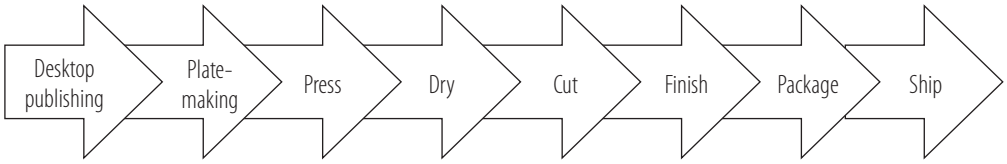
Web-fed Heatset Printers

Sub-sector Description

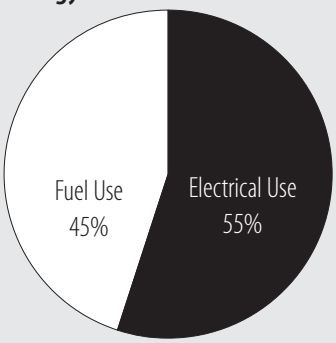
The web-fed heatset printing sub-sector includes all printing methods which require natural gas fired air drying such as web-fed heat set lithography, gravure, flexography, and screen printing. The facilities in the sub-sector are characterized as large, and having long-run print jobs with higher volumes of output and faster production speeds requiring the use of dryers.

Facility Type	SIC	NAICS	Facility Type	SIC	NAICS
Lithographic commercial printing	2752	323110	Book publishing	2732	323117
Gravure commercial printing	2754	323111	Miscellaneous publishing	2759	323119
Envelopes	2677	322233	Manifold business forms	2761	323116
Blankbooks and looseleaf binders	2782	323118			

Process Information



Energy Use[2]



Benchmarks

The following thermal and/or electrical benchmarks were derived from facility-specific energy use, employee numbers, and area data for the facilities that MnTAP analyzed. These benchmarks can be used to predict how efficient your facility is in comparison to peer facilities. If your facility's energy use is less efficient than your peers, there may be energy conservation opportunities available. The benchmarks included have been tested for reliability; however, they should be used with some caution. For more information on the benchmarking study including how to use the benchmarks, view the report Web pages at http://www.mntap.umn.edu/resources/DOC/index.html.

	Most efficient 25%	More efficient 25%	Less efficient 25%	Least efficient 25%
kWh/employee	< 6,635	6,635 - 10,085	10,085 - 15,329	> 15,329
therms/employee	< 454	454 - 982	982 - 2,121	> 2,121

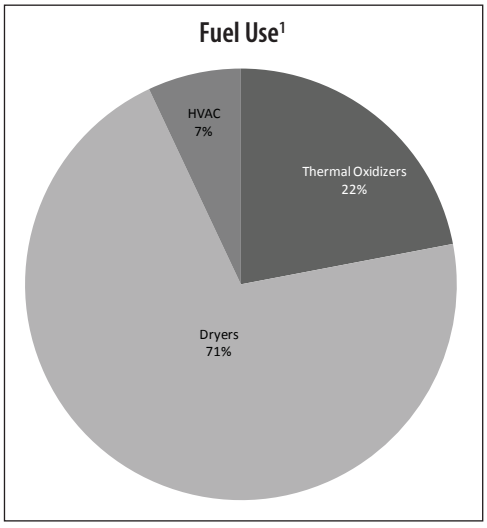
Savings Potential

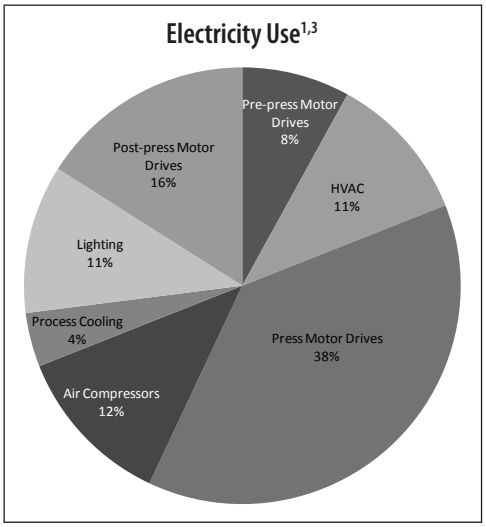
Opportunities and technologies for energy conservation were identified for facilities within this sub-sector. Industry case studies and reports of implementation were used to determine what opportunities may be available and achievable savings from those opportunities. However, additional energy conservation measures may apply to your facility. The tables on Page 2 of this summary reflect a number of energy conservation measures available for this sub-sector.

Estimated Fuel Savings: **14%**

Estimated Electric Savings: **15%**

Energy Use Footprints





Fuel Savings Estimate and Opportunities

Improvement / Opportunity	Estimated Payback	Reported Savings	Overall Savings
Process Heat Optimization			
Replace recuperative type thermal oxidizer with either option A or B			
A: Replace recuperative type thermal oxidizer with regenerative type[4,5,6]	2-5 years	3-8%	
B: Replace older regenerative thermal oxidizer with high efficiency RTO[4,5,6] *and retrofit RTO with catalyst to make it an RCO*[7]	2-5 years	1-6%	
Replace obsolete dryers with more efficient ones[8]	> 4 years	4-22%	
Recover heat from dryer exhaust[9,10]	< 2 years	6-30%	
Integrate dryer and RTO	> 4 years		
Recover heat from dryer or RTO	< 1 year		
Set dryer controls to match ink load	< 1 year		
Facility HVAC Improvements			
Lower space heating temperature during the winter season[11]	< 1 year	0-1%	
Use radiant heater for spot heating[12]	< 2 years	0-2%	
Install thermostats or timers[13]	< 1 year	0-5%	
TOTAL FUEL SAVINGS ESTIMATE			**14%**

Electric Savings Estimate and Opportunities

Improvement / Opportunity	Estimated Payback	Reported Savings	Overall Savings
Process Improvements and Optimization			
Air compressor improvements[14]	1-2 years	1-5%	
Repair leaks, reduce system pressure, decrease supply restrictions, increase storage, eliminate artificial demand and inappropriate uses (cooling, agitating liquids, moving product, drying, etc.), use electrically powered tools or blowers, maintain or replace filters, place air intake in coolest location			
Motors improvements[15]	2-5 years	3-11%	
Install ASDs, install premium efficiency motors, size motors for peak operating efficiency, eliminate voltage unbalance, utilize energy efficient belts, maintain proper shaft alignment, avoid rewinding motors more than twice			
Pump system optimization [16]	2-5 years	0-2%	
Eliminate dampers, throttles, or flow restrictions to reduce flow, turn off when not in use, optimize piping configuration for efficiency, maintain and use most efficient impeller type for application			
Facility Improvements			
Lighting (upgrade, use controls, use occupancy sensors)[17]	< 1 year	2-7%	
TOTAL ELECTRIC SAVINGS ESTIMATE			**15%**

References

1 "Best Practice Guide No. 6: Environmental Considerations". The Web Offset Champion Group. 2007.
2 IAC Industrial Assessments. DOE. http://iac.rutgers.edu/database/assessments.php (191 facilities)
3 "Electricity Use in the Printing Industry". Electronic Power Research Institute Ctr. for Materials Fab. 1994.
4 "Oxidizing Emissions." Industrial Paint & Powder 82 (2006): 35-39.
5 "RTO Innovation." Pollution Engineering 39 (2007): 50-54.
6 "Energy Management at Hess Print Solutions." GATFWorld. April 2008.
7 "Improve Catalytic Oxidizer Operation." Chemical Engineering Progress 103 (2007): 47.
8 IAC Industrial Assessments; DOE, http://iac.rutgers.edu/database/findassessment.php?ID=SD0043
9 IAC Industrial Assessments; DOE, http://iac.rutgers.edu/database/findassessment.php?ID=MA0605
10 IAC Industrial Assessments; DOE, http://iac.rutgers.edu/database/findassessment.php?ID=UD0778
11 IAC Industrial Assessments; DOE, http://iac.rutgers.edu/database/findassessment.php?ID=ST0010
12 IAC Industrial Assessments; DOE, http://iac.rutgers.edu/database/findassessment.php?ID=NV0123
13 IAC Industrial Assessments; DOE, http://iac.rutgers.edu/database/findassessment.php?ID=UL0177
14 http://www1.eere.energy.gov/industry/bestpractices/pdfs/compressed_air_sourcebook.pdf
15 http://www1.eere.energy.gov/industry/bestpractices/motors.html
16 http://www.pumpsystemsmatter.org/content_detail.aspx?id=372
17 http://www.aceee.org/press/op-eds/op-ed5.htm

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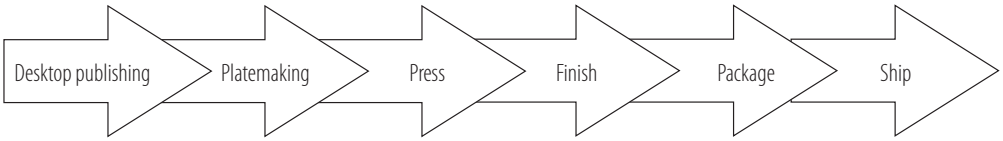
Non-Heatset Printers

Sub-sector Description

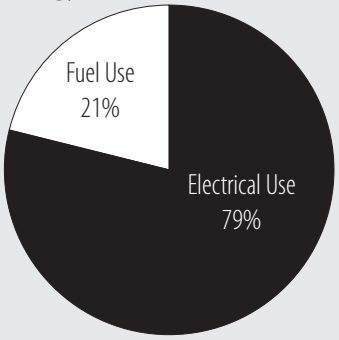
Printing operations across the non-heatset printing sub-sector vary widely among facilities, but in general have some of the same energy-consuming components including press motor drives, air compressors, and lighting. The electrical use footprint for this sub-sector is very similar to the other printing operations, while the gas use footprint is markedly different from heatset printing.

Facility Type	SIC	NAICS		Facility Type	SIC	NAICS
Lithographic commercial printing	2752	323110		Book publishing/printing	2732	323117
Gravure commercial printing	2754	323111		Coated and laminated paper	2672	322222
Envelopes	2677	322232		Manifold business forms	2761	323116
Packaging paper	2671	322221		Stationery	2678	322233
Greeting cards	2752	323110		Commercial printing, other	2759	323119
Newspaper & periodical printing	2752	323110		Book printing	2732	323117

Process Information



Energy Use[1]



Benchmarks

The following thermal and/or electrical benchmarks were derived from facility-specific energy use, employee numbers, and area data for the facilities that MnTAP analyzed. These benchmarks can be used to predict how efficient your facility is in comparison to peer facilities. If your facility's energy use is less efficient than your peers, there may be energy conservation opportunities available. The benchmarks included have been tested for reliability; however, they should be used with some caution. For more information on the benchmarking study including how to use the benchmarks, view the report Web pages at http://www.mntap.umn.edu/resources/DOC/index.html.

	Most efficient 25%	More efficient 25%	Less efficient 25%	Least efficient 25%
kWh/square feet	< 8	8 - 15	15 - 27	> 27
kWh/employee	< 4,566	4,566 - 8,103	8,103 - 14,378	> 14,378
therms/square feet	< 0.27	0.27 - 0.37	0.37 - 0.51	> 0.51

Savings Potential

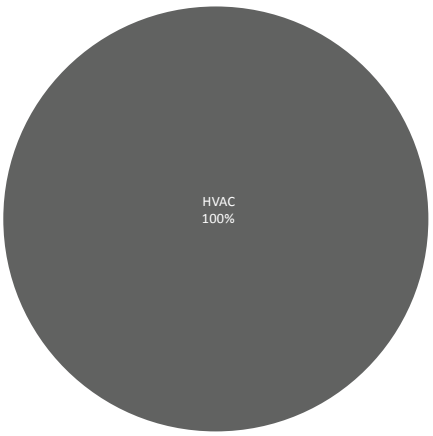
Opportunities and technologies for energy conservation were identified for facilities within this sub-sector. Industry case studies and reports of implementation were used to determine what opportunities may be available and achievable savings from those opportunities. However, additional energy conservation measures may apply to your facility. The tables on Page 2 of this summary reflect a number of energy conservation measures available for this sub-sector.

Estimated Fuel Savings: **11%**

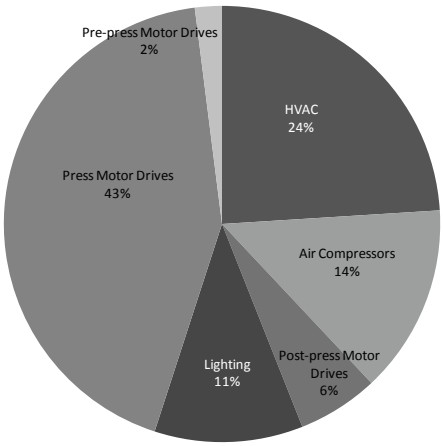
Estimated Electric Savings: **12%**

Energy Use Footprints

Fuel Use[1,2]



Electricity Use[1,2]



Fuel Savings Estimate and Opportunities

Improvement / Opportunity	Estimated Payback	Reported Savings	Overall Savings
Facility HVAC Improvements			
Lower temperature during heating season[4]	< 1 year	0-5%	
Use radiant heat for spot heating[5]	< 1 year	0-20%	
Install programmable thermostats or timers[6]	< 1 year	0-10%	
Humidification System Improvements			
Replace steam humidification system with high-pressure fog humidification system	< 2 years		
TOTAL FUEL SAVINGS ESTIMATE			**15%**

Electricity Savings Estimate and Opportunities

Improvement / Opportunity	Estimated Payback	Reported Savings	Overall Savings
Process Improvements and Optimization			
Air Compressor Improvements (repair leaks, reduce pressure, artificial demand, and inappropriate use, heat recovery, filters, cool intake air, etc.)[7]	1-2 years	2-6%	
Repair leaks, reduce system pressure, decrease supply restrictions, increase storage, eliminate artificial demand and inappropriate uses (cooling, agitating liquids, moving product, drying, etc.), use electrically powered tools or blowers instead of air tools or nozzles, maintain or replace filters, place air intake in coolest location			
Motors improvements (install ASDs, install premium efficiency motors, eliminate voltage unbalance, general maintenance of belts, shaft alignment)[8]	2-5 years	2-10%	
Install ASDs, install premium efficiency motors, size motors for peak operating efficiency, eliminate voltage unbalance, utilize energy efficient belts, maintain proper shaft alignment, avoid rewinding motors more than twice			
Facility Improvements			
Lighting (upgrade, use controls, use occupancy sensors)[9]	< 1 year	2-5%	
TOTAL ELECTRIC SAVINGS ESTIMATE			**15%**

References

1 IAC Industrial Assessments. DOE. http://iac.rutgers.edu/database/assessments.php (194 facilities)
2 "Electricity Use in the Printing Industry" June 2004. Prepared by Energetics Inc, Columbia Maryland.
4 IAC Industrial Assessments; DOE, iac.rutgers.edu/database/findassessment.php?ID=ST0010
5 IAC Industrial Assessments; DOE, http://iac.rutgers.edu/database/findassessment.php?ID=NV0123
6 IAC Industrial Assessments; DOE, http://iac.rutgers.edu/database/findassessment.php?ID=UL0177
7 http://www1.eere.energy.gov/industry/bestpractices/pdfs/compressed_air_sourcebook.pdf
8 http://www1.eere.energy.gov/industry/bestpractices/motors.html
9 http://www.aceee.org/press/op-eds/op-ed5.htm

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