Xerox WorkCentre 7428 vs. Competitive Color MFPs

Canon Color imageRUNNER C2550

Canon Color imageRUNNER C3080i

Konica Minolta bizhub C253

Ricoh Aficio MP C2550

Sharp MX-C311

Xerox WorkCentre 7428

TEST OBJECTIVE

Conduct a comparative energy consumption evaluation of Xerox's WorkCentre 7428 vs. the competitive devices noted herein based on BLI's proprietary test methods. Competitive devices include the Canon Color imageRUNNER C2550, Canon Color imageRUNNER C3080i, Konica Minolta bizhub C253, Ricoh Aficio MP C2550 and Sharp MX-C311.

TEST METHODOLOGY

For each device energy consumption was measured using BLI's job stream test suite, a real-world four-hour test that begins with warm-up from overnight sleep mode and encompasses all modes, including simplex black and color print, duplex black and color print, idle, energy-save (if applicable) and sleep modes and warming up from these modes. The number of pages printed was based on the average monthly volumes for each device (determined by its speed range). All devices were configured the same and were tested with their most energy-efficient settings activated (for instance, set to go into the best energy-save and deepest sleep mode as quickly as possible after printing). Results of the test are used to calculate projected annual energy consumption and cost, including nights and weekends.
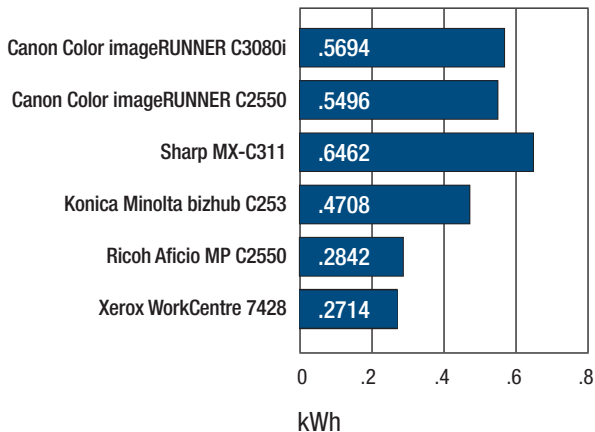
PERFORMANCE OVERVIEW

When running BLI's environmental job stream test, which replicates real-world usage, The Xerox WorkCentre 7428 consumed the least amount of energy of the competitive devices tested. Indeed, the WorkCentre 7428's projected annual energy cost is more than 60% less than the average of tested devices and it consumes only about a quarter of the energy of the unit with the highest tested energy consumption.
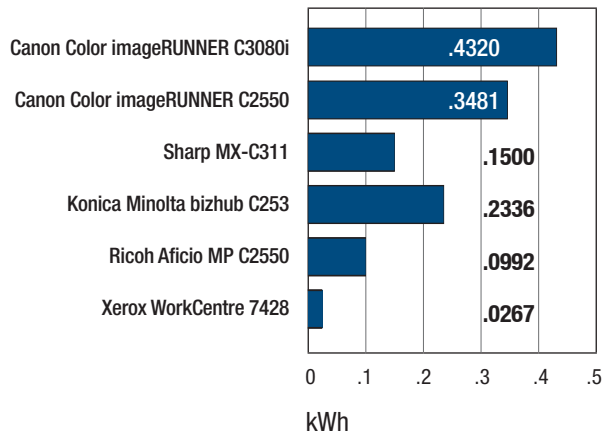
The tests also show that the Xerox model achieves its energy consumption advantages without sacrificing productivity. In fact, the WorkCentre 7428 has a faster than average tested recovery time from sleep mode, which was tested after the unit remained dormant overnight and after the unit went into sleep mode during the day. Plus, the WorkCentre 7428 goes into sleep mode faster than some other units tested, which also helps lower its overall energy consumption.

In addition, the WorkCentre 7428's higher-speed sister model, the WorkCentre 7435, consumed less energy than all other tested devices during BLI's environmental job stream test. Based on these findings, it is BLI's conclusion that, although not tested in our lab, the lower-speed WorkCentre 7425, which uses the same engine as the WorkCentre 7435/7428 Series, will be able to achieve similar results.
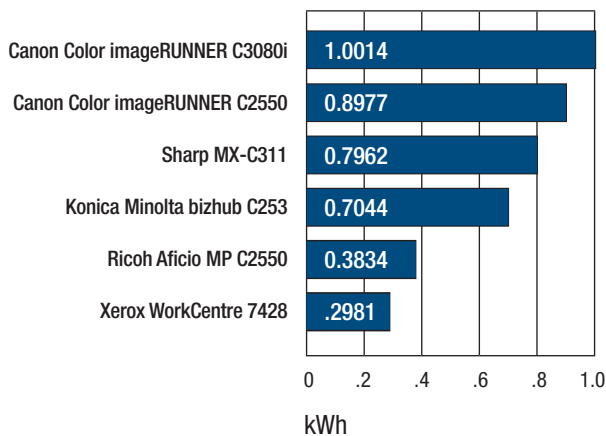
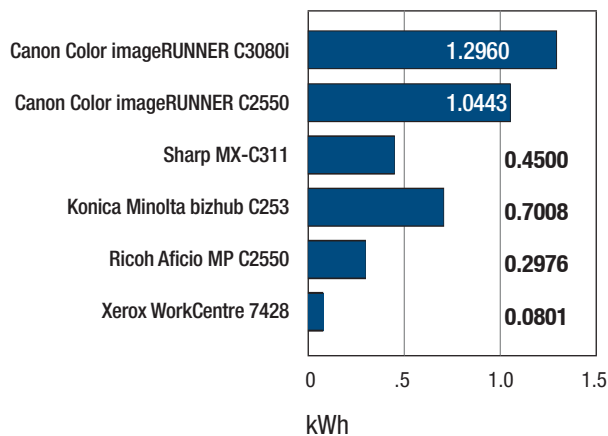## ENERGY CONSUMPTION DURING AN EIGHT-HOUR BUSINESS DAY

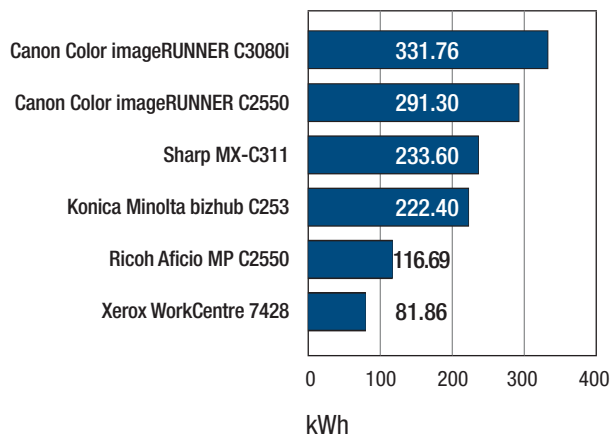| Model	kWh
Canon Color imageRUNNER C3080i	.5694
Canon Color imageRUNNER C2550	.5496
Sharp MX-C311	.6462
Konica Minolta bizhub C253	.4708
Ricoh Aficio MP C2550	.2842
Xerox WorkCentre 7428	.2714

16-HOUR SLEEP MODE ENERGY CONSUMPTION

Model	kWh
Canon Color imageRUNNER C3080i	.4320
Canon Color imageRUNNER C2550	.3481
Sharp MX-C311	.1500
Konica Minolta bizhub C253	.2336
Ricoh Aficio MP C2550	.0992
Xerox WorkCentre 7428	.0267

24-HOUR BUSINESS DAY ENERGY CONSUMPTION
(INCLUDING 16-HOUR SLEEP MODE ENERGY)

Model	kWh
Canon Color imageRUNNER C3080i	1.0014
Canon Color imageRUNNER C2550	0.8977
Sharp MX-C311	0.7962
Konica Minolta bizhub C253	0.7044
Ricoh Aficio MP C2550	0.3834
Xerox WorkCentre 7428	.2981

WEEKEND ENERGY CONSUMPTION

Model	kWh
Canon Color imageRUNNER C3080i	1.2960
Canon Color imageRUNNER C2550	1.0443
Sharp MX-C311	0.4500
Konica Minolta bizhub C253	0.7008
Ricoh Aficio MP C2550	0.2976
Xerox WorkCentre 7428	0.0801

ANNUAL ENERGY CONSUMPTION

Model	kWh
Canon Color imageRUNNER C3080i	331.76
Canon Color imageRUNNER C2550	291.30
Sharp MX-C311	233.60
Konica Minolta bizhub C253	222.40
Ricoh Aficio MP C2550	116.69
Xerox WorkCentre 7428	81.86

## PROJECTED ANNUAL ENERGY COSTS

The costs in the following table represent annual energy cost projections based on conducting BLI's Job Stream Matrix over four hours. Included in the projection is the cost of power for the device while in sleep mode 16 hours daily and over the weekend. To calculate usage over an eight-hour workday, the total energy consumed after four hours of testing is multiplied by two. Total yearly energy consumption is calculated based on the total energy used during a typical eight-hour day, plus overnight and weekend sleep energy. The energy costs are based on the January 2009 energy rate for the United States: USD: $0.1061.
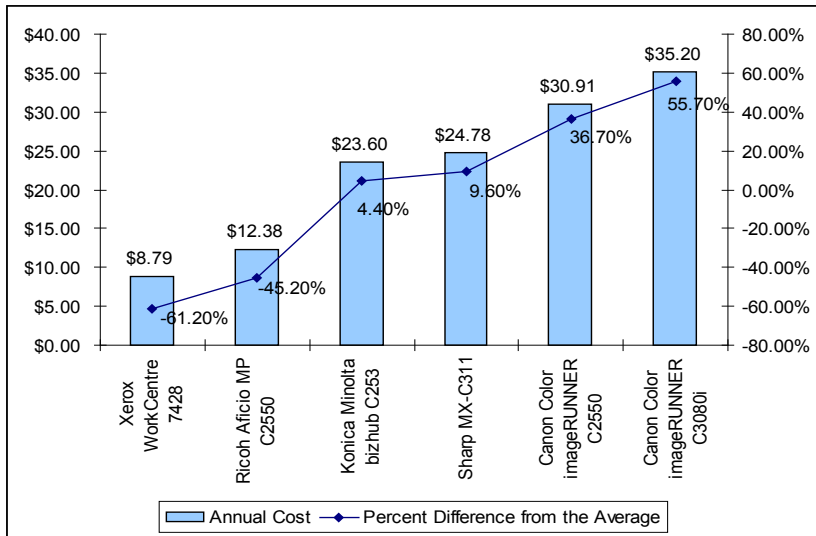
RECOVERY TIME (IN SECONDS)

Recovery time is tested separately from the Job Stream tests. To test the unit's recovery time from idle mode and its various energy-save and sleep modes, a single page is sent to the device after being in idle mode for 30 seconds, energy-save mode for five minutes, sleep mode for 15 minutes and again after being in sleep mode overnight (about 12 hours). The devices are set to go into energy-save mode and sleep mode after the shortest intervals of time possible.
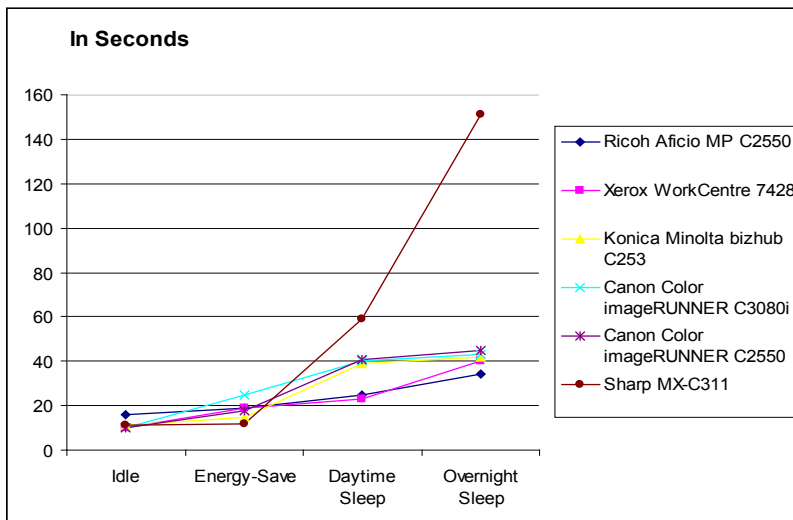
TIME REQUIRED TO ENTER SLEEP MODE

After programming each device to enter sleep mode after the shortest intervals of time possible, the first Job Stream test document was sent to each device and the time taken to go into sleep mode was recorded. The Xerox, Ricoh and Sharp devices were able to be programmed to go into sleep mode after one minute of non-use, while the Konica Minolta device was able to be programmed to go into sleep mode after two minutes of non-use.

Although both Canon devices could be programmed to go into sleep mode after 10 minutes of non-use, which is the shortest interval of time possible, they were unable to go into sleep mode during testing. No other devices tested had this problem.

	Shortest Recorded Time to Sleep Mode
Xerox WorkCentre 7428	**1 minute**
Ricoh Aficio MP C2550	1 minute
Sharp MX-C311	1 minute
Konica Minolta bizhub C253	2 minutes
Canon Color imageRUNNER C3080i	*
Canon Color imageRUNNER C2550	*

* Both Canon devices were unable to enter sleep mode after their shortest programmed times of 10 minutes. Instead, both Canon devices went into their best energy-save mode after 5 minutes, which is the best energy-save settings available, and remained there. Energy-save mode uses more energy than sleep mode.

SUPPORTING TEST DATA

PROJECTED ANNUAL ENERGY CONSUMPTION/COSTS

	Annual Energy Consumption (kWh)	Annual Cost	% Difference in Annual Cost from the Competitive Average
Xerox WorkCentre 7428	**82.86**	**$8.79**	**-61.2%**
Ricoh Aficio MP C2550	116.69	$12.38	-45.2%
Konica Minolta bizhub C253	222.40	$23.60	4.4%
Sharp MX-C311	233.60	$24.78	9.6%
Canon Color imageRUNNER C2550	291.30	$30.91	36.7%
Canon Color imageRUNNER C3080i	331.76	$35.20	55.7%
Competitive Average	213.10	$22.61	

RECOVERY TIME (IN SECONDS)

	Idle	Energy-Save	Daytime Sleep	Overnight Sleep
Ricoh Aficio MP C2550	16	19	25	34
Xerox WorkCentre 7428	**10**	**19**	**23**	**40**
Konica Minolta bizhub C253	11	15	39	42
Canon Color imageRUNNER C3080i	10	25	40	43
Canon Color imageRUNNER C2550	10	18	41	45
Sharp MX-C311	11	12	59	151
Competitive Average	11.3	18.0	37.8	59.2

Job Stream Tests

The following tables represent the kWh consumed when printing six sets of BLI's multi-page job stream test suite over a four-hour period, with the machine set to go into its energy-save and/or sleep modes at the shortest intervals possible. The test suite consists of Word documents, Outlook e-mail messages, Excel spreadsheets, PowerPoint, HTML and Acrobat PDF files. The table also details BLI's Job Stream Test schedule, including the start time, duration and energy consumption of each task. Actual usage may vary.

Note that the energy consumed between jobs represents a combination of idle, energy-save and/or sleep modes. Therefore, only two energy measurements are shown for each job in the Energy Consumed column: the print job's energy consumption and the overall energy consumed after the job finishes. Slight variations in energy readings between jobs may occur.

XEROX WORKCENTRE 7428 JOB STREAM TEST

Start Time	Device Operation	Time Required	Energy Consumed (kWh)
8:00:00 AM	Warm-up from Overnight Sleep	:40	0.0108
8:00:40	Print Simplex Black Job Stream	:39	0.0076
8:01:19	Idle Mode	1:00	
8:02:19	Daytime Sleep	14:00	0.0028
8:16:19	Print Duplex Black Job Stream	1:24	0.0171
8:17:43	Idle Mode	1:00	
8:18:43	Daytime Sleep	29:00	0.0053
8:47:43	Print Simplex Color Job Stream	1:08	0.0160
8:48:51	Idle Mode	1:00	
8:49:51	Daytime Sleep	14:00	0.0029
9:03:51	Print Duplex Color Job Stream	1:23	0.0181
9:05:14	Idle Mode	1:00	
9:06:14	Daytime Sleep	59:00	0.0079
10:05:14	Print Simplex Black Job Stream	1:09	0.0157
10:06:23	Idle Mode	1:00	
10:07:23	Daytime Sleep	14:00	0.0033
10:21:23	Print Duplex Black Job Stream	1:23	0.0169
10:22:46	Idle Mode	1:00	
10:23:46	Daytime Sleep	(sleep until end of 4-hour test)	0.0113
TOTAL 4-HOUR ENERGY CONSUMPTION			**0.1357 kWh**

PROJECTED ANNUAL ENERGY CONSUMPTION BASED ON JOB STREAM PERFORMANCE (KWH)

Weekday Consumption	
Eight-Hour Business Day (4-hour total x 2)	0.2714
16 Hours Overnight Sleep	0.0267
24-Hour Weekday Energy Consumed	0.2981
Total Annual Weekday Energy Consumed (weekday energy x 22 days in a month x 12 months in a year)	78.6984
Weekend Consumption	
48-Hour Weekend Energy Consumed	0.0801
Total Annual Weekend Energy Consumed (weekend energy x 52 weekends in a year)	4.1700
TOTAL ANNUAL ENERGY CONSUMED	**82.86 kWh**

RICOH AFICIO MP C2550 JOB STREAM TEST

Start Time	Device Operation	Time Required	Energy Consumed (kWh)
8:00:00 AM	Warm-up from Overnight Sleep	:34	0.0100
8:00:34	Print Simplex Black Job Stream	1:01	0.0069
8:01:35	Idle Mode	1:00	
8:02:35	Daytime Sleep	14:00	0.0026
8:16:35	Print Duplex Black Job Stream	1:18	0.0167
8:17:53	Idle Mode	1:00	
8:18:53	Daytime Sleep	29:00	0.0042
8:47:53	Print Simplex Color Job Stream	1:17	0.0205
8:49:10	Idle Mode	1:00	
8:50:10	Daytime Sleep	14:00	0.0028
9:04:10	Print Duplex Color Job Stream	1:25	0.0209
9:05:35	Idle Mode	1:00	
9:06:35	Daytime Sleep	59:00	0.0072
10:05:35	Print Simplex Black Job Stream	1:20	0.0173
10:06:55	Idle Mode	1:00	
10:07:55	Daytime Sleep	14:00	0.0034
10:21:55	Print Duplex Black Job Stream	1:22	0.0183
10:23:17	Idle Mode	1:00	
10:24:17	Daytime Sleep	(sleep until end of 4-hour test)	0.0113
TOTAL 4-HOUR ENERGY CONSUMPTION:			**0.1421 kWh**

PROJECTED ANNUAL ENERGY CONSUMPTION
BASED ON JOB STREAM PERFORMANCE (KWH)

Weekday Consumption	
Eight-Hour Business Day (4-hour total x 2)	0.2842
16 Hours Overnight Sleep	0.0992
24-Hour Weekday Energy Consumed	0.3834
Total Annual Weekday Energy Consumed (weekday energy x 22 days in a month x 12 months in a year)	101.2176
Weekend Consumption	
48-Hour Weekend Energy Consumed	0.2976
Total Annual Weekend Energy Consumed (weekend energy x 52 weekends in a year)	15.48
TOTAL ANNUAL ENERGY CONSUMED	**116.69 kWh**

KONICA MINOLTA BIZHUB C253 JOB STREAM TEST

Start Time	Device Operation	Time Required	Energy Consumed (kWh)
8:00:00 AM	Warm-up from Overnight Sleep	:42	0.0088
8:00:42	Print Simplex Black Job Stream	:58	0.0127
8:01:40	Idle Mode	2:00	
8:03:40	Daytime Sleep	13:00	0.0032
8:16:40	Print Duplex Black Job Stream	1:22	0.023
8:18:02	Idle Mode	2:00	
8:20:02	Daytime Sleep	28:00	0.0117
8:48:02	Print Simplex Color Job Stream	:58	0.0248
8:49:00	Idle Mode	2:00	
8:51:00	Daytime Sleep	13:00	0.0091
9:04:00	Print Duplex Color Job Stream	1:22	0.0269
9:05:22	Idle Mode	2:00	
9:07:22	Daytime Sleep	58:00	0.0189
10:05:22	Print Simplex Black Job Stream	:58	0.0215
10:06:20	Idle Mode	2:00	
10:08:20	Daytime Sleep	13:00	0.0103
10:21:20	Print Duplex Black Job Stream	1:22	0.0265
10:22:42	Idle Mode	2:00	
10:24:42	Daytime Sleep	(sleep until end of 4-hour test)	0.038
TOTAL 4-HOUR ENERGY CONSUMPTION:			**0.2354 kWh**

PROJECTED ANNUAL ENERGY CONSUMPTION
BASED ON JOB STREAM PERFORMANCE (KWH)

Weekday Consumption	
Eight-Hour Business Day (4-hour total x 2)	0.4708
16 Hours Overnight Sleep	0.2336
24-Hour Weekday Energy Consumed	0.7044
Total Annual Weekday Energy Consumed (weekday energy x 22 days in a month x 12 months in a year)	185.9616
Weekend Consumption	
48-Hour Weekend Energy Consumed	0.7008
Total Annual Weekend Energy Consumed (weekend energy x 52 weekends in a year)	36.44
TOTAL ANNUAL ENERGY CONSUMED	**222.40 kWh**

SHARP MX-C311 JOB STREAM TEST

Start Time	Device Operation	Time Required	Energy Consumed (kWh)
8:00:00 AM	Warm-up from Overnight Sleep	2:27	0.0463
8:02:27	Print Simplex Black Job Stream	:54	0.0108
8:03:21	Idle Mode	1:00	
8:04:21	Daytime Sleep	14:00	0.0088
8:18:21	Print Duplex Black Job Stream	2:30	0.0344
8:20:51	Idle Mode	1:00	
8:21:51	Daytime Sleep	29:00	0.0125
8:50:51	Print Simplex Color Job Stream	2:21	0.0402
8:53:12	Idle Mode	1:00	
8:54:12	Daytime Sleep	14:00	0.0064
9:08:12	Print Duplex Color Job Stream	2:32	0.0351
9:10:44	Idle Mode	1:00	
9:11:44	Daytime Sleep	59:00	0.0176
10:10:44	Print Simplex Black Job Stream	2:36	0.0463
10:13:20	Idle Mode	1:00	
10:14:20	Daytime Sleep	14:00	0.0072
10:28:20	Print Duplex Black Job Stream	2:24	0.0333
10:30:44	Idle Mode	1:00	
10:31:44	Daytime Sleep	(sleep until end of 4-hour test)	0.0242
TOTAL 4-HOUR ENERGY CONSUMPTION:			**0.3231 kWh**

PROJECTED ANNUAL ENERGY CONSUMPTION
BASED ON JOB STREAM PERFORMANCE (KWH)

Weekday Consumption	
Eight-Hour Business Day (4-hour total x 2)	0.6462
16 Hours Overnight Sleep	0.1500
24-Hour Weekday Energy Consumed	0.7962
Total Annual Weekday Energy Consumed (weekday energy x 22 days in a month x 12 months in a year)	210.1968
Weekend Consumption	
48-Hour Weekend Energy Consumed	0.4500
Total Annual Weekend Energy Consumed (weekend energy x 52 weekends in a year)	23.400
TOTAL ANNUAL ENERGY CONSUMED	**233.60 kWh**

CANON COLOR IMAGERUNNER C2550 JOB STREAM TEST

Start Time	Device Operation	Time Required	Energy Consumed (kWh)
8:00:00 AM	Warm-up from Overnight Sleep	:45	0.0054
8:00:45	Print Simplex Black Job Stream	:43	0.0104
8:01:28	Idle Mode	5:00	
8:06:28	Energy-Save Mode	10:00	0.0153
8:16:28	Print Duplex Black Job Stream	1:41	0.0222
8:18:09	Idle Mode	5:00	
8:23:09	Energy-Save Mode	25:00	0.0218
8:48:09	Print Simplex Color Job Stream	1:05	0.0151
8:49:14	Idle Mode	5:00	
8:54:14	Energy-Save Mode	10:00	0.0154
9:04:14	Print Duplex Color Job Stream	1:59	0.0248
9:06:13	Idle Mode	5:00	
9:11:13	Energy-Save Mode	55:00	0.0352
10:06:13	Print Simplex Black Job Stream	1:26	0.0150
10:07:39	Idle Mode	5:00	
10:12:39	Energy-Save Mode	10:00	0.0152
10:22:39	Print Duplex Black Job Stream	1:42	0.0214
10:24:21	Idle Mode	5:00	
10:29:21	Energy-Save Mode	(energy-save* until end of 4-hour test)	0.0576
TOTAL 4-HOUR ENERGY CONSUMPTION			**0.2748 kWh**

* Unlike other units tested, the Canon Color imageRUNNER C2550 was unable to go into sleep mode during the Job Stream test.

PROJECTED ANNUAL ENERGY CONSUMPTION
BASED ON JOB STREAM PERFORMANCE (KWH)

Weekday Consumption	
Eight-Hour Business Day (4-hour total x 2)	0.5496
16 Hours Overnight Sleep	0.3481
24-Hour Weekday Energy Consumed	0.8977
Total Annual Weekday Energy Consumed (weekday energy x 22 days in a month x 12 months in a year)	236.9928
Weekend Consumption	
48-Hour Weekend Energy Consumed	1.0443
Total Annual Weekend Energy Consumed (weekend energy x 52 weekends in a year)	54.3036
TOTAL ANNUAL ENERGY CONSUMED	**291.30 kWh**

CANON COLOR IMAGERUNNER C3080I JOB STREAM TEST

Start Time	Device Operation	Time Required	Energy Consumed (kWh)
8:00:00 AM	Warm-up from Overnight Sleep	:43	0.0052
8:00:43	Print Simplex Black Job Stream	1:20	0.0084
8:02:03	Idle Mode	5:00	
8:07:03	Energy-Save Mode	10:00	0.0168
8:17:13	Print Duplex Black Job Stream	1:38	0.0214
8:18:51	Idle Mode	5:00	
8:23:51	Energy-Save Mode	25:00	0.024
8:48:51	Print Simplex Color Job Stream	:57	0.0135
8:49:48	Idle Mode	5:00	
8:54:48	Energy-Save Mode	10:00	0.0162
9:04:48	Print Duplex Color Job Stream	1:51	0.0253
9:06:39	Idle Mode	5:00	
9:11:39	Energy-Save Mode	55:00	0.0395
10:06:39	Print Simplex Black Job Stream	1:17	0.0136
10:07:56	Idle Mode	5:00	
10:12:56	Energy-Save Mode	10:00	0.016
10:22:56	Print Duplex Black Job Stream	1:38	0.0209
10:24:34	Idle Mode	5:00	
10:29:34	Energy-Save Mode	(energy-save* until end of 4-hour test)	0.0639
TOTAL 4-HOUR ENERGY CONSUMPTION			**0.2847 kWh**

* Unlike other units tested, the Canon Color imageRUNNER C3080i was unable to go into sleep mode during the Job Stream test.

PROJECTED ANNUAL ENERGY CONSUMPTION
BASED ON JOB STREAM PERFORMANCE (KWH)

Weekday Consumption	
Eight-Hour Business Day (4-hour total x 2)	0.5694
16 Hours Overnight Sleep	0.4320
24-Hour Weekday Energy Consumed	1.0014
Total Annual Weekday Energy Consumed (weekday energy x 22 days in a month x 12 months in a year)	264.3696
Weekend Consumption	
48-Hour Weekend Energy Consumed	1.2960
Total Annual Weekend Energy Consumed (weekend energy x 52 weekends in a year)	67.39
TOTAL ANNUAL ENERGY CONSUMED	**331.76 kWh**