PRO-30-in-18-67-HP-G-Force-Gas-Electric-Start-Self-Propelled-Walk-Behind-Field-and-Brush-Mower-AT47030GENG/312420814</a>
<b>Cub Cadet CC800</b>	Gas	\$ 1,899	<a href="https://www.homedepot.com/p/Cub-Cadet-33-in-10-5-HP-Briggs-and-Stratton-Electric-Start-Gas-Engine-Wide-Area-Walk-Behind-Self-Propelled-Lawn-Mower-CC800/314914267">https://www.homedepot.com/p/Cub-Cadet-33-in-10-5-HP-Briggs-and-Stratton-Electric-Start-Gas-Engine-Wide-Area-Walk-Behind-Self-Propelled-Lawn-Mower-CC800/314914267</a>
<b>Cub Cadet SCP21E, Cordless</b>	Electric	\$ 459	<a href="https://www.cubcadet.com/en_US/electric-lawn-mowers/scp21e/18AEB9C5B10.html">https://www.cubcadet.com/en_US/electric-lawn-mowers/scp21e/18AEB9C5B10.html</a>
<b>Greenworks 2531502, Cordless</b>	Electric	\$ 750	<a href="https://www.greenworkstools.com/pro-60v-brushless-25-inch-lawn-mower-2531502">https://www.greenworkstools.com/pro-60v-brushless-25-inch-lawn-mower-2531502</a>
<b>makita Model# XML08PT1, Cordless</b>	Electric	\$ 849	<a href="https://www.homedepot.com/p/Makita-21-in-18-Volt-X2-36-Volt-LXT-Lithium-Ion-Cordless-Walk-Behind-Self-Propelled-Lawn-Mower-Kit-with-4-Batteries-5-0-Ah-XML08PT1/312938313">https://www.homedepot.com/p/Makita-21-in-18-Volt-X2-36-Volt-LXT-Lithium-Ion-Cordless-Walk-Behind-Self-Propelled-Lawn-Mower-Kit-with-4-Batteries-5-0-Ah-XML08PT1/312938313</a>
<b>Greenworks Commercial 2526902, Cordless</b>	Electric	\$ 500	<a href="https://www.greenworkscommercial.com/48spm21-48v-24v-21-dual-volt-self-propelled-lawn-mower-with-battery-and-charger">https://www.greenworkscommercial.com/48spm21-48v-24v-21-dual-volt-self-propelled-lawn-mower-with-battery-and-charger</a>

Table G-3. Commercial ZTR Lawn Mowers used in the economic analysis.

<b>Make and model of equipment</b>	<b>Power Type</b>	<b>Price used in analysis</b>	<b>Citation (Web links last accessed in November 2021)</b>
<b>Cub Cadet ULTIMA ZT2-60</b>	Gas	\$ 4,699	<a href="https://www.homedepot.com/p/Cub-Cadet-Ultima-ZT2-60-in-Fabricated-Deck-24-HP-V-Twin-Kawasaki-FR-Series-Engine-Dual-Hydro-Drive-Gas-Zero-Turn-Riding-Lawn-Mower-ULTIMA-ZT2-60/307458559">https://www.homedepot.com/p/Cub-Cadet-Ultima-ZT2-60-in-Fabricated-Deck-24-HP-V-Twin-Kawasaki-FR-Series-Engine-Dual-Hydro-Drive-Gas-Zero-Turn-Riding-Lawn-Mower-ULTIMA-ZT2-60/307458559</a>
<b>Toro 75757</b>	Gas	\$ 4,399	<a href="https://www.homedepot.com/p/Toro-TimeCutter-54-in-IronForged-Deck-23-HP-Kawasaki-V-Twin-Gas-Dual-Hydrostatic-Zero-Turn-Riding-Mower-with-MyRIDE-CARB-75757/312648950">https://www.homedepot.com/p/Toro-TimeCutter-54-in-IronForged-Deck-23-HP-Kawasaki-V-Twin-Gas-Dual-Hydrostatic-Zero-Turn-Riding-Mower-with-MyRIDE-CARB-75757/312648950</a>

<b>Cub Cadet RZT-SX 42 EFI</b>	Gas	\$ 3,499	<a href="https://www.homedepot.com/p/Cub-Cadet-42-in-679-cc-Fuel-Injected-EFI-V-Twin-Engine-Dual-Hydro-Gas-Zero-Turn-Riding-Mower-with-Steering-Wheel-Control-RZT-SX-42-EFI/311632673">https://www.homedepot.com/p/Cub-Cadet-42-in-679-cc-Fuel-Injected-EFI-V-Twin-Engine-Dual-Hydro-Gas-Zero-Turn-Riding-Mower-with-Steering-Wheel-Control-RZT-SX-42-EFI/311632673</a>
<b>Dewalt DXGZ160P</b>	Gas	\$ 6,499	<a href="https://www.homedepot.com/p/DEWALT-Z160-Commercial-60-in-24-HP-Kawasaki-V-Twin-FR730v-Series-Engine-Dual-Hydrostatic-Gas-Zero-Turn-Lawn-Mower-DXGZ160P/314730694">https://www.homedepot.com/p/DEWALT-Z160-Commercial-60-in-24-HP-Kawasaki-V-Twin-FR730v-Series-Engine-Dual-Hydrostatic-Gas-Zero-Turn-Lawn-Mower-DXGZ160P/314730694</a>
<b>Dewalt DXGZ260P</b>	Gas	\$ 7,499	<a href="https://www.homedepot.com/p/DEWALT-Z260-Commercial-60-in-24-HP-Kawasaki-V-Twin-FS730v-Series-Engine-Dual-Hydrostatic-Gas-Zero-Turn-Lawn-Mower-DXGZ260P/314730667">https://www.homedepot.com/p/DEWALT-Z260-Commercial-60-in-24-HP-Kawasaki-V-Twin-FS730v-Series-Engine-Dual-Hydrostatic-Gas-Zero-Turn-Lawn-Mower-DXGZ260P/314730667</a>
<b>Beast 50ZBM21</b>	Gas	\$ 3,199	<a href="https://www.homedepot.com/p/Beast-50-in-656cc-20-HP-Gas-Powered-by-Briggs-and-Stratton-Engine-Zero-Turn-Riding-Mower-with-Powerful-Dual-Hydrostatic-50ZBM21/315960081">https://www.homedepot.com/p/Beast-50-in-656cc-20-HP-Gas-Powered-by-Briggs-and-Stratton-Engine-Zero-Turn-Riding-Mower-with-Powerful-Dual-Hydrostatic-50ZBM21/315960081</a>
<b>Dewalt DXGX554P</b>	Gas	\$ 9,499	<a href="https://www.homedepot.com/p/DEWALT-X554-Commercial-54-in-26-HP-Kawasaki-V-Twin-FT730v-EFI-Series-Engine-Stand-On-Dual-Hydro-Gas-Zero-Turn-Lawn-Mower-DXGX554P/314730723">https://www.homedepot.com/p/DEWALT-X554-Commercial-54-in-26-HP-Kawasaki-V-Twin-FT730v-EFI-Series-Engine-Stand-On-Dual-Hydro-Gas-Zero-Turn-Lawn-Mower-DXGX554P/314730723</a>
<b>Ryobi RY48ZTR75-CMB40</b>	Electric	\$ 4,397	<a href="https://www.homedepot.com/p/RYOBI-42-in-75-Ah-Battery-Electric-Riding-Zero-Turn-Mower-with-40V-String-Trimmed-and-Blower-RY48ZTR75-CMB40/317264833">https://www.homedepot.com/p/RYOBI-42-in-75-Ah-Battery-Electric-Riding-Zero-Turn-Mower-with-40V-String-Trimmed-and-Blower-RY48ZTR75-CMB40/317264833</a>
<b>Ryobi RY48140</b>	Electric	\$ 5,499	<a href="https://www.homedepot.com/p/RYOBI-48-Volt-Brushless-54-in-115-Ah-Battery-Electric-Riding-Zero-Turn-Mower-RY48140/314846874">https://www.homedepot.com/p/RYOBI-48-Volt-Brushless-54-in-115-Ah-Battery-Electric-Riding-Zero-Turn-Mower-RY48140/314846874</a>
<b>Cub Cadet ULTIMA ZT1-42E</b>	Electric	\$ 4,999	<a href="https://www.homedepot.com/p/Cub-Cadet-Ultima-ZT1-42-in-56-Volt-MAX-60-Ah-Battery-Lithium-Ion-Electric-Drive-Zero-Turn-Riding-Lawn-Mower-ULTIMA-ZT1-42E/314699248">https://www.homedepot.com/p/Cub-Cadet-Ultima-ZT1-42-in-56-Volt-MAX-60-Ah-Battery-Lithium-Ion-Electric-Drive-Zero-Turn-Riding-Lawn-Mower-ULTIMA-ZT1-42E/314699248</a>
<b>Cub Cadet ZT1 42E</b>	Electric	\$ 4,999	<a href="https://www.cubcadet.com/en_US/electric-lawn-mowers/zt1-42e/34ABA2CS710.html">https://www.cubcadet.com/en_US/electric-lawn-mowers/zt1-42e/34ABA2CS710.html</a>
<b>Greenworks Commercial 7407002</b>	Electric	\$ 5,000	<a href="https://www.greenworkscommercial.com/pro-82v-42-inch-rz-zero-turn-mower-7407002">https://www.greenworkscommercial.com/pro-82v-42-inch-rz-zero-turn-mower-7407002</a>
<b>Greenworks Commercial 7045502</b>	Electric	\$ 15,000	<a href="https://www.greenworkscommercial.com/pz-48s-48-professional-stand-on-zero-turn-mower">https://www.greenworkscommercial.com/pz-48s-48-professional-stand-on-zero-turn-mower</a>
<b>Greenworks Commercial 2522302</b>	Electric	\$ 17,000	<a href="https://www.greenworkscommercial.com/cz60r-82-volt-60-ride-on-zero-turn-mower">https://www.greenworkscommercial.com/cz60r-82-volt-60-ride-on-zero-turn-mower</a>
<b>Greenworks Commercial 2501702</b>	Electric	\$ 13,800	<a href="https://www.greenworkscommercial.com/gz52r-82-volt-52-ride-on-zero-turn-mower">https://www.greenworkscommercial.com/gz52r-82-volt-52-ride-on-zero-turn-mower</a>

**Table G-4. Residential Pressure Washers used in the economic analysis.**

<b>Make and model of equipment</b>	<b>Power Type</b>	<b>Price used in analysis</b>	<b>Citation (Web links last accessed in November 2021)</b>
<b>Ryobi RY802925VNM</b>	Gas	\$ 329	<a href="https://www.homedepot.com/p/RYOBI-2900-PSI-2-5-GPM-Cold-Water-Gas-Pressure-Washer-RY802925VNM/314110918">https://www.homedepot.com/p/RYOBI-2900-PSI-2-5-GPM-Cold-Water-Gas-Pressure-Washer-RY802925VNM/314110918</a>
<b>Ryobi RY803265VNM</b>	Gas	\$ 379	<a href="https://www.homedepot.com/p/RYOBI-3200-PSI-2-3-GPM-Cold-Water-196cc-Kohler-Gas-Pressure-Washer-and-15-in-Surface-Cleaner-RY803265VNM/315124579">https://www.homedepot.com/p/RYOBI-3200-PSI-2-3-GPM-Cold-Water-196cc-Kohler-Gas-Pressure-Washer-and-15-in-Surface-Cleaner-RY803265VNM/315124579</a>
<b>Simpson 60551</b>	Gas	\$ 399	<a href="https://www.homedepot.com/p/SIMPSON-MegaShot-MSH3125-S-3200-PSI-at-2-5-GPM-HONDA-GC190-Cold-Water-Pressure-Washer-49-State-60551/203177499">https://www.homedepot.com/p/SIMPSON-MegaShot-MSH3125-S-3200-PSI-at-2-5-GPM-HONDA-GC190-Cold-Water-Pressure-Washer-49-State-60551/203177499</a>
<b>Ryobi RY80942</b>	Gas	\$ 449	<a href="https://www.homedepot.com/p/RYOBI-3300-PSI-2-3-GPM-Cold-Water-Gas-Pressure-Washer-with-Honda-GCV190-Idle-Down-RY80942/310449458">https://www.homedepot.com/p/RYOBI-3300-PSI-2-3-GPM-Cold-Water-Gas-Pressure-Washer-with-Honda-GCV190-Idle-Down-RY80942/310449458</a>
<b>Dewalt DXPW3324I</b>	Gas	\$ 449	<a href="https://www.homedepot.com/p/DEWALT-3300-PSI-at-2-4-GPM-Honda-Cold-Water-Professional-Gas-Pressure-Washer-DXPW3324I/314520101">https://www.homedepot.com/p/DEWALT-3300-PSI-at-2-4-GPM-Honda-Cold-Water-Professional-Gas-Pressure-Washer-DXPW3324I/314520101</a>
<b>Simpson 60808</b>	Gas	\$ 399	<a href="https://www.homedepot.com/p/SIMPSON-MegaShot-MS60805-S-3000-PSI-at-2-4-GPM-HONDA-GCV160-Cold-Water-Gas-Pressure-Washer-with-15-in-Surface-Cleaner-60808/304261786">https://www.homedepot.com/p/SIMPSON-MegaShot-MS60805-S-3000-PSI-at-2-4-GPM-HONDA-GCV160-Cold-Water-Gas-Pressure-Washer-with-15-in-Surface-Cleaner-60808/304261786</a>
<b>Westinghouse WPX3200</b>	Gas	\$ 284	<a href="https://www.homedepot.com/p/Westinghouse-WPX-3200-PSI-2-5-GPM-Gas-Powered-Axial-Cam-Pump-Pressure-Washer-with-Quick-Connect-Tips-WPX3200/310323685">https://www.homedepot.com/p/Westinghouse-WPX-3200-PSI-2-5-GPM-Gas-Powered-Axial-Cam-Pump-Pressure-Washer-with-Quick-Connect-Tips-WPX3200/310323685</a>
<b>Ryobi RY803023</b>	Gas	\$ 399	<a href="https://www.homedepot.com/p/RYOBI-3100-PSI-2-3-GPM-Cold-Water-Gas-Pressure-Washer-Honda-RY803023/317061018">https://www.homedepot.com/p/RYOBI-3100-PSI-2-3-GPM-Cold-Water-Gas-Pressure-Washer-Honda-RY803023/317061018</a>
<b>Excell EPW2123100</b>	Gas	\$ 349	<a href="https://www.homedepot.com/p/Excell-3100-PSI-2-8-GPM-212cc-OHV-Gas-Pressure-Washer-EPW2123100/301194101">https://www.homedepot.com/p/Excell-3100-PSI-2-8-GPM-212cc-OHV-Gas-Pressure-Washer-EPW2123100/301194101</a>
<b>Ryobi RY803325</b>	Gas	\$ 449	<a href="https://www.homedepot.com/p/RYOBI-3300-PSI-2-5-GPM-Cold-Water-Gas-Pressure-Washer-with-Honda-GCV200-Engine-RY803325/317061011">https://www.homedepot.com/p/RYOBI-3300-PSI-2-5-GPM-Cold-Water-Gas-Pressure-Washer-with-Honda-GCV200-Engine-RY803325/317061011</a>
<b>Ryobi RY142300, Corded</b>	Electric	\$ 299	<a href="https://www.homedepot.com/p/RYOBI-2300-PSI-1-2-GPM-High-Performance-Electric-Pressure-Washer-RY142300/300405751">https://www.homedepot.com/p/RYOBI-2300-PSI-1-2-GPM-High-Performance-Electric-Pressure-Washer-RY142300/300405751</a>
<b>Ryobi RY142022VNM, Corded</b>	Electric	\$ 219	<a href="https://www.homedepot.com/p/RYOBI-2000-PSI-1-2-GPM-Cold-Water-Electric-Pressure-Washer-RY142022VNM/313760964">https://www.homedepot.com/p/RYOBI-2000-PSI-1-2-GPM-Cold-Water-Electric-Pressure-Washer-RY142022VNM/313760964</a>
<b>Ryobi RY1419MTVNM, Corded</b>	Electric	\$ 159	<a href="https://www.homedepot.com/p/RYOBI-1900-PSI-1-2-GPM-Cold-Water-Wheeled-Electric-Pressure-Washer-RY1419MTVNM/311223300">https://www.homedepot.com/p/RYOBI-1900-PSI-1-2-GPM-Cold-Water-Wheeled-Electric-Pressure-Washer-RY1419MTVNM/311223300</a>
<b>Ryobi RY141612, Corded</b>	Electric	\$ 99	<a href="https://www.homedepot.com/p/RYOBI-1-600-PSI-1-2-GPM-Electric-Pressure-Washer-RY141612/301004462">https://www.homedepot.com/p/RYOBI-1-600-PSI-1-2-GPM-Electric-Pressure-Washer-RY141612/301004462</a>

<b>Ryobi RY142300-SC, Corded</b>	Electric	\$ 313	<a href="https://www.homedepot.com/p/RYOBI-2300-PSI-1-2-GPM-High-Performance-Electric-Pressure-Washer-with-12-in-Surface-Cleaner-RY142300-SC/311654299">https://www.homedepot.com/p/RYOBI-2300-PSI-1-2-GPM-High-Performance-Electric-Pressure-Washer-with-12-in-Surface-Cleaner-RY142300-SC/311654299</a>
<b>Ryobi RY141612-SC19, Corded</b>	Electric	\$ 121	<a href="https://www.homedepot.com/p/RYOBI-1600-PSI-1-2-GPM-Electric-Pressure-Washer-with-12-in-Surface-Cleaner-RY141612-SC19/309172194">https://www.homedepot.com/p/RYOBI-1600-PSI-1-2-GPM-Electric-Pressure-Washer-with-12-in-Surface-Cleaner-RY141612-SC19/309172194</a>
<b>Ryobi RY141820VNM, Corded</b>	Electric	\$ 143	<a href="https://www.homedepot.com/p/RYOBI-1800-PSI-1-2-GPM-Cold-Water-Electric-Pressure-Washer-RY141820VNM/310828626">https://www.homedepot.com/p/RYOBI-1800-PSI-1-2-GPM-Cold-Water-Electric-Pressure-Washer-RY141820VNM/310828626</a>
<b>Sun Joe SPX4600, Corded</b>	Electric	\$ 274	<a href="https://www.homedepot.com/p/Sun-Joe-3000-PSI-Max-1-3-GPM-14-5-Amp-High-Performance-Brushless-Induction-Motor-Electric-Pressure-Washer-SPX4600/311563668">https://www.homedepot.com/p/Sun-Joe-3000-PSI-Max-1-3-GPM-14-5-Amp-High-Performance-Brushless-Induction-Motor-Electric-Pressure-Washer-SPX4600/311563668</a>
<b>Dewalt DCPW550BWB205CK, Cordless</b>	Electric	\$ 298	<a href="https://www.homedepot.com/p/DEWALT-550-PSI-1-0-GPM-Cold-Water-Cordless-Electric-Power-Cleaner-with-20-Volt-5-0Ah-Battery-Charger-and-Tool-Bag-DCPW550BWB205CK/315568968">https://www.homedepot.com/p/DEWALT-550-PSI-1-0-GPM-Cold-Water-Cordless-Electric-Power-Cleaner-with-20-Volt-5-0Ah-Battery-Charger-and-Tool-Bag-DCPW550BWB205CK/315568968</a>
<b>Ryobi RY40PW01DG9, Cordless</b>	Electric	\$ 499	<a href="https://www.homedepot.com/p/RYOBI-40-Volt-1500-PSI-1-2-GPM-Cordless-Cold-Water-Electric-Pressure-Washer-with-2-5-0-Ah-Batteries-and-Charger-RY40PW01DG9/312654809">https://www.homedepot.com/p/RYOBI-40-Volt-1500-PSI-1-2-GPM-Cordless-Cold-Water-Electric-Pressure-Washer-with-2-5-0-Ah-Batteries-and-Charger-RY40PW01DG9/312654809</a>
<b>Ryobi RY120352K, Cordless</b>	Electric	\$ 149	<a href="https://www.homedepot.com/p/RYOBI-ONE-18V-EZClean-320-PSI-0-8-GPM-Cordless-Cold-Water-Power-Cleaner-with-Battery-and-Charger-RY120352K/312910331">https://www.homedepot.com/p/RYOBI-ONE-18V-EZClean-320-PSI-0-8-GPM-Cordless-Cold-Water-Power-Cleaner-with-Battery-and-Charger-RY120352K/312910331</a>
<b>Ryobi RY121850VNM, Cordless + 1 extra battery and charger</b>	Electric	\$ 248	<a href="https://www.homedepot.com/p/RYOBI-ONE-HP-18V-Brushless-EZClean-600-PSI-0-7-GPM-Cordless-Cold-Water-Power-Cleaner-Tool-Only-RY121850VNM/317531019">https://www.homedepot.com/p/RYOBI-ONE-HP-18V-Brushless-EZClean-600-PSI-0-7-GPM-Cordless-Cold-Water-Power-Cleaner-Tool-Only-RY121850VNM/317531019</a>  <a href="https://www.homedepot.com/p/RYOBI-ONE-18V-HIGH-PERFORMANCE-Lithium-Ion-4-0-Ah-Battery-and-Charger-Starter-Kit-PSK004/315112731">https://www.homedepot.com/p/RYOBI-ONE-18V-HIGH-PERFORMANCE-Lithium-Ion-4-0-Ah-Battery-and-Charger-Starter-Kit-PSK004/315112731</a>
<b>Dewalt DCPW550B, Cordless + 2 extra battery and charger</b>	Electric	\$ 349	<a href="https://www.homedepot.com/p/DEWALT-20-Volt-550-PSI-1-0-GPM-Cold-Water-Cordless-Electric-Power-Cleaner-with-4-Nozzles-Tool-Only-DCPW550B/314265888">https://www.homedepot.com/p/DEWALT-20-Volt-550-PSI-1-0-GPM-Cold-Water-Cordless-Electric-Power-Cleaner-with-4-Nozzles-Tool-Only-DCPW550B/314265888</a>  <a href="https://www.homedepot.com/p/DEWALT-20-Volt-MAX-XR-Premium-Lithium-Ion-5-0Ah-Battery-Pack-2-Pack-Charger-Kit-Bag-DCB205-2CK/300620173">https://www.homedepot.com/p/DEWALT-20-Volt-MAX-XR-Premium-Lithium-Ion-5-0Ah-Battery-Pack-2-Pack-Charger-Kit-Bag-DCB205-2CK/300620173</a>
<b>Ryobi RY120350, Cordless + 1 extra battery and charger</b>	Electric	\$ 209	<a href="https://www.homedepot.com/p/RYOBI-ONE-18V-EZClean-320-PSI-0-8-GPM-Cordless-Cold-Water-Power-Cleaner-Tool-Only-RY120350/312453233">https://www.homedepot.com/p/RYOBI-ONE-18V-EZClean-320-PSI-0-8-GPM-Cordless-Cold-Water-Power-Cleaner-Tool-Only-RY120350/312453233</a>  <a href="https://www.homedepot.com/p/RYOBI-ONE-18V-HIGH-PERFORMANCE-Lithium-Ion-4-0-Ah-Battery-and-Charger-Starter-Kit-PSK004/315112731">https://www.homedepot.com/p/RYOBI-ONE-18V-HIGH-PERFORMANCE-Lithium-Ion-4-0-Ah-Battery-and-Charger-Starter-Kit-PSK004/315112731</a>

**Table G-5. Commercial Pressure Washers used in the economic analysis.**

<b>Make and model of equipment</b>	<b>Power Type</b>	<b>Price used in analysis</b>	<b>Citation (Web links last accessed in November 2021)</b>
<b>Commercial EZO4035GKGP12</b>	Gas	\$ 3,199	<a href="https://www.homedepot.com/p/Commercial-4000-PSI-3-5-GPM-12-Volt-Kohler-Gas-Driven-Hot-Water-Pressure-Washer-EZO4035GKGP12/303280476">https://www.homedepot.com/p/Commercial-4000-PSI-3-5-GPM-12-Volt-Kohler-Gas-Driven-Hot-Water-Pressure-Washer-EZO4035GKGP12/303280476</a>
<b>Commercial EZO4035GLEK120</b>	Gas	\$ 2,899	<a href="https://www.homedepot.com/p/Commercial-4000-PSI-3-5-GPM-Gas-Driven-Hot-Water-Pressure-Washer-110-120V-EZO4035GLEK120/302659509">https://www.homedepot.com/p/Commercial-4000-PSI-3-5-GPM-Gas-Driven-Hot-Water-Pressure-Washer-110-120V-EZO4035GLEK120/302659509</a>
<b>Simpson 95002</b>	Gas	\$ 4,999	<a href="https://www.homedepot.com/p/Simpson-95002-4200-PSI-at-4-0-GPM-with-HONDA-GX390-CAT-Triplex-Plunger-Pump-Cold-Water-Professional-Gas-Pressure-Washer-Trailer-95002/206584274">https://www.homedepot.com/p/Simpson-95002-4200-PSI-at-4-0-GPM-with-HONDA-GX390-CAT-Triplex-Plunger-Pump-Cold-Water-Professional-Gas-Pressure-Washer-Trailer-95002/206584274</a>
<b>Commercial EZO4035GKGP120</b>	Gas	\$ 3,099	<a href="https://www.homedepot.com/p/Commercial-4000-PSI-3-5-GPM-Gas-Driven-Hot-Water-Pressure-Washer-110-120V-EZO4035GKGP120/302659564">https://www.homedepot.com/p/Commercial-4000-PSI-3-5-GPM-Gas-Driven-Hot-Water-Pressure-Washer-110-120V-EZO4035GKGP120/302659564</a>
<b>Simpson 60824</b>	Gas	\$ 1,059	<a href="https://www.homedepot.com/p/SIMPSON-Water-Blaster-WB60824-4400-PSI-at-4-0-GPM-420-Belt-Drive-Cold-Water-Pressure-Washer-60824/300099185">https://www.homedepot.com/p/SIMPSON-Water-Blaster-WB60824-4400-PSI-at-4-0-GPM-420-Belt-Drive-Cold-Water-Pressure-Washer-60824/300099185</a>
<b>Simpson 95005</b>	Gas	\$ 8,329	<a href="https://www.homedepot.com/p/SIMPSON-95005-4000-PSI-at-4-0-GPM-HONDA-GX390-with-COMET-Triplex-Plunger-Pump-Hot-Water-Professional-Gas-Pressure-Washer-Trailer-95005/304518811">https://www.homedepot.com/p/SIMPSON-95005-4000-PSI-at-4-0-GPM-HONDA-GX390-with-COMET-Triplex-Plunger-Pump-Hot-Water-Professional-Gas-Pressure-Washer-Trailer-95005/304518811</a>
<b>Simpson 95003</b>	Gas	\$ 5,749	<a href="https://www.homedepot.com/p/Simpson-95003-4200-PSI-at-4-0-GPM-with-HONDA-GX390-Cold-Water-Pressure-Washer-Trailer-95003/206584275">https://www.homedepot.com/p/Simpson-95003-4200-PSI-at-4-0-GPM-with-HONDA-GX390-Cold-Water-Pressure-Washer-Trailer-95003/206584275</a>
<b>Simpson 95001</b>	Gas	\$ 4,450	<a href="https://www.homedepot.com/p/Simpson-95001-3800-PSI-at-3-5-GPM-HONDA-GX270-Cold-Water-Pressure-Washer-Trailer-95001/206584273">https://www.homedepot.com/p/Simpson-95001-3800-PSI-at-3-5-GPM-HONDA-GX270-Cold-Water-Pressure-Washer-Trailer-95001/206584273</a>
<b>Simpson 95004</b>	Gas	\$ 5,950	<a href="https://www.homedepot.com/p/SIMPSON-4200-PSI-at-4-0-GPM-VANGUARD-V-Twin-Cold-Water-Gas-Pressure-Washer-Trailer-95004/206584276">https://www.homedepot.com/p/SIMPSON-4200-PSI-at-4-0-GPM-VANGUARD-V-Twin-Cold-Water-Gas-Pressure-Washer-Trailer-95004/206584276</a>
<b>ECHO PW-4200</b>	Gas	\$ 1,332	<a href="https://www.homedepot.com/p/ECHO-4200-PSI-4-0-GPM-Gas-Pressure-Washer-PW-4200/312665049">https://www.homedepot.com/p/ECHO-4200-PSI-4-0-GPM-Gas-Pressure-Washer-PW-4200/312665049</a>

**Table G-6. Portable Generators used in the economic analysis.**

<b>Make and model of equipment</b>	<b>Power Type</b>	<b>Price used in analysis</b>	<b>Citation (Web links last accessed in November 2021)</b>
<b>Duromax XP12000EH</b>	Gas	\$ 1,399	<a href="https://www.homedepot.com/p/DUROMAX-12000-Watt-9500-Watt-Electric-Start-Dual-Fuel-Gas-Propane-Portable-Generator-Home-Back-Up-RV-Ready-50-State-Approved-XP12000EH/300659728">https://www.homedepot.com/p/DUROMAX-12000-Watt-9500-Watt-Electric-Start-Dual-Fuel-Gas-Propane-Portable-Generator-Home-Back-Up-RV-Ready-50-State-Approved-XP12000EH/300659728</a>
<b>Champion Power Equipment 100592</b>	Gas	\$ 889	<a href="https://www.homedepot.com/p/Champion-Power-Equipment-6250-Watt-Gas-and-Propane-Powered-Dual-Fuel-Portable-Generator-with-CO-Shield-Technology-100592/308173035">https://www.homedepot.com/p/Champion-Power-Equipment-6250-Watt-Gas-and-Propane-Powered-Dual-Fuel-Portable-Generator-with-CO-Shield-Technology-100592/308173035</a>
<b>Duromax XP13000EH</b>	Gas	\$ 1,499	<a href="https://www.homedepot.com/p/DUROMAX-13000-10500-Watt-Push-Start-Heavy-Duty-Dual-Fuel-Powered-Portable-Generator-Transfer-Switch-and-Home-Backup-Ready-XP13000EH/308311541">https://www.homedepot.com/p/DUROMAX-13000-10500-Watt-Push-Start-Heavy-Duty-Dual-Fuel-Powered-Portable-Generator-Transfer-Switch-and-Home-Backup-Ready-XP13000EH/308311541</a>
<b>Duromax XP10000HX</b>	Gas	\$ 1,399	<a href="https://www.homedepot.com/p/DUROMAX-10000-8000-Watt-Dual-Fuel-Electric-Push-Start-Gasoline-Propane-Portable-Generator-with-CO-Alert-Shutdown-Sensor-XP10000HX/314186064?ITC=AUC-68349-23-12070">https://www.homedepot.com/p/DUROMAX-10000-8000-Watt-Dual-Fuel-Electric-Push-Start-Gasoline-Propane-Portable-Generator-with-CO-Alert-Shutdown-Sensor-XP10000HX/314186064?ITC=AUC-68349-23-12070</a>
<b>Ryobi RY906500S</b>	Gas	\$ 849	<a href="https://www.homedepot.com/p/RYOBI-6-500-Watt-Gasoline-Powered-Portable-Generator-with-CO-Shutdown-Sensor-RY906500S/305311298">https://www.homedepot.com/p/RYOBI-6-500-Watt-Gasoline-Powered-Portable-Generator-with-CO-Shutdown-Sensor-RY906500S/305311298</a>
<b>Duromax XP13000HX</b>	Gas	\$ 1,699	<a href="https://www.homedepot.com/p/DUROMAX-13000-10500-Watt-Dual-Fuel-Electric-Push-Start-Gasoline-Propane-Portable-Generator-with-CO-Alert-Shutdown-Sensor-XP13000HX/314186063">https://www.homedepot.com/p/DUROMAX-13000-10500-Watt-Dual-Fuel-Electric-Push-Start-Gasoline-Propane-Portable-Generator-with-CO-Alert-Shutdown-Sensor-XP13000HX/314186063</a>
<b>Westinghouse iGen4500DF</b>	Gas	\$ 1,099	<a href="https://www.homedepot.com/p/Westinghouse-iGen4500DF-4500-3700-Watt-Dual-Fuel-Portable-Inverter-Generator-with-LED-Display-Electric-Remote-Start-and-RV-Ready-iGen4500DF/314515883">https://www.homedepot.com/p/Westinghouse-iGen4500DF-4500-3700-Watt-Dual-Fuel-Portable-Inverter-Generator-with-LED-Display-Electric-Remote-Start-and-RV-Ready-iGen4500DF/314515883</a>
<b>Champion Power Equipment 100297</b>	Gas	\$ 1,116	<a href="https://www.homedepot.com/p/Champion-Power-Equipment-10-000-8-000-Watt-Gas-and-Propane-Powered-Dual-Fuel-Portable-Generator-100297/301793638?ITC=AUC-106109-23-12070">https://www.homedepot.com/p/Champion-Power-Equipment-10-000-8-000-Watt-Gas-and-Propane-Powered-Dual-Fuel-Portable-Generator-100297/301793638?ITC=AUC-106109-23-12070</a>
<b>Ryobi RYi2322VNM</b>	Gas	\$ 649	<a href="https://www.homedepot.com/p/RYOBI-2-300-Watt-Recoil-Start-Bluetooth-Super-Quiet-Gasoline-Powered-Digital-Inverter-Generator-with-CO-Shutdown-Sensor-RYi2322VNM/313551452">https://www.homedepot.com/p/RYOBI-2-300-Watt-Recoil-Start-Bluetooth-Super-Quiet-Gasoline-Powered-Digital-Inverter-Generator-with-CO-Shutdown-Sensor-RYi2322VNM/313551452</a>
<b>Honda EU7000ISNAN</b>	Gas	\$ 4,599	<a href="https://www.homedepot.com/p/Honda-7000-Watt-Ultra-Quiet-Remote-Start-Stop-Electric-Recoil-Start-Gasoline-Powered-Inverter-Generator-EU7000ISNAN/316605166">https://www.homedepot.com/p/Honda-7000-Watt-Ultra-Quiet-Remote-Start-Stop-Electric-Recoil-Start-Gasoline-Powered-Inverter-Generator-EU7000ISNAN/316605166</a>
<b>Jackery HTE053-880, Cordless</b>	Electric	\$ 799	<a href="https://www.homedepot.com/p/Jackery-1000-Watt-Continuous-2000-Watt-Peak-Output-Power-Station-Explorer-880-Push-Button-Start-Battery-Generator-for-Outdoors-HTE053-880/314585794">https://www.homedepot.com/p/Jackery-1000-Watt-Continuous-2000-Watt-Peak-Output-Power-Station-Explorer-880-Push-Button-Start-Battery-Generator-for-Outdoors-HTE053-880/314585794</a>
<b>Milwaukee MXF002-2XC, Cordless</b>	Electric	\$ 2,199	<a href="https://www.homedepot.com/p/Milwaukee-MX-FUEL-3600-Watt-1800-Watt-Lithium-Ion-Battery-Powered-Push-Start-Portable-Power-Station-Generator-W-2-Batteries-MXF002-2XC/312264043">https://www.homedepot.com/p/Milwaukee-MX-FUEL-3600-Watt-1800-Watt-Lithium-Ion-Battery-Powered-Push-Start-Portable-Power-Station-Generator-W-2-Batteries-MXF002-2XC/312264043</a>



<b>Jackery HTE0721500A, Cordless</b>	Electric	\$ 1,599	<a href="https://www.homedepot.com/p/Jackery-1800-Watt-Continuous-3600W-Peak-Output-Power-Station-Explorer-1500-Push-Button-Start-Battery-Generator-for-Outdoors-HTE0721500A/316708017">https://www.homedepot.com/p/Jackery-1800-Watt-Continuous-3600W-Peak-Output-Power-Station-Explorer-1500-Push-Button-Start-Battery-Generator-for-Outdoors-HTE0721500A/316708017</a>
<b>Duracell DR660PSS, Cordless</b>	Electric	\$ 700	<a href="https://www.homedepot.com/p/Duracell-PowerSource-1800-Watt-Peak-Push-Button-Start-Quiet-Gasless-Portable-Power-Generator-DR660PSS/313518350">https://www.homedepot.com/p/Duracell-PowerSource-1800-Watt-Peak-Push-Button-Start-Quiet-Gasless-Portable-Power-Generator-DR660PSS/313518350</a>
<b>Nature's Generator HKNGAUUEL, Cordless</b>	Electric	\$ 1,500	<a href="https://www.homedepot.com/p/NATURE-S-GENERATOR-3600-Watt-5760W-Peak-Push-Button-Start-Solar-Powered-Portable-Generator-with-Two-100W-Solar-Panels-HKNGAUUEL/313930675">https://www.homedepot.com/p/NATURE-S-GENERATOR-3600-Watt-5760W-Peak-Push-Button-Start-Solar-Powered-Portable-Generator-with-Two-100W-Solar-Panels-HKNGAUUEL/313930675</a>
<b>EcoFlow DELTA, Cordless</b>	Electric	\$ 1,099	<a href="https://www.homedepot.com/p/ECOFLOW-3300-Watt-Peak-Output-DELTA-Push-Button-Start-Portable-Battery-Power-Station-6xAC-Outlets-Solar-Generator-for-Outdoors-DELTA/316725019">https://www.homedepot.com/p/ECOFLOW-3300-Watt-Peak-Output-DELTA-Push-Button-Start-Portable-Battery-Power-Station-6xAC-Outlets-Solar-Generator-for-Outdoors-DELTA/316725019</a>
<b>EcoFlow DELTA2000-US, Cordless</b>	Electric	\$ 1,899	<a href="https://www.homedepot.com/p/EcoFlow-5000-Watt-Peak-Output-DELTA-Max-Push-Button-Start-Portable-Battery-Power-Station-Solar-Generator-for-Outdoors-DELTA2000-US/318631123">https://www.homedepot.com/p/EcoFlow-5000-Watt-Peak-Output-DELTA-Max-Push-Button-Start-Portable-Battery-Power-Station-Solar-Generator-for-Outdoors-DELTA2000-US/318631123</a>
<b>Yeti 36500, Cordless</b>	Electric	\$ 5,400	<a href="https://www.homedepot.com/p/Goal-Zero-Yeti-6000X-Portable-Power-Station-6071Wh-Lithium-Battery-Generator-2000-Watt-AC-Inverter-Home-Backup-Solar-Generator-36500/317027799">https://www.homedepot.com/p/Goal-Zero-Yeti-6000X-Portable-Power-Station-6071Wh-Lithium-Battery-Generator-2000-Watt-AC-Inverter-Home-Backup-Solar-Generator-36500/317027799</a>
<b>Westinghouse iGen1000s, Cordless</b>	Electric	\$ 999	<a href="https://www.homedepot.com/p/Westinghouse-1500-Watt-3000-Watt-Pure-Sine-Wave-Lithium-Ion-Portable-Power-Station-LED-Display-Solar-Panel-Ready-iGen1000s/316405196">https://www.homedepot.com/p/Westinghouse-1500-Watt-3000-Watt-Pure-Sine-Wave-Lithium-Ion-Portable-Power-Station-LED-Display-Solar-Panel-Ready-iGen1000s/316405196</a>
<b>Ryobi RYI2322EVNM, Cordless</b>	Electric	\$ 799	<a href="https://www.homedepot.com/p/RYOBI-ONE-18V-Bluetooth-2-300-Watt-Starting-Electric-Start-Gasoline-Powered-Digital-Inverter-Generator-RYI2322EVNM/309391701">https://www.homedepot.com/p/RYOBI-ONE-18V-Bluetooth-2-300-Watt-Starting-Electric-Start-Gasoline-Powered-Digital-Inverter-Generator-RYI2322EVNM/309391701</a>

**Table G-7. Lawn Tractors used in the economic analysis.**

<b>Make and model of equipment</b>	<b>Power Type</b>	<b>Price used in analysis</b>	<b>Citation (Web links last accessed in November 2021)</b>
<b>Cub Cadet LT46</b>	Gas	\$ 2,199	<a href="https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-46-in-23-HP-V-Twin-Kohler-7000-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT46/317834379">https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-46-in-23-HP-V-Twin-Kohler-7000-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT46/317834379</a>
<b>Cub Cadet LT42</b>	Gas	\$ 1,999	<a href="https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-42-in-19-5-HP-Kohler-5400-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT42/317834404">https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-42-in-19-5-HP-Kohler-5400-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT42/317834404</a>
<b>John Deere BG21272</b>	Gas	\$ 2,099	<a href="https://www.homedepot.com/p/John-Deere-S120-42-in-22-HP-V-Twin-Gas-Hydrostatic-Lawn-Tractor-BG21272/314278217">https://www.homedepot.com/p/John-Deere-S120-42-in-22-HP-V-Twin-Gas-Hydrostatic-Lawn-Tractor-BG21272/314278217</a>
<b>John Deere BG21271</b>	Gas	\$ 1,799	<a href="https://www.homedepot.com/p/John-Deere-S100-42-in-17-5-HP-Gas-Hydrostatic-Lawn-Tractor-BG21271/314272233">https://www.homedepot.com/p/John-Deere-S100-42-in-17-5-HP-Gas-Hydrostatic-Lawn-Tractor-BG21271/314272233</a>
<b>Cub Cadet LT50 FAB</b>	Gas	\$ 2,399	<a href="https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-50-in-Fabricated-Deck-24-HP-V-Twin-Kohler-7000-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT50-FAB/317834354">https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-50-in-Fabricated-Deck-24-HP-V-Twin-Kohler-7000-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT50-FAB/317834354</a>
<b>Cub Cadet ST54 FAB</b>	Gas	\$ 2,999	<a href="https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-ST-54-in-Fabricated-Deck-24-HP-V-Twin-Kohler-7000-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-ST54-FAB/317834333">https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-ST-54-in-Fabricated-Deck-24-HP-V-Twin-Kohler-7000-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-ST54-FAB/317834333</a>
<b>Cub Cadet LT42</b>	Gas	\$ 2,099	<a href="https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-42-in-18-HP-Kohler-5400-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT42/318813809">https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-42-in-18-HP-Kohler-5400-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT42/318813809</a>
<b>Cub Cadet LT50 FAB CA</b>	Gas	\$ 2,599	<a href="https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-50-in-Fab-Deck-24-HP-V-Twin-Kohler-7000-Series-Engine-Hydro-Drive-Gas-Riding-Lawn-Tractor-CA-Compliant-LT50-FAB-CA/317834347">https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-50-in-Fab-Deck-24-HP-V-Twin-Kohler-7000-Series-Engine-Hydro-Drive-Gas-Riding-Lawn-Tractor-CA-Compliant-LT50-FAB-CA/317834347</a>
<b>John Deere BG21211</b>	Gas	\$ 2,599	<a href="https://www.homedepot.com/p/John-Deere-S160-48-in-24-HP-V-Twin-ELS-Gas-Hydrostatic-Lawn-Tractor-BG21211/314278311">https://www.homedepot.com/p/John-Deere-S160-48-in-24-HP-V-Twin-ELS-Gas-Hydrostatic-Lawn-Tractor-BG21211/314278311</a>
<b>Cub Cadet LT50 FAB</b>	Gas	\$ 2,399	<a href="https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-50-in-Fabricated-Deck-24-HP-V-Twin-Kohler-7000-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT50-FAB/314732025">https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-50-in-Fabricated-Deck-24-HP-V-Twin-Kohler-7000-Series-Engine-Hydrostatic-Drive-Gas-Riding-Lawn-Tractor-LT50-FAB/314732025</a>
<b>Cub Cadet LT42E, Cordless</b>	Electric	\$ 4,199	<a href="https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-42-in-56-Volt-MAX-60-Ah-Battery-Lithium-Ion-Electric-Drive-Cordless-Riding-Lawn-Tractor-LT42E/314699266">https://www.homedepot.com/p/Cub-Cadet-XT1-Enduro-LT-42-in-56-Volt-MAX-60-Ah-Battery-Lithium-Ion-Electric-Drive-Cordless-Riding-Lawn-Tractor-LT42E/314699266</a>
<b>Cub Cadet CC30E, Cordless</b>	Electric	\$ 2,999	<a href="https://www.cubcadet.com/en_US/electric-lawn-mowers/cc30e/33AA27JDB10.html">https://www.cubcadet.com/en_US/electric-lawn-mowers/cc30e/33AA27JDB10.html</a>
<b>Ryobi RY48111, Cordless</b>	Electric	\$ 3,199	<a href="https://www.homedepot.com/p/RYOBI-48V-Brushless-38-in-100-Ah-Battery-Electric-Rear-Engine-Riding-Lawn-Mower-RY48111/300422546">https://www.homedepot.com/p/RYOBI-48V-Brushless-38-in-100-Ah-Battery-Electric-Rear-Engine-Riding-Lawn-Mower-RY48111/300422546</a>



<b>Ryobi RY48110, Cordless</b>	Electric	\$ 2,999	<a href="https://www.homedepot.com/p/RYOBI-48V-Brushless-38-in-75-Ah-Battery-Electric-Rear-Engine-Riding-Lawn-Mower-RY48110/300246266">https://www.homedepot.com/p/RYOBI-48V-Brushless-38-in-75-Ah-Battery-Electric-Rear-Engine-Riding-Lawn-Mower-RY48110/300246266</a>
<b>Ryobi RY48130, Cordless</b>	Electric	\$ 2,599	<a href="https://www.homedepot.com/p/RYOBI-48V-Brushless-30-in-50-Ah-Battery-Electric-Rear-Engine-Riding-Mower-RY48130/312460582">https://www.homedepot.com/p/RYOBI-48V-Brushless-30-in-50-Ah-Battery-Electric-Rear-Engine-Riding-Mower-RY48130/312460582</a>
<b>Weibang WB76E, Cordless</b>	Electric	\$ 3,450	<a href="https://www.homedepot.com/p/Weibang-E-Rider-30in-72V-Lithium-Ion-Battery-Electric-Rear-Engine-Riding-Mower-WB76E/307713734">https://www.homedepot.com/p/Weibang-E-Rider-30in-72V-Lithium-Ion-Battery-Electric-Rear-Engine-Riding-Mower-WB76E/307713734</a>
<b>Cub Cadet XT1 LT42E, Cordless</b>	Electric	\$ 4,199	<a href="https://www.cubcadet.com/en_US/electric-lawn-mowers/xt1-lt42e/33ABA7ES710.html">https://www.cubcadet.com/en_US/electric-lawn-mowers/xt1-lt42e/33ABA7ES710.html</a>
<b>Ryobi RY48130-1A, Cordless</b>	Electric	\$ 2,698	<a href="https://www.homedepot.com/p/RYOBI-48-Volt-Brushless-30-in-50-Ah-Battery-Electric-Rear-Engine-Riding-Mower-and-Bagging-Kit-RY48130-1A/313872481">https://www.homedepot.com/p/RYOBI-48-Volt-Brushless-30-in-50-Ah-Battery-Electric-Rear-Engine-Riding-Mower-and-Bagging-Kit-RY48130-1A/313872481</a>

**Table G-9. Pumps (<2 hp) used in the economic analysis.**

<b>Make and model of equipment</b>	<b>Power Type</b>	<b>Price used in analysis</b>	<b>Citation (Web links last accessed in November 2021)</b>
<b>Sportsman 803518</b>	Gas	\$ 193	<a href="https://www.homedepot.com/p/Sportsman-1-4-HP-1-in-2-Cycle-Gas-Powered-Water-Transfer-Utility-Pump-with-3-4-in-Garden-Hose-Adapter-803518/305928218">https://www.homedepot.com/p/Sportsman-1-4-HP-1-in-2-Cycle-Gas-Powered-Water-Transfer-Utility-Pump-with-3-4-in-Garden-Hose-Adapter-803518/305928218</a>
<b>XtremepowerUS 72029</b>	Gas	\$ 210	<a href="https://www.homedepot.com/p/XtremepowerUS-1-1-5-HP-Gas-Powered-Portable-Water-Utility-Transfer-Pump-72029/317056726">https://www.homedepot.com/p/XtremepowerUS-1-1-5-HP-Gas-Powered-Portable-Water-Utility-Transfer-Pump-72029/317056726</a>
<b>Champion Power Equipment 100742</b>	Gas	\$ 348	<a href="https://www.homedepot.com/p/Champion-Power-Equipment-2-in-Gas-Powered-Semi-Trash-Water-Transfer-Pump-with-Hose-and-Wheel-Kit-100742/314592691">https://www.homedepot.com/p/Champion-Power-Equipment-2-in-Gas-Powered-Semi-Trash-Water-Transfer-Pump-with-Hose-and-Wheel-Kit-100742/314592691</a>
<b>Honda WX10TA</b>	Gas	\$ 445	<a href="https://www.homedepot.com/p/Honda-0-76-HP-1-in-General-Purpose-Utility-Water-Pump-WX10TA/312583399">https://www.homedepot.com/p/Honda-0-76-HP-1-in-General-Purpose-Utility-Water-Pump-WX10TA/312583399</a>
<b>Koshin SEH-25L</b>	Gas	\$ 402	<a href="https://www.homedepot.com/p/Koshin-1-in-1-HP-Centrifugal-Pump-with-Honda-Engine-SEH-25L/203716397">https://www.homedepot.com/p/Koshin-1-in-1-HP-Centrifugal-Pump-with-Honda-Engine-SEH-25L/203716397</a>
<b>Wacker 5100013999</b>	Gas	\$ 428	<a href="https://www.homedepot.com/p/Wacker-1-1-HP-Centrifugal-Dewatering-Pump-with-1-in-Hose-Kit-5100013999/206721191">https://www.homedepot.com/p/Wacker-1-1-HP-Centrifugal-Dewatering-Pump-with-1-in-Hose-Kit-5100013999/206721191</a>
<b>Generac</b>	Gas	\$ 249	<a href="https://www.homedepot.com/p/Generac-2HP-1-in-Gas-Powered-Clean-Water-Pump-with-Hose-Kit-6917/207041131">https://www.homedepot.com/p/Generac-2HP-1-in-Gas-Powered-Clean-Water-Pump-with-Hose-Kit-6917/207041131</a>

<b>Milwaukee 2771-20, Cordless + 1 extra battery and charger</b>	Electric	\$ 378	<a href="https://www.homedepot.com/p/Milwaukee-M18-18-Volt-1-4-HP-Lithium-Ion-Cordless-Transfer-Pump-Tool-Only-2771-20/300510172">https://www.homedepot.com/p/Milwaukee-M18-18-Volt-1-4-HP-Lithium-Ion-Cordless-Transfer-Pump-Tool-Only-2771-20/300510172</a>  <a href="https://www.homedepot.com/p/Milwaukee-M18-18-Volt-Lithium-Ion-XC-Starter-Kit-with-One-5-0Ah-Battery-and-Charger-48-59-1850/205794132">https://www.homedepot.com/p/Milwaukee-M18-18-Volt-Lithium-Ion-XC-Starter-Kit-with-One-5-0Ah-Battery-and-Charger-48-59-1850/205794132</a>
<b>Everbilt EBTP1, Corded</b>	Electric	\$ 98	<a href="https://www.homedepot.com/p/Everbilt-1-10-HP-Non-Submersible-Self-Priming-Transfer-Pump-EBTP1/308300938">https://www.homedepot.com/p/Everbilt-1-10-HP-Non-Submersible-Self-Priming-Transfer-Pump-EBTP1/308300938</a>
<b>Ryobi P750, Cordless + 1 extra battery and charger</b>	Electric	\$ 187	<a href="https://www.homedepot.com/p/RYOBI-ONE-18V-Hybrid-Transfer-Pump-P750/300258095">https://www.homedepot.com/p/RYOBI-ONE-18V-Hybrid-Transfer-Pump-P750/300258095</a>  <a href="https://www.homedepot.com/p/RYOBI-ONE-18V-Lithium-Ion-2-0-Ah-Battery-and-Dual-Chemistry-IntelliPort-Charger-Kit-P163/301913880">https://www.homedepot.com/p/RYOBI-ONE-18V-Lithium-Ion-2-0-Ah-Battery-and-Dual-Chemistry-IntelliPort-Charger-Kit-P163/301913880</a>
<b>Milwaukee 2771-20-48-59-1850, Cordless</b>	Electric	\$ 378	<a href="https://www.homedepot.com/p/Milwaukee-M18-18-Volt-1-4-HP-Lithium-Ion-Cordless-Transfer-Pump-with-M18-Starter-Kit-with-One-5-0-Ah-Battery-and-Charger-2771-20-48-59-1850/312182593">https://www.homedepot.com/p/Milwaukee-M18-18-Volt-1-4-HP-Lithium-Ion-Cordless-Transfer-Pump-with-M18-Starter-Kit-with-One-5-0-Ah-Battery-and-Charger-2771-20-48-59-1850/312182593</a>
<b>Milwaukee 2771-21, Cordless</b>	Electric	\$ 349	<a href="https://www.homedepot.com/p/Milwaukee-M18-18-Volt-1-4-HP-Lithium-Ion-Cordless-Transfer-Pump-Kit-with-1-3-0Ah-Battery-and-Charger-2771-21/300510182">https://www.homedepot.com/p/Milwaukee-M18-18-Volt-1-4-HP-Lithium-Ion-Cordless-Transfer-Pump-Kit-with-1-3-0Ah-Battery-and-Charger-2771-21/300510182</a>
<b>Milwaukee 2771-20-48-11-1820, Cordless</b>	Electric	\$ 278	<a href="https://www.homedepot.com/p/Milwaukee-M18-18-Volt-1-4-HP-Lithium-Ion-Cordless-Transfer-Pump-with-M18-2-0Ah-Battery-2771-20-48-11-1820/313792654">https://www.homedepot.com/p/Milwaukee-M18-18-Volt-1-4-HP-Lithium-Ion-Cordless-Transfer-Pump-with-M18-2-0Ah-Battery-2771-20-48-11-1820/313792654</a>

**Table G-10. Pumps (>2 hp and ≤25 hp) used in the economic analysis.**

<b>Make and model of equipment</b>	<b>Power Type</b>	<b>Price used in analysis</b>	<b>Citation (Web links last accessed in November 2021)</b>
<b>Stanley ST1WP-CA</b>	Gas	\$ 193	<a href="https://www.homedepot.com/p/Stanley-3-HP-Non-Submersible-1-in-Displacement-Water-Pump-ST1WP-CA/206874724">https://www.homedepot.com/p/Stanley-3-HP-Non-Submersible-1-in-Displacement-Water-Pump-ST1WP-CA/206874724</a>
<b>Wacker 620773</b>	Gas	\$ 1,948	<a href="https://www.homedepot.com/p/Wacker-3-5-HP-3-in-Diaphragm-Pump-with-Honda-Engine-0620773/204358350">https://www.homedepot.com/p/Wacker-3-5-HP-3-in-Diaphragm-Pump-with-Honda-Engine-0620773/204358350</a>
<b>Stanley ST3WPLT</b>	Gas	\$ 339	<a href="https://www.homedepot.com/p/Stanley-7-HP-Non-Submersible-3-in-Displacement-Water-Pump-ST3WPLT/206874333">https://www.homedepot.com/p/Stanley-7-HP-Non-Submersible-3-in-Displacement-Water-Pump-ST3WPLT/206874333</a>
<b>Wacker 620769</b>	Gas	\$ 2,010	<a href="https://www.homedepot.com/p/Wacker-3-5-HP-2-in-Diaphragm-Pump-with-Honda-Engine-0620769/204358351">https://www.homedepot.com/p/Wacker-3-5-HP-2-in-Diaphragm-Pump-with-Honda-Engine-0620769/204358351</a>
<b>Everbilt 100742</b>	Gas	\$ 389	<a href="https://www.homedepot.com/p/Everbilt-5-5-HP-Gas-Powered-Utility-Pump-WG20/205959677">https://www.homedepot.com/p/Everbilt-5-5-HP-Gas-Powered-Utility-Pump-WG20/205959677</a>
<b>Generac 6821</b>	Gas	\$ 339	<a href="https://www.homedepot.com/p/Generac-3-HP-1-5-in-Gas-Powered-Clean-Water-Pump-with-Hose-Kit-6821/206275156">https://www.homedepot.com/p/Generac-3-HP-1-5-in-Gas-Powered-Clean-Water-Pump-with-Hose-Kit-6821/206275156</a>

<b>Honda WB30</b>	Gas	\$ 589	<a href="https://www.homedepot.com/p/Honda-6-HP-General-Purpose-3-in-Gasoline-Powered-Water-Pump-WB30/314334791">https://www.homedepot.com/p/Honda-6-HP-General-Purpose-3-in-Gasoline-Powered-Water-Pump-WB30/314334791</a>
<b>Honda WB20XT</b>	Gas	\$ 449	<a href="https://www.homedepot.com/p/Honda-3-5-HP-2-in-General-Purpose-Utility-Gas-Powered-Water-Pump-WB20XT/312583326">https://www.homedepot.com/p/Honda-3-5-HP-2-in-General-Purpose-Utility-Gas-Powered-Water-Pump-WB20XT/312583326</a>
<b>Duromax XP702HP</b>	Gas	\$ 422	<a href="https://www.homedepot.com/p/DUROMAX-212-CC-7-HP-2-in-70-GPM-Gas-Powered-High-Pressure-Water-Pump-XP702HP/305022652">https://www.homedepot.com/p/DUROMAX-212-CC-7-HP-2-in-70-GPM-Gas-Powered-High-Pressure-Water-Pump-XP702HP/305022652</a>
<b>Saniflo 28, Corded</b>	Electric	\$ 1,567	<a href="https://www.homedepot.com/p/Saniflo-2-x-2-HP-Commercial-Gray-Water-Pump-028/318782411">https://www.homedepot.com/p/Saniflo-2-x-2-HP-Commercial-Gray-Water-Pump-028/318782411</a>
<b>Delavan 7870-101E-SB, Corded</b>	Electric	\$ 235	<a href="https://www.homedepot.com/p/DELAVAN-PowerFlo-7-HP-12-Volt-60-PSI-On-Demand-Diaphragm-Utility-Pump-7870-101E-SB/316349567">https://www.homedepot.com/p/DELAVAN-PowerFlo-7-HP-12-Volt-60-PSI-On-Demand-Diaphragm-Utility-Pump-7870-101E-SB/316349567</a>
<b>Milwaukee 2774-21HD</b>	Electric	\$ 5,300	<a href="https://www.homedepot.com/p/Milwaukee-M18-FORCE-LOGIC-18-Volt-Lithium-Ion-Cordless-10-000-PSI-Hydraulic-Pump-Kit-with-12-0-Ah-Battery-2774-21HD/309385773">https://www.homedepot.com/p/Milwaukee-M18-FORCE-LOGIC-18-Volt-Lithium-Ion-Cordless-10-000-PSI-Hydraulic-Pump-Kit-with-12-0-Ah-Battery-2774-21HD/309385773</a>