

Savings Calculator for ENERGY STAR Qualified Office Equipment

This calculator was developed by U.S. EPA and DOE to estimate the energy consumption and operating costs of office equipment and the savings with ENERGY STAR. New ENERGY STAR qualified products are compared to the average available non-qualified new products. Actual savings may vary based on use and other factors. [See www.energystar.gov](http://www.energystar.gov) for information on other ENERGY STAR products. [See www.energystar.gov/rebate-finder](http://www.energystar.gov/rebate-finder) to find utility incentives for these products by entering your zip code. Enter these incentives in the "utility incentive" fields below.



Where will your equipment be used?

Commercial or residential use

Commercial

Location

Wisconsin

Electric rate (\$/kWh)

\$0.144

Average Wisconsin commercial electric rate is \$0.144/kWh. If you know your own rate, enter it below.

What office equipment are you planning to purchase? Enter quantities below, then either fill in product information or use the defaults.

Computer

Quantity	Performance level	Portion of units turned off at night	Portion of units with sleep settings / low power mode enabled	Additional cost per unit for ENERGY STAR qualified model
Desktop	Medium	36%	8%	\$0
Laptop	Medium	36%	8%	\$0

Display

Quantity	Diagonal screen size (inches)	Portion of units turned off at night	Portion of units with sleep settings / low power mode enabled	Additional cost per unit for ENERGY STAR qualified model
Computer Monitor	23.0 - 24.9 inches	18%	81%	\$0

Signage

Quantity	Diagonal screen size (inches)	Daily hours of active use	Daily hours of no use (sleep/off mode)	Additional cost per unit for ENERGY STAR qualified model
Professional Signage	45.0 - 49.9 inches	24.0	0.0	\$0

VoIP Phone

Quantity	Phone network capability	Additional cost per unit for ENERGY STAR qualified model
Desktop	Fast ethernet (10/100 base-T)	\$0
Conference	N/A	\$0

Multifunction Device

Quantity	Type	Speed (images per minute)	Wireless capability	Additional cost per unit for ENERGY STAR qualified model
Standard format	Laser Color	40	No	\$0
Large format	Ink Jet	Value not needed	No	\$0

Printer

Standard format	Laser monochrome	40	No	\$0
Small format	N/A	Value not needed	No	\$0
Large format	Ink Jet	Value not needed	No	\$0

Copier

Standard format	N/A	40	N/A	\$0
Large format	N/A	Value not needed	N/A	\$0

Fax Machine

0	N/A	15	N/A	\$0
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Scanner

2	FI-6130	Value not needed	No	\$0
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[Click here to go to the RESULTS tab and see your savings.](#)

For more detail on the formulas and values used in this calculator, click on the grey tabs at bottom of the page.

Savings Estimate for ENERGY STAR Qualified Office Equipment



Results Overview

The ENERGY STAR models of your selected equipment will save approximately 43%. Each year you will save approximately 20 kWh of electricity and \$0, or \$11 over the life of the equipment. By choosing ENERGY STAR you will reduce emissions by approximately 31 pounds of carbon dioxide annually. This is equivalent to the emissions reduction of not driving your car for 1 day.

Results Detail

	Quantity	Annual					% Savings with ENERGY STAR	Total additional purchase price for ENERGY STAR unit(s)	Simple payback period for additional initial cost (years)	Assumed equipment lifetime (years)	Life Cycle		
		Electricity cost savings	Electricity savings (kWh)	Electricity cost	Electricity consumption by ENERGY STAR unit(s) (kWh)	Emissions reduction (pounds of CO2)					Electricity cost savings	Electricity savings (kWh)	Net cost savings
Computer													
- Desktop	0												
- Laptop	0												
Display													
- Computer Monitor	0												
- Professional Signage	0												
VoIP Phone													
- Desktop	0												
- Conference	0												
Multifunction Device													
- Standard format	0												
- Large format	0												
Printer													
- Standard format	0												
- Small format	0												
- Large format	0												
Copier													
- Standard format	0												
- Large format	0												
FAX Machine	0												
Scanner	2	\$3	20	\$4	26	31	43%	\$0	immediate	4	\$11	81	\$11
Total	2	\$3	20	\$4	26	31	43%	\$0	immediate	-	\$11	81	\$11

If all office equipment sold in the United States was ENERGY STAR certified, the energy cost savings would grow to more than \$5 billion each year and 86 billion pounds of annual greenhouse gas emissions would be prevented, equivalent to the emissions from more than 8 million vehicles.

Notes: Life cycle costs are discounted over the product lifetime using a real discount rate of 4%. See General Assumptions tab to adjust the discount rate.
This calculator was developed by U.S. EPA and DOE to estimate the energy consumption and operating costs of office equipment and the savings with ENERGY STAR.
New ENERGY STAR certified products are compared to the average available non-certified new products. Actual savings may vary based on use and other factors.

Desktop Computer Calculations for the ENERGY STAR Office Equipment Calculator

INPUTS - to edit these values go to the INPUTS tab

	Defaults		User Entry
	Commercial	Residential	
Portion turned off at night	36%	78%	36%
Portion with sleep enabled	8%	15%	8%

Assumptions - users can edit the highlighted cells to modify the assumptions

Performance Level (see detailed descriptions below)	Conventional			ENERGY STAR		
	Idle wattage (W)	Sleep wattage (W)	Off wattage (W)	Idle wattage (W)	Sleep wattage (W)	Off wattage (W)
Low	33.80	2.03	1.01	15.45	1.27	0.78
Medium	48.11	2.31	0.96	27.11	1.80	0.81
High	53.04	2.70	1.07	31.54	2.47	0.87
Selected	48.11	2.31	0.96	27.11	1.80	0.81

Operation Profile	Commercial use			Residential use		
	Annual idle hours	Annual sleep hours	Annual off hours	Annual idle hours	Annual sleep hours	Annual off hours
Power managed, Turned off	803	1,104	6,854	1,059	1,241	6,461
Not power managed, Turned off	1,906	0	6,854	2,300	0	6,461
Power managed, Left on	803	7,957	0	1,059	7,702	0
Not power managed, Left on	8,760	0	0	8,760	0	0

	Annual idle hours	Annual sleep hours	Annual off hours
Annual operating hours - weighted average for selected scenario	5,853	439	2,467

Equipment lifetime (years)	4
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Annual electricity consumption per computer (kWh)

Conventional	ENERGY STAR	Savings
0	0	0

Emissions reduction per computer

Annual	0	pounds CO2
Life cycle	0	pounds CO2

References

Power:

- EPA research on available products, 2013

Turn-off rate:

- Default percentage of computers turned off each night is assumed based upon 2004 Lawrence Berkeley National Lab Report "After-hours Power Status of Office Equipment and Inventory of Miscellaneous Plug-Load Equipment"

Operating Hours:

- "Office Technology Energy Use and Savings Potential in New York." Piette, M. A., M. Cramer, J. Eto and J. Koomey. 1995. Prepared for the NY State Energy R&D Authority and Con-Ed by LBNL. Lawrence Berkeley Laboratory. LBL-36752. January 1995. p. 4-2.

Lifetime:

- [U.S. Department of Energy. energy conservation standards rulemaking analysis](#)

Definition of Performance Levels

Performance Levels Used in Calculator	ENERGY STAR Specification, Table 6		
	Category Name	Graphics Capability	Performance Score
Low	0	Any Graphics dGfx ≤ G7	$P \leq 3$
	I1	Integrated or Switchable Graphics	$3 < P \leq 6$
Medium	I2		$6 < P \leq 7$
High	I3	Discrete Graphics dGfx ≤ G7	$P > 7$
Medium	D1		$3 < P \leq 9$
High	D2		$P > 9$

Laptop Computer Calculations for the ENERGY STAR Office Equipment Calculator

INPUTS - to edit these values go to the INPUTS tab

	Defaults		User Entry
	Commercial	Residential	
Portion turned off at night	36%	78%	36%
Portion with sleep enabled	8%	15%	8%

Assumptions - users can edit the highlighted cells to modify the assumptions

Performance Level (see detailed descriptions below)	Conventional			ENERGY STAR		
	Idle wattage (W)	Sleep wattage (W)	Off wattage (W)	Idle wattage (W)	Sleep wattage (W)	Off wattage (W)
Low	11.04	1.04	0.56	6.40	0.79	0.38
Medium	14.82	1.21	0.61	8.61	0.89	0.46
High	17.24	1.34	0.62	10.24	1.22	0.52
Selected	14.82	1.21	0.61	8.61	0.89	0.46

Operation Profile	Commercial use			Residential use		
	Annual idle hours	Annual sleep hours	Annual off hours	Annual idle hours	Annual sleep hours	Annual off hours
Power managed, Turned off	803	1,104	6,854	1,059	1,241	6,461
Not power managed, Turned off	1,906	0	6,854	2,300	0	6,461
Power managed, Left on	803	7,957	0	1,059	7,702	0
Not power managed, Left on	8,760	0	0	8,760	0	0

	Annual idle hours	Annual sleep hours	Annual off hours
Annual operating hours - weighted average for selected scenario	5,853	439	2,467

Equipment lifetime (years)	4
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Annual electricity consumption per computer (kWh)

Conventional	ENERGY STAR	Savings
0	0	0

Emissions reduction per computer

Annual	0	pounds CO2
Life cycle	0	pounds CO2

References

- Power:
- EPA research on available products, 2013
- Turn-off rate:
- Default percentage of computers turned off each night is assumed based upon 2004 Lawrence Berkeley National Lab Report "After-hours Power Status of Office Equipment and Inventory of Miscellaneous Plug-Load Equipment"
- Operating Hours:
- "Office Technology Energy Use and Savings Potential in New York." Piette, M. A., M. Cramer, J. Eto and J. Koomey. 1995. Prepared for the NY State Energy R&D Authority and Con-Ed by LBNL. Lawrence Berkeley Laboratory. LBL-36752. January 1995. p. 4-2.
- Lifetime:
- [U.S. Department of Energy. energy conservation standards rulemaking analysis](#)

Definition of Performance Levels

Performance Levels Used in Calculator	ENERGY STAR Specification, Table 6		
	Category Name	Graphics Capability	Performance Score
Low	0	Any Graphics dGfx ≤ G7	$P \leq 2$
	I1	Integrated or Switchable Graphics	$2 < P \leq 5.2$
Medium	I2		$5.2 < P \leq 8$
High	I3	Discrete Graphics dGfx ≤ G7	$P > 8$
Medium	D1		$2 < P \leq 9$
High	D2		$P > 9$

Computer Monitor Calculations for the ENERGY STAR Office Equipment Calculator

INPUTS - to edit these values go to the INPUTS tab

	Default		User entry
	Commercial	Residential	
Diagonal screen size (inches)	23.0 - 24.9 inches		23.0 - 24.9 inches
Portion turned off at night	18%	100%	18%
Portion with sleep enabled	81%	40%	81%

Assumptions - users can edit the highlighted cells to modify the assumptions

Active wattage (W)	Diagonal screen size	Conventional	ENERGY STAR
	Less than 12 inches	6.6	5.0
	12.0 - 16.9 inches	8.2	5.8
	17.0 - 22.9 inches	16.3	12.9
	23.0 - 24.9 inches	20.3	17.2
	25.0 - 60.9 inches	33.1	24.5
	Selected	20.3	17.2
Sleep/Off wattage (W)	Less than 12 inches	0.48	0.25
	12.0 - 16.9 inches	0.46	0.43
	17.0 - 22.9 inches	0.27	0.24
	23.0 - 24.9 inches	0.32	0.28
	25.0 - 60.9 inches	0.37	0.29
	Selected	0.32	0.28

	Commercial use			Residential use		
	Annual active hours	Annual sleep hours	Annual off hours	Annual active hours	Annual sleep hours	Annual off hours
Power managed, turned off	803	1104	6854	1241	1095	6424
Not power managed, turned off	1906	0	6854	2336	0	6424
Power managed, left on	803	7957	0	1241	7519	0
Not power managed, left on	8760	0	0	8760	0	0

	Annual active hours	Annual sleep hours	Annual off hours
Annual operating hours - weighted average for selected scenario	2,450	5,154	1,156

Equipment lifetime (years)	Commercial	7
	Residential	7
	Selected	7

Annual electricity consumption per display (kWh)

Conventional	ENERGY STAR	Savings
52	44	8

Emissions reduction per display

Annual	12	pounds CO2
Life cycle	82	pounds CO2

References

Power:

[- ENERGY STAR level: ENERGY STAR V6.0 qualified product list using V7.0 specification requirements](#)
- Conventional: ENERGY STAR V6.0 qualified product list

Turn-off rate:

- Default percentage of computers turned off each night is assumed based upon 2004 Lawrence Berkeley National Lab Report "After-hours Power Status of Office Equipment and Inventory of Miscellaneous Plug-Load Equipment"

Operating Hours:

- "Office Technology Energy Use and Savings Potential in New York." Piette, M. A., M. Cramer, J. Eto and J. Koomey. 1995. Prepared for the NY State Energy R&D Authority and Con-Ed by LBNL. Lawrence Berkeley Laboratory. LBL-36752. January 1995. p. 4-2.

Lifetime:

- Review of primary RECS and CBECS data, extrapolated to 2015, and back-calculating lifetime, leading to a lifetime of 7 years (similar to TVs) and better agreement with estimates published elsewhere.

Professional Signage Calculations for the ENERGY STAR Office Equipment Calculator

INPUTS - to edit these values go to the INPUTS tab

	Default	User entry
Diagonal screen size (inches)	45.0 - 49.9 inches	45.0 - 49.9 inches
Hours in active mode	24.0	24.0
Hours in standby mode	0.0	0.0

Assumptions - users can edit the highlighted cells to modify the assumptions

Active wattage (W)	Diagonal screen size	Conventional	ENERGY STAR
	Less than 35 inches	54.6	37.3
	35.0 - 44.9 inches	93.3	65.8
	45.0 - 49.9 inches	120.8	79.3
	50.0 - 60.0 inches	152.2	104.2
	Selected	120.8	79.3
Sleep/Off wattage (W)	Less than 35 inches	0.31	0.29
	35.0 - 44.9 inches	0.37	0.32
	45.0 - 49.9 inches	0.40	0.33
	50.0 - 60.0 inches	0.39	0.33
	Selected	0.40	0.33

Annual active hours	8,760
Annual sleep/off hours	0
Equipment lifetime (years)	4

Annual electricity consumption per display (kWh)

Conventional	ENERGY STAR	Savings
1,059	695	364

Emissions reduction per display

Annual	560	pounds CO2
Life cycle	2,240	pounds CO2

References

- Power:
- [ENERGY STAR level: ENERGY STAR V6.0 qualified product list using V7.0 specification requirements](#)

- [Conventional: ENERGY STAR V6.0 qualified product list](#)
- Lifetime:
- ["Efficiency Improvements in U.S. Office Equipment: Expected Policy Impacts and Uncertainties", Koomey, Cramer, Piette, Eto. Lawrence Berkeley National Laboratory. 1995. Table 3.](#)

Phone Calculations for the ENERGY STAR Office Equipment Calculator

Assumptions - users can edit the highlighted cells to modify the assumptions

Power (W)			Conventional	ENERGY STAR
	Desktop	Fast ethernet	3.2	2.0
		Gigabit ethernet	5.0	3.0
	Conference		3.9	2.5

Annual operation (hours)	8,760
Equipment lifetime (years)	7

Annual electricity consumption per phone (kWh)

	Conventional	ENERGY STAR	Savings
Desktop	28	18	11
Conference	34	22	12

Emissions reduction per phone

Annual	Desktop	16	pounds CO2
	Conference	19	
Life cycle	Desktop	113	
	Conference	132	

References

- Power: ENERGY STAR - [ENERGY STAR specification](#)
 Conventional - EPA research on available products, 2013
- Lifetime: - Appliance Magazine, Portrait of the U.S. Appliance Industry 1998

Multifunction Device Calculations for the ENERGY STAR Office Equipment Calculator

Inputs - to edit these values go to the INPUTS tab

		Options	User Entry
Type	Standard format	Laser Color	Laser Color
		Laser Monochrome	
		Ink Jet	
		Other Color	
	Large format	Ink Jet	Ink Jet
		Other	

		Default	User Entry
Speed (images per minute)	Standard format	40	40
Wireless capability	Standard format	-	No

Assumptions - users can edit the highlighted cells to modify the assumptions

	Type		Conventional		ENERGY STAR	
			Sleep Mode	Standby Mode	Sleep Mode	Standby Mode
Power (W)	Standard format	Base - Ink Jet	1.4	1.0	0.6	0.5
		Wireless adder	2.0	-	2.0	-
	Large format	Base - Ink Jet	15.0	1.0	4.9	0.5
		Base - Other	30.0	1.0	8.2	0.5

	Type		Speed	Conventional	ENERGY STAR
			s ≤ 5	1.5	0.4
	Electricity Consumption (kWh/week)	Monochrome	5 < s ≤ 10	1.5	2.0
			10 < s ≤ 26	4.5	2.9
			26 < s ≤ 30	8.0	2.9
			30 < s ≤ 50	6.0	3.3
			50 < s ≤ 68	6.0	1.9
			68 < s ≤ 80	-2.0	1.9
			s > 80	-2.0	-12.2
		Color	s ≤ 10	7.5	1.5
			10 < s ≤ 15	7.5	4.5
			15 < s ≤ 26	7.5	5.3
			26 < s ≤ 30	11.0	5.3
			30 < s ≤ 62	11.0	6.0
			62 < s ≤ 70	3.0	6.0
			70 < s ≤ 80	3.0	-9.1
			s > 80	3.0	-11.1
		Ink Jet		0.2	0.1
		Selected		11.0	6.0
		Large format		1.34	0.45

	Sleep Mode	Standby Mode
Weekly operation (hours)	84	84

Weeks per year	52.1
Equipment lifetime (years)	6

Annual electricity consumption per MFD (kWh)

	Conventional	ENERGY STAR	Savings
Standard format	0	310	-310
Large format	0	0	0

Emissions reduction per MFD

Annual	Standard Format	-478	pounds CO2
	Large Format	0	
Life cycle	Standard Format	-2,867	
	Large Format	0	

References

- Energy:

- [ENERGY STAR level: ENERGY STAR specification V2.0](#)
- [Conventional: ENERGY STAR specification V1.1](#)
- Lifetime:

- ["Efficiency Improvements in U.S. Office Equipment: Expected Policy Impacts and Uncertainties". Koomey, Cramer, Piette, Eto. Lawrence Berkeley National Laboratory. 1995. Tabl](#)

kWh/week Consumption Algorithms				
Type		Speed	Conventional	ENERGY STAR
Standard format	Monochrome	s ≤ 5	1.5	0.4
		5 < s ≤ 10	1.5	0.07 x Speed + 0.05
		10 < s ≤ 26	0.1 x Speed + 0.5	0.07 x Speed + 0.05
		26 < s ≤ 30	0.35 x Speed - 6.0	0.07 x Speed + 0.05
		30 < s ≤ 50	0.35 x Speed - 6.0	0.11 x Speed - 1.15
		50 < s ≤ 68	0.35 x Speed - 6.0	0.25 x Speed - 8.15
		68 < s ≤ 80	0.7 x Speed - 30.0	0.25 x Speed - 8.15
		s > 80	0.7 x Speed - 30.0	0.6 x Speed - 36.15
	Color	s ≤ 10	0.1 x Speed + 3.5	1.5
		10 < s ≤ 15	0.1 x Speed + 3.5	0.1 x Speed + 0.5
		15 < s ≤ 26	0.1 x Speed + 3.5	0.13 x Speed + 0.05
		26 < s ≤ 30	0.35 x Speed - 3.0	0.13 x Speed + 0.05
		30 < s ≤ 62	0.35 x Speed - 3.0	0.2 x Speed- 2.05
		62 < s ≤ 70	0.7 x Speed - 25.0	0.2 x Speed- 2.05
		70 < s ≤ 80	0.7 x Speed - 25.0	0.7 x Speed - 37.05
		s > 80	0.7 x Speed - 25.0	0.75 x Speed - 41.05
	Ink Jet		[(Watts _{Sleep} + (Wireless ₀₁ x WirelessAdder)) x Hours _{Sleep} + Watts _{Standby} x Hours _{Standby}] / (1,000 Wh/kWh)	
	Large format		(((Watts _{Sleep} x Hours _{Sleep}) + (Watts _{Standby} x Hours _{Standby})) / (1,000 Wh/kWh)	

Printer Calculations for the ENERGY STAR Office Equipment Calculator

Inputs - to edit these values go to the INPUTS tab

		Default	User Entry
Speed (images per minute)	Standard format	40	40
	Standard format	-	No
	Small format	-	No
Wireless capability	Large format	-	No
Type	Standard format	Options	User Entry
		Laser color	Laser monochrome
		Laser monochrome	
		Ink Jet	
		Impact	
		Other color	
		Other monochrome	
	Large format	Ink Jet	Ink Jet
		Other	

Assumptions - users can edit the highlighted cells to modify the assumptions

	Type	Conventional		ENERGY STAR	
		Sleep Mode	Standby Mode	Sleep Mode	Standby Mode
Power (W)	Standard format	Base - Ink Jet	1.4	1.0	0.6
		Base - Impact	4.6	1.0	0.6
		Wireless adder	2.0	-	-
	Small format	Base	9.0	1.0	4.0
		Wireless adder	2.0	-	2.0
	Large format	Base - Ink Jet	15.0	1.0	4.9
		Base - Other	14.0	1.0	2.5
		Wireless adder	2.0	-	2.0

	Type		Speed	Conventional	ENERGY STAR
Electricity Consumption (kWh/week)	Standard format	Monochrome	s ≤ 5	1.0	0.3
			5 < s ≤ 15		1.7
			15 < s ≤ 20		
			20 < s ≤ 30	3.5	2.1
			30 < s ≤ 40		2.6
			40 < s ≤ 65		2.6
			65 < s ≤ 82	3.7	1.6
			82 < s ≤ 90		
			s > 90	-11.0	-15.9
		Color	s ≤ 10	6.8	1.3
			10 < s ≤ 15		3.1
			15 < s ≤ 30		5.4
			30 < s ≤ 32		
			32 < s ≤ 58	8.8	5.9
			58 < s ≤ 75	2.0	
			s > 75		-11.7
		Ink Jet		0.2	0.1
		Impact		0.5	0.1
		Selected		3.5	2.6
	Small format			0.8	0.4
	Large format			1.3	0.5

	Sleep Mode	Standby Mode
Weekly operation (hours)	84	84
Weeks per year	52.1	
Equipment lifetime (years)	6	

Annual electricity consumption per printer (kWh)

	Conventional	ENERGY STAR	Savings
Standard format	0	136	-136
Small format	0	20	-20
Large format	0	24	-24

Emissions reduction per printer

Annual	Standard Format	-209	pounds CO2
	Small Format	-30	
	Large Format	-36	
Life cycle	Standard Format	-1,253	
	Small Format	-182	
	Large Format	-219	

References

- Energy:
 - ENERGY STAR level: [ENERGY STAR specification V2.0](#)
 - Conventional: [ENERGY STAR specification V1.1](#)
- Lifetime:
 - Market research by Lawrence Berkeley National Laboratory, 2009

Copier Calculations for the ENERGY STAR Office Equipment Calculator

Inputs - to edit these values go to the INPUTS tab

		Default	User Entry
Speed (images per minute)	Standard	40	40

Assumptions - users can edit the highlighted cells to modify the assumptions

	Type	Conventional		ENERGY STAR	
		Sleep Mode	Standby Mode	Sleep Mode	Standby Mode
Power (W)	Large format	30.0	1.0	8.2	0.5

		Speed	Conventional	ENERGY STAR
Electricity Consumption (kWh/week)	Standard	s ≤ 5	1.0	0.3
		5 < s ≤ 15	1.0	1.7
		15 < s ≤ 20	3.5	1.7
		20 < s ≤ 30	3.5	2.1
		30 < s ≤ 40	3.5	2.6
		40 < s ≤ 65	3.7	2.6
		65 < s ≤ 82	3.7	1.6
		82 < s ≤ 90	-11.0	1.6
		s > 90	-11.0	-15.9
		selected	3.5	2.6
Large			2.6	0.7

	Sleep Mode	Standby Mode
Weekly operation (hours)	84	84

Weeks per year	52.1
Equipment lifetime (years)	6

Annual electricity consumption per copier (kWh)

	Conventional	ENERGY STAR	Savings
Standard Format	183	136	47
Large Format	136	38	98

Emissions reduction per copier

Annual	Standard Format	72	pounds CO2
	Large Format	150	
Life cycle	Standard Format	434	
	Large Format	903	

References

Energy:

[- ENERGY STAR level: ENERGY STAR specification V2.0](#)
[- Conventional: ENERGY STAR specification V1.1](#)

Lifetime:

[- "Efficiency Improvements in U.S. Office Equipment: Expected Policy Impacts and Uncertainties", Koomey, Cramer, Piette, Eto. Lawrence Berkeley National Laboratory. 1995. Table 3.](#)

Fax Machine Calculations for the ENERGY STAR Office Equipment Calculator

Inputs - to edit these values go to the INPUTS tab

		Default	User Entry
Speed (images per minute)	Standard	15	15

Assumptions - users can edit the highlighted cells to modify the assumptions

	Speed	Conventional	ENERGY STAR
Electricity Consumption (kWh/week)	s ≤ 5	1.0	0.3
	5 < s ≤ 15	1.0	0.7
	15 < s ≤ 20	1.0	0.7
	20 < s ≤ 30	1.0	0.6
	30 < s ≤ 40	1.0	-0.2
	40 < s ≤ 65	-5.1	-1.4
	65 < s ≤ 82	-5.1	-3.4
	82 < s ≤ 90	-28.5	-3.4
	s > 90	-28.5	-29.7
	selected	1.0	0.7

Weeks per year	52.1
Equipment lifetime (years)	6

Annual electricity consumption per fax machine (kWh)

Conventional	ENERGY STAR	Savings
52	37	16

Emissions reduction per fax machine

Annual	24	pounds CO2
Life cycle	145	pounds CO2

References

- Energy:
 - [ENERGY STAR level: ENERGY STAR specification V2.0](#)
 - [Conventional: ENERGY STAR specification V1.1](#)
- Lifetime:
 - Market research by LBNL, 2009

Scanner Calculations for the ENERGY STAR Office Equipment Calculator

Inputs - to edit these values go to the *INPUTS* tab

	Default	User Entry
Wireless capability	-	No

Assumptions - users can edit the highlighted cells to modify the assumptions

		Conventional		ENERGY STAR	
		Sleep Mode	Standby Mode	Sleep Mode	Standby Mode
Power (W)	Base	4.3	1.0	2.5	0.5
	Wireless adder	2.0	-	2.0	-

	Sleep Mode	Standby Mode
Weekly operation (hours)	84	84

Weeks per year	52.1
Equipment lifetime (years)	4

Annual electricity consumption per scanner (kWh)

Conventional	ENERGY STAR	Savings
23	13	10

Emissions reduction per scanner

Annual	16	pounds CO2
Life cycle	62	pounds CO2

References

- Energy: - [ENERGY STAR level: ENERGY STAR specification V2.0](#)
 - [Conventional: ENERGY STAR specification V1.1](#)
- Lifetime: - Market research by LBNL, 2009

General Assumptions for the ENERGY STAR Office Equipment Calculator

Facility Type - to edit this value go to the INPUTS tab

Selected	1	Commercial
Commercial		
Residential		

Utility Rates - to edit these values go to the INPUTS tab

Selected	51	Wisconsin
	Commercial	\$0.1444
Electric rate (\$/kWh)	Commercial	Residential
U.S. average	\$0.1279	\$1.0460
Alabama	\$0.1181	\$1.6720
Alaska	\$0.2019	\$1.0200
Arizona	\$0.1230	\$1.9530
Arkansas	\$0.0987	\$1.3940
California	\$0.1699	\$1.1420
Colorado	\$0.1203	\$0.9730
Connecticut	\$0.2098	\$1.4150
Delaware	\$0.1346	\$1.6200
District of Columbia	\$0.1286	\$1.4580
Florida	\$0.1177	\$2.0580
Georgia	\$0.1157	\$1.8460
Hawaii	\$0.2987	\$4.0130
Idaho	\$0.1002	\$0.9270
Illinois	\$0.1254	\$1.0490
Indiana	\$0.1120	\$1.1240
Iowa	\$0.1201	\$1.1100
Kansas	\$0.1231	\$1.4250
Kentucky	\$0.1008	\$1.5280
Louisiana	\$0.0925	\$1.2620
Maine	\$0.1561	\$1.8290
Maryland	\$0.1384	\$1.4450
Massachusetts	\$0.1982	\$1.3150
Michigan	\$0.1444	\$1.0280
Minnesota	\$0.1236	\$1.0440
Mississippi	\$0.1131	\$1.1980
Missouri	\$0.1106	\$1.6390
Montana	\$0.1102	\$0.9190
Nebraska	\$0.1093	\$1.1180
Nevada	\$0.1280	\$1.3920
New Hampshire	\$0.1857	\$1.7530
New Jersey	\$0.1599	\$0.9710
New Mexico	\$0.1267	\$1.0600
New York	\$0.1869	\$1.3160
North Carolina	\$0.1135	\$1.4850
North Dakota	\$0.0986	\$1.0390
Ohio	\$0.1265	\$1.4410
Oklahoma	\$0.1009	\$1.5980
Oregon	\$0.1069	\$1.3620
Pennsylvania	\$0.1379	\$1.3490
Rhode Island	\$0.1924	\$1.6370
South Carolina	\$0.1245	\$1.7580
South Dakota	\$0.1102	\$1.0190
Tennessee	\$0.1027	\$1.2860
Texas	\$0.1167	\$1.4500
Utah	\$0.1102	\$1.0140
Vermont	\$0.1707	\$1.7010
Virginia	\$0.1139	\$1.4580
Washington	\$0.0897	\$1.1250
West Virginia	\$0.1005	\$1.3200
Wisconsin	\$0.1444	\$1.0280
Wyoming	\$0.1102	\$1.1060

Discount Rate - users can edit this value to modify the assumption

4.0%

Carbon Dioxide Emissions - users can edit the highlighted values to modify the assumptions

Electricity CO ₂ emissions factor	1.54	lbs CO ₂ /kWh			
CO ₂ emissions for average passenger car	10,471	lbs CO ₂ /year	Equivalent for selected equipment:	0.00296	Display value: reduction of not driving your car for 1 day

References

Electric rates:	- National average: 2016 US Electric Rate: EIA, Annual Energy Outlook 2015 edition (converted from 2013 to 2015 dollars.) - State rates: US Department of Energy, Electric Power Monthly, Table 5.6B, January 2016 edition (with data through Nov 2015)
Discount rate:	- Assumed real discount rate of 4%, which is roughly equivalent to the nominal discount rate of 7% (4% real discount rate + 3% inflation rate)
Car emission factor:	- EPA (2013a). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011. Chapter 3 (Energy), Tables 3-12, 3-13, and 3-14. U.S. Environmental Protection Agency, Washington, DC. U.S. EPA

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About the Savings Calculator for ENERGY STAR Qualified Office Equipment

Calculator last updated October 2016 with revised monitor/signage calculator, utility rates and emissions rates.
If you have questions, comments or suggestions, please write to calculators@energystar.gov

Product Type	Version of ENERGY STAR Specification	Specification Effective Date	ENERGY STAR product page
Desktop computer	6.0	June 2, 2014	https://www.energystar.gov/products/office_equipment/computers
Laptop computer	6.0	June 2, 2014	
Computer monitor	7.0	July 1, 2016	https://www.energystar.gov/products/office_equipment/displays
Professional Signage			https://www.energystar.gov/products/electronics/professional_displays
Scanner	2.0	January 1, 2014	https://www.energystar.gov/products/office_equipment/imaging_equipment
Copier			
Fax machine			
Multifunction device			
Printer			
Telephony	3.0	October 1, 2014	https://www.energystar.gov/products/electronics/cordless_phones