

Plugging the Plug Load Data Hole

Plug Loads Spreadsheet

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Plug load research reports often use different labels for the same energy-use modes. We define three device modes: *Active*, in which the device is being used as intended (for example, a user is channel-surfing on the TV); *Idle*, in which the device is turned on but is in a lower-power mode (for example, a PC going into sleep mode); and *Off*, in which the device is turned off but is still drawing some power (for example, a DVD player that needs to be able to respond to a signal from a remote control). Questions:

Plug load devices, by type	Power draw (W) by mode			Hours per day in mode			Annual energy consumption (kWh)
	Active	Idle	Off	Active	Idle	Off	
Audio equipment							
CD player	6.7	—	1.3	0.30	—	23.70	12.0
Clock radio	10.0	—	3.0	1.46	—	22.54	30.0
MP3 player	1.0	—	—	16.40	—	—	6.0
Portable stereo (boom box)	7.0	—	—	0.98	—	23.02	2.5
Small stereo with remote	24.0	—	6.0	0.37	—	23.63	55.0
Stereo	60.0	—	—	1.00	—	23.00	22.0
Home automation and security							
Garage door opener	108.0	—	4.8	0.43	—	23.57	58.0
Security system	13.7	—	—	24.00	—	—	120.0
Smoke detector (hardwired)	1.0	—	—	24.00	—	—	8.8
Home office equipment							
Color copier (1–49 images per minute)	—	—	—	—	—	—	552.7
Color copier (1–49 images per minute), Energy Star	—	—	—	—	—	—	513.6
Color copier (50+ images per minute)	—	—	—	—	—	—	1371.4
Color copier (50+ images per minute), Energy Star	—	—	—	—	—	—	1199.3
Copier (1–25 images per minute)	—	—	—	—	—	—	146.0
Copier (1–25 images per minute), Energy Star	—	—	—	—	—	—	73.0
Copier (26–50 images per minute)	—	—	—	—	—	—	302.4
Copier (26–50 images per minute), Energy Star	—	—	—	—	—	—	151.2
Copier (51+ images per minute)	—	—	—	—	—	—	756.5
Copier (51+ images per minute), Energy Star	—	—	—	—	—	—	594.4
Decorative fountain (desktop)	2.0	—	—	8.22	—	15.78	6.0
Desktop computer	68.8	3.4	1.7	9.10	1.10	13.80	238.5
Desktop computer, Energy Star	46.2	2.5	1.5	9.10	1.10	13.80	161.8
Digital photo frame, 7-inch	0.6	—	—	24.00	—	—	5.5
External computer speakers	7.0	—	2.0	1.36	-	22.64	20.0
Fax (inkjet)	—	—	—	—	—	—	28.0

Fax (inkjet), Energy Star	—	—	—	—	—	—	14.0
Fax (laser)	—	—	—	—	—	—	156.0
Fax (laser), Energy Star	—	—	—	—	—	—	78.0
Laptop computer	20.9	1.6	1.0	9.10	1.10	13.80	75.2
Laptop computer, Energy Star	14.1	1.4	0.8	9.10	1.10	13.80	51.5
Modem (cable)	6.0	—	—	24.00	—	—	52.6
Modem (DSL)	5.6	—	—	24.00	—	—	49.3
Monitor	32.2	0.7	0.7	5.20	1.20	17.60	66.2
Monitor, Energy Star	25.2	0.7	0.6	5.20	1.20	17.60	52.0
Multifunction device (inkjet)	—	—	—	—	—	—	27.0
Multifunction device (inkjet), Energy Star	—	—	—	—	—	—	11.0
Multifunction device (laser, color)	—	—	—	—	—	—	900.0
Multifunction device (laser, color), Energy Star	—	—	—	—	—	—	641.0
Multifunction device (laser, monochrome)	—	—	—	—	—	—	651.0
Multifunction device (laser, monochrome), Energy Star	—	—	—	—	—	—	426.0
Printer (inkjet)	—	—	—	—	—	—	21.0
Printer (inkjet), Energy Star	—	—	—	—	—	—	16.0
Printer (laser)	—	—	—	—	—	—	747.0
Printer (laser), Energy Star	—	—	—	—	—	—	560.0
Scanner	—	—	—	—	—	—	44.0
Wireless router	6.2	1.7	—	19.10	4.90	—	48.4
Kitchen equipment							
Blender	300.0	—	—	0.05	—	23.95	5.0
Can opener	100.0	—	—	0.04	—	23.96	1.5
Coffee machine	1100.0	—	—	0.30	—	23.70	120.5
Cooktop	—	—	—	—	—	—	128.2
Dishwasher (excluding hot water)	362.0	—	—	1.14	—	22.86	151.0
Dishwasher (excluding hot water), Energy Star	278.1	—	—	1.14	—	22.86	116.0
Dishwasher (including hot water from an electric water heater)	822.3	—	—	1.14	—	22.86	343.0
Dishwasher (including hot water from an electric water heater), Energy Star	632.9	—	—	1.14	—	22.86	264.0
Espresso maker	360.0	—	—	0.17	—	23.83	22.0
Microwave oven	1500.0	—	—	0.25	—	23.75	135.0
Popcorn maker	1400.0	—	—	0.08	—	23.92	42.0
Range (cooktop/oven combination unit)	—	—	—	—	—	—	281.5
Self-cleaning oven	—	—	—	—	—	—	171.0
Stand mixer	100.0	—	—	0.08	—	23.92	3.0
Standard oven (non-self-cleaning)	—	—	—	—	—	—	166.5
Toaster	1100.0	—	—	0.10	—	23.90	40.0
Toaster oven	1200.0	—	—	0.25	—	23.75	108.0
Laundry equipment							
Clothes iron	1100.0	—	—	0.49	—	23.51	198.0
Clothes dryer, compact (120-volt)	—	—	—	—	—	—	305.0
Clothes dryer, compact (240-volt)	—	—	—	—	—	—	340.0
Clothes dryer, standard	—	—	—	—	—	—	684.0

Clothes washer (excluding water heating energy use)	—	—	—	—	—	—	75.0
Clothes washer (excluding water heating energy use), Energy Star	—	—	—	—	—	—	25.0
Clothes washer (including water heating energy use)	—	—	—	—	—	—	374.0
Clothes washer (including water heating energy use), Energy Star	—	—	—	—	—	—	126.0
Clothes washer and dryer	—	—	—	—	—	—	901.0
Clothes washer and dryer, Energy Star	—	—	—	—	—	—	467.0
Miscellaneous plug loads							
Aquarium	630.0	—	—	24.00	—	—	5518.8
Battery charger (AA batteries)	2.9	—	1.0	1.06	—	22.94	9.5
Digital camera	1.8	—	0.3	0.76	—	23.24	3.0
Electric blanket	100.0	—	—	0.44	—	23.56	16.0
Handheld vacuum cleaner	3.0	—	—	24.00	—	—	29.0
iPad 2	13.2	—	—	2.50	—	—	12.0
Night light	2.4	—	0.6	8.00	—	16.00	10.5
Power tool (cordless)	33.7	—	4.2	0.85	—	17.00	36.5
Vacuum cleaner	650.0	—	—	0.14	—	23.86	33.0
Water heater, 50-gallon heat pump	—	—	—	—	—	—	2195.0
Water heater, 50-gallon high-efficiency	—	—	—	—	—	—	4622.0
Water heater, 50-gallon standard-efficiency	—	—	—	—	—	—	4857.0
Personal grooming tools							
Curling iron	90.0	—	—	0.15	—	23.85	5.0
Hair dryer	1538.0	—	—	0.16	—	23.84	92.0
Shaver	1.4	—	1.2	4.00	—	20.00	10.8
Toothbrush	3.8	—	1.6	0.20	—	23.80	14.2
Refrigeration and freezers							
Chest freezer	46.5	—	—	24.00	—	—	406.9
Chest freezer, Energy Star	40.9	—	—	24.00	—	—	358.1
Compact bottom-mounted freezer (automatic defrost)	47.8	—	—	24.00	—	—	418.8
Compact bottom-mounted freezer (automatic defrost), Energy Star	36.8	—	—	24.00	—	—	322.5
Compact chest freezer	49.1	—	—	24.00	—	—	430.4
Compact chest freezer, Energy Star	37.8	—	—	24.00	—	—	331.4
Compact refrigerator or compact refrigerator-freezer (manual defrost)	39.0	—	—	24.00	—	—	341.3
Compact refrigerator or compact refrigerator-freezer (manual defrost), Energy Star	30.0	—	—	24.00	—	—	262.8
Compact refrigerator-freezer (partial automatic defrost)	48.6	—	—	24.00	—	—	425.7
Compact refrigerator-freezer (partial automatic defrost), Energy Star	37.4	—	—	24.00	—	—	327.8
Compact top-mounted freezer or refrigerator only (automatic defrost)	46.3	—	—	24.00	—	—	405.2
Compact top-mounted freezer or refrigerator only (automatic defrost), Energy Star	35.6	—	—	24.00	—	—	312.0
Compact upright freezer (auto defrost)	79.3	—	—	24.00	—	—	694.7
Compact upright freezer (auto defrost), Energy Star	61.1	—	—	24.00	—	—	534.9
Compact upright freezer (manual defrost)	58.4	—	—	24.00	—	—	511.4
Compact upright freezer (manual defrost), Energy Star	44.9	—	—	24.00	—	—	393.7
Refrigerator, bottom-mounted freezer (automatic defrost)	66.7	—	—	24.00	—	—	584.1
Refrigerator, bottom-mounted freezer (automatic defrost), Energy Star	52.0	—	—	24.00	—	—	455.6
Refrigerator, bottom-mounted freezer and through-door ice (automatic defrost)	77.1	—	—	24.00	—	—	675.0

Refrigerator, bottom-mounted freezer and through-door ice (automatic defrost), EStar	60.1	—	—	24.00	—	—	526.5
Refrigerator with or without a top-mounted freezer (automatic defrost)	61.9	—	—	24.00	—	—	542.5
Refrigerator with or without a top-mounted freezer (automatic defrost), Energy Star	48.3	—	—	24.00	—	—	423.2
Refrigerator-freezer or refrigerator only (manual or partially automatic defrost)	55.7	—	—	24.00	—	—	488.3
Refrigerator-freezer or refrigerator only (manual or partially automatic defrost), EStar	43.5	—	—	24.00	—	—	380.8
Side-by-side refrigerator/freezer (automatic defrost)	73.2	—	—	24.00	—	—	641.0
Side-by-side refrigerator/freezer (automatic defrost), Energy Star	57.1	—	—	24.00	—	—	500.0
Side-by-side refrigerator/freezer with through-door ice (automatic defrost)	77.7	—	—	24.00	—	—	680.7
Side-by-side refrigerator/freezer with through-door ice (automatic defrost), Energy Star	60.6	—	—	24.00	—	—	530.9
Upright freezer (automatic defrost)	75.0	—	—	24.00	—	—	657.3
Upright freezer (automatic defrost), Energy Star	66.0	—	—	24.00	—	—	578.4
Upright freezer (manual defrost)	52.4	—	—	24.00	—	—	459.4
Upright freezer (manual defrost), Energy Star	46.2	—	—	24.00	—	—	404.3
Space conditioning							
Air purifier	100.0	—	1.0	16.00	—	8.00	587.0
Air purifier, Energy Star	30.0	—	0.6	16.00	—	8.00	196.0
Dehumidifier, room	350.0	—	—	1.97	—	22.03	252.0
Dehumidifier, whole-house	141.2	—	—	24.00	—	—	1237.0
Dehumidifier, whole-house, Energy Star	110.6	—	—	24.00	—	—	969.0
Humidifier	75.0	—	—	1.97	—	22.03	54.0
Portable fan	100.0	—	—	1.97	—	22.03	72.0
Room air conditioner	1000.0	—	—	2.02	—	21.98	739.0
Space heater	1000.0	—	3.0	0.70	—	23.30	281.0
Telephony							
Answering machine	1.0	—	—	24.00	—	—	9.0
Cordless phone	3.0	—	—	24.00	—	—	26.0
iPhone 3G	—	—	—	—	—	—	2.2
iPhone 4	—	—	—	—	—	—	3.3
Mobile phone	4.0	—	—	6.85	—	17.15	10.0
Television peripherals							
Apple TV streaming box	3.0	1.0	—	5.00	19.00	—	12.4
Blu-Ray player	17.0	—	0.4	5.00	—	19.00	34.0
Blu-Ray player, Energy Star	12.8	—	0.4	5.00	—	19.00	26.0
DVD player	11.5	—	1.8	5.00	—	19.00	34.0
DVD player, Energy Star	5.9	—	0.6	5.00	—	19.00	15.0
HD DVR set-top box	32.0	31.0	—	9.00	15.00	—	274.8
HD receiver set-top box	20.0	19.0	—	3.00	21.00	—	171.0
Satellite dish	15.0	—	—	4.02	—	19.98	22.0
Standard DVR set-top box	26.0	25.0	—	9.00	15.00	—	222.3
Standard receiver set-top box	16.0	15.0	—	3.00	21.00	—	132.5
VCR	11.0	—	—	1.99	—	22.01	8.0
Televisions							
CRT, 10-inch	55.0	—	1.0	5.00	—	19.00	107.3
CRT, 25-inch	95.0	—	2.0	5.00	—	19.00	187.2

CRT, 35-inch	162.0	—	2.0	5.00	—	19.00	309.5
CRT, 45-inch	298.0	—	4.0	5.00	—	19.00	571.6
CRT, 55-inch	400.0	—	8.0	5.00	—	19.00	785.5
CRT, >60-inch	474.0	—	17.0	5.00	—	19.00	982.9
LCD, 35-inch	65.0	—	0.4	5.00	—	19.00	121.4
LCD, 45-inch	110.0	—	0.4	5.00	—	19.00	203.5
LCD, 55-inch	165.0	—	0.4	5.00	—	19.00	303.9
LCD, >60-inch	190.0	—	0.4	5.00	—	20.00	349.7
LED, 45-inch	127.0	—	—	5.00	—	19.00	231.8
LED, 55-inch	155.0	—	—	5.00	—	19.00	282.9
Plasma, 35-inch	65.0	—	0.1	5.00	—	19.00	119.3
Plasma, 45-inch	110.0	—	0.1	5.00	—	19.00	201.4
Plasma, 55-inch	165.0	—	0.1	5.00	—	19.00	301.8
Plasma, >60-inch	190.0	—	0.1	5.00	—	19.00	347.4
Rear-projection	200.0	—	—	5.00	—	19.00	365.0
Video game consoles							
Microsoft Xbox (2001), turned off when not in use	64.0	59.9	1.7	5.75	—	18.25	145.8
Microsoft Xbox (2001), left on when not in use	64.0	59.9	1.7	5.75	18.25	—	533.3
Microsoft Xbox 360 (2007), turned off when not in use	118.8	117.5	3.1	5.75	—	18.25	270.0
Microsoft Xbox 360 (2007), left on when not in use	118.8	117.5	3.1	5.75	18.25	—	1032.0
Microsoft Xbox 360 (2010), turned off when not in use	87.9	—	—	5.75	—	18.25	184.5
Microsoft Xbox 360 (2010), left on when not in use	87.9	—	—	5.75	18.25	—	—
Nintendo 64 (1996), turned off when not in use	7.3	7.8	1.1	5.75	—	18.25	22.6
Nintendo 64 (1996), left on when not in use	7.3	7.8	1.1	5.75	18.25	—	67.3
Nintendo GameCube (2000), turned off when not in use	23.0	22.7	0.7	5.75	—	18.25	52.9
Nintendo GameCube (2000), left on when not in use	23.0	22.7	0.7	5.75	18.25	—	199.5
Nintendo Wii (2006), turned off when not in use	16.4	10.5	1.9	5.75	—	18.25	47.1
Nintendo Wii (2006), left on when not in use	16.4	10.5	1.9	5.75	18.25	—	104.4
Nintendo Wii (2010), turned off when not in use	13.7	—	—	5.75	—	18.25	28.8
Nintendo Wii (2010), left on when not in use	13.7	—	—	5.75	18.25	—	—
Sony PlayStation (1994), turned off when not in use	8.0	6.5	1.4	5.75	—	18.25	26.1
Sony PlayStation (1994), left on when not in use	8.0	6.5	1.4	5.75	18.25	—	60.1
Sony PlayStation 2 (2000), turned off when not in use	24.2	24.2	1.7	5.75	—	18.25	62.1
Sony PlayStation 2 (2000), left on when not in use	24.2	24.2	1.7	5.75	18.25	—	212.0
Sony PlayStation 3 (2007), turned off when not in use	150.1	152.9	1.1	5.75	—	18.25	322.3
Sony PlayStation 3 (2007), left on when not in use	150.1	152.9	1.1	5.75	18.25	—	1333.5
Sony PlayStation 3 (2010), turned off when not in use	84.8	—	—	5.75	—	18.25	178.0
Sony PlayStation 3 (2010), left on when not in use	84.8	—	—	5.75	18.25	—	—
Super Nintendo (1991), turned off when not in use	7.3	5.4	1.5	5.75	—	18.25	25.3
Super Nintendo (1991), left on when not in use	7.3	5.4	1.5	5.75	18.25	—	51.3

Notes: — = no data; CRT = cathode ray tube; DVR = digital video recorder; kWh = kilowatt-hour; LCD = liquid crystal display; LED = light-emitting diode; W = watt.

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