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WHITE PAPER

A New Business Model for Color Printing: A Color Cost per Page That Rivals a Black-and-White Cost per Page Lifts the Final Barrier to Color Adoption and Usage

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IDC OPINION

IDC believes that the use of color in documents can be a very effective communication tool. Compared with black-and-white-only output, color output offers significant benefits that can drive potential business opportunities. However, many potential users either are restricted from using color or are significantly limited from using it as much as they would like. The primary reason for this restriction/limitation comes from the traditionally higher costs associated with putting color on a page versus settling for monochrome output. As long as there is a significant delta between the color cost per page and black-and-white cost per page, the color market opportunity, while attractive, will be hampered by this cost obstacle. Unfortunately, this all-too-common scenario serves to limit companies' ability to capitalize on the numerous benefits available in adding color to general business documents.

Xerox, in an attempt to address the significant differential between color and black page costs, has created a new printer model for its product portfolio. The new Phaser 8860 printer incorporates a unique pricing model so that a larger share of the total costs is applied up front to the acquisition price.

This new printer has substantially lower-cost color consumables — to the point where its color output costs rival black-and-white-only output costs on most standard laser printers. This achieves three primary objectives:

1. Typical workgroup color printer users can gain significant cost savings with a Phaser 8860 versus conventionally priced color laser printers.

2. The new pricing model is designed to drive more color usage by eliminating the fear of high color costs when printing significant color volume.

3. The Phaser 8860 can produce high-impact black business-oriented documents with some color at a cost that is similar to that of black-only pages produced on other devices. As a result, Phaser 8860 users get the benefit of using color without paying more for it.

IDC believes this action lifts the final barrier to greater color usage and could alter the course for substantial color growth at the expense of black-and-white-only printers.

The purpose of this white paper is to:

1. Illustrate IDC's view that the color printer market is demonstrating significant market growth and opportunity

2. Indicate that the color market could show even greater market potential if the cost of producing "black with color" documents were similar to that of producing black-and-white-only documents

3. Provide an action plan that moves a higher proportion of total costs from color consumables to the acquisition price while helping to promote the use of color

4. Highlight how solid ink is a cost-efficient technology that makes substantially reducing color output costs a reality

5. Specify that moderate- to high-volume color users are best positioned to reap the benefits of Xerox's new pricing model

The Office Color Printer Market Overview

According to IDC's U.S. printer market forecasts, the office color printer market has demonstrated double-digit growth over the past several years. Additionally, color page printer unit shipments are projected to show solid growth from 1.03 million in 2006 to 1.19 million by 2011.

The result of this growth is that color printers' share of the total page printer market has escalated during the past several years. Color printers are also expected to continue increasing their market penetration over the foreseeable future. For example, office color printers accounted for only 10% of the 2002 page printer market. This percentage doubled to 20% in 2005, and IDC anticipates that it will reach nearly 30% by 2011.

This color printer market impact is anticipated as a result of a number of market factors, including the following:

- **Greater availability of color page printers for all types of users.** Today's office color printers span a number of operating environments from the desktop to high-speed, networked environments. More choices naturally lead to greater adoption of the technology to meet the color printing needs of all kinds of users.

- **Significantly lower color hardware prices.** IDC's color page printer forecast for desktop color page printers has demonstrated a steady decline over the past several years and will continue to drop during the forecast period (see Figure 1). The average selling price was $2,509 in 2002 and fell to $901 in 2006. It is projected to be $682 by 2011. As a result, IDC believes that color page printers will become increasingly more affordable in the foreseeable future.

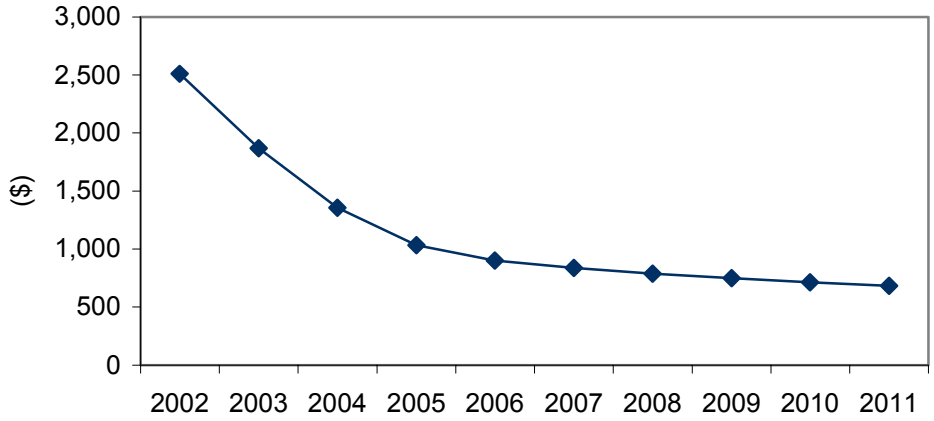
- **Improved performance.** A number of new color printer introductions feature similar print speeds for black *and* color. This is possible because these printers incorporate technology that allows all colors to be put on the page in one pass, rather than multiple passes for each color. The advantage of this technology is that users no longer have to sacrifice speed for color output. With black and color speeds being similar, users do not have to trade color for productivity. Users can produce color at the same performance levels they have experienced in black and white.

- **The value of color is being increasingly recognized.** The addition of color to documents has a positive effect on readers. Some of these positive responses include the following:

  - Color helps attract new customers and builds business opportunities.
  - Color makes documents easier to read and understand, increasing retention of the document's message (e.g., pie charts are more legible in color than in black and white).
  - Color helps enhance company or brand recognition.
  - Readers give greater consideration to color documents or respond faster to color documents (e.g., faster bill payment when the payment due is highlighted in color).

FIGURE 1

U.S. Color Page Printer Average Selling Price, 2002–2011



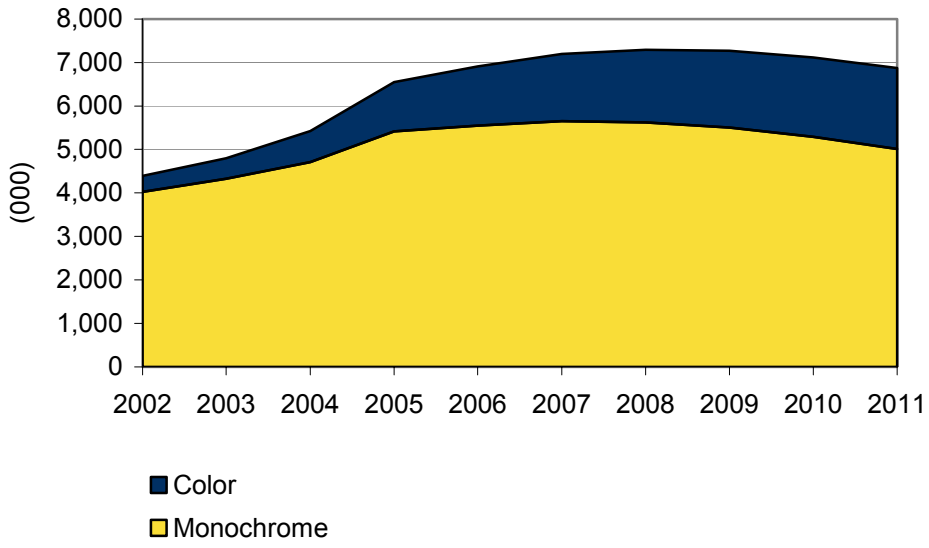
Source: IDC, 2007

What's the Holdup? Why Are More Monochrome Printers Sold Than Color Printers?

With all the additional benefits that color brings to printed documents, it may seem strange that, even in today's market, many more monochrome page printers are sold than color page printers. Specifically, IDC's U.S. forecast of the page printer market shows that while color printers are growing (+3% CAGR through 2011) and monochrome printers are in decline (-4% CAGR through 2011), color printer shipment share still remains in the minority even through 2011 (see Figure 2).

FIGURE 2

U.S. Monochrome and Color Page Printer Unit Shipments, 2002–2011



Source: IDC, 2007

IDC's wealth of current and historical end-user research on the color printer market reveals a very clear reason as to why potential customers do not displace many of their monochrome printers with color printers. The reason is cost.

However, IDC has witnessed that the color cost concern has shifted from hardware cost to the ongoing operation of the device — the cost per color page. As highlighted in Figure 2, manufacturers have been able to drive down hardware costs over the years so that today's color printers are much more affordable than previous generations. While color printers are still somewhat higher in price today than most comparably equipped monochrome printers, the delta between the two printer types is small enough that users can now begin to consider a color printer on the basis of hardware costs alone.

While the hardware cost delta between the two printer types has been largely addressed, another crucial component of the cost discussion still remains unsolved to this point. It revolves around the higher cost per page associated with producing documents in color rather than settling for only black-and-white output.

Unfortunately, a printer's color cost per page is often multiple times higher than its black cost per page. This can happen even with pages that are mostly black with some added color to highlight specific information. One major contributor, and difficult obstacle to overcome, is that color printers require at least four toners/inks to produce color: cyan, magenta, yellow, and black. In addition, color toner is usually priced higher than standard black toner. A monochrome printer requires only one toner/ink (black) to produce its one color. This dynamic adds up to make any level of color output on a page, even a small amount of color, comparatively more expensive versus black-only output per page.

This significantly higher cost has made many organizations rightfully nervous about adopting color in their printing environments. Since a color page can cost significantly more than the same page in black and white, a company's overall print costs could explode if color use became rampant. As a result of these potentially escalating print costs caused by color usage, many companies do not want color to be available on their printers. Black-and-white output is considered to be good enough, or adequate, for their print needs.

In companies where color is made available to users, most organizations have taken steps to limit the amount of color used. These limits might include implementing color printer access restrictions (e.g., only executives can use color) or using job accounting software to restrict page volumes per user or department (e.g., placing color page limits over a specific time period on users/departments). This action limits the incremental costs associated with color but ensures that only a certain amount of color output is generated on a per-user/department basis.

In both cases (not adopting color and severely limiting the use of color), an organization is handcuffed from achieving the full business benefits of color adoption. Unless the rules of the game for color document costs and black-only document costs are changed, color's potential in the business market will remain unfulfilled.

Addressing the Cost Differential Between Color and Black-and-White Output with the Xerox Phaser 8860

Xerox is taking a unique approach to address the black/color cost differential to encourage greater color use. The Phaser 8860 is a heavy-duty version of the company's Phaser 8560. While the models are similar from a hardware standpoint, the Phaser 8860 has a 50% greater duty cycle and new consumables are not interchangeable between the models. However, the most significant difference is in the pricing model for the printer and the related consumables (e.g., solid ink color sticks).

The Phaser 8860 pricing model forgoes traditional pricing practices by placing a greater percentage of the total costs up front on the hardware. In this case, the cost of the Phaser 8860 is three times the cost of the standard model ($2,499 versus $799). However, the prices of the color sticks have been reduced, while the yields have been increased. The new prices and yields are as follows:

- The Phaser 8860 black ink stick is $216 with a yield of 14,000 pages. The Phaser 8560 black ink stick is $93 with a yield of 6,800 pages.
- The Phaser 8860 cyan, magenta, and yellow color sticks are $72 each with yields of 14,000 pages each. The Phaser 8560 color ink sticks are $93 each with yields of 3,400 pages each.

Using IDC's cost-of-ownership model for color printers, we found that the Phaser 8860 achieves the following black and color costs per page (see Table 1).

- The black cost per page remains comparable at approximately $0.016 per page (assuming 5% coverage).
- The new color cost per page falls dramatically from nearly $0.10 to just over $0.03 per page (assuming 5% coverage per color).

Most conventionally priced monochrome and color laser printers have a black cost per page within a range of $0.01–0.02 per page. However, most color laser printers' color cost per page is typically $0.10+ per page as a result of their higher supplies costs.

Table 1 also shows IDC's assumptions on the typical use of color workgroup printers. Our research has shown that an average workgroup color printer produces approximately 2,000 pages per month, with the majority of this output in color. IDC estimates a 70/30 split in the color/monochrome page volume for color printers. Finally, the average color printer is in use for approximately three years.

TABLE 1

Cost of Ownership Calculations for the Phaser 8860

Consumable	Price ($)	Yield (Pages)	Monochrome $/Page	Color $/Page
Black	216	14,000	0.01543	0.01543
Cyan	72	14,000		0.00514
Magenta	72	14,000		0.00514
Yellow	72	14,000		0.00514
Price	2,499	2,592,000	0.00096	0.00096
Maintenance	100	864,000	0.00012	0.00012
Total $/page			0.01651	0.03194

Note: Assumes a 2,000-page average monthly page volume (AMPV), a 70%/30% split in color/black page volume, and 36-month printer usage

Source: IDC and Xerox, 2007

The Phaser 8860 pricing model demonstrates that the initial high up-front costs (see Table 2) are quickly mitigated with a breakeven time that occurs well within its product life. This is because the Phaser 8860's supplies costs are typically three to four times lower than those of most other color printers, assuming that the printer is used within IDC's estimates for a workgroup color printer. Under these assumptions, the Phaser 8860 should provide a breakeven point in slightly more than one year's usage or within 25,000 pages of output versus other conventionally priced color printers. This makes the Phaser 8860 an attractive option under typical use conditions.

Even more importantly, the Phaser 8860 can produce a number of high-impact black business-oriented documents with some color at a cost that rivals the cost of producing the same document in just black.

TABLE 2

Phaser 8860 Costs ($)

Hardware	2,499.00
Supplies	1,966.21
Total	4,465.21
Total monthly	124.03
Supplies monthly	54.62
Total per page	0.062
Supplies per page	0.027

Source: IDC and Xerox, 2007

Xerox's Exclusive Solid Ink Technology

An obvious question to ask is, How can Xerox realize lower color cost levels when other color printer vendors have not been able to do so? The secret lies in the printing technology used by the Phaser 8860, which incorporates Xerox's unique solid ink technology. While its output is often compared with that of laser devices, solid ink offers a number of distinctive features and benefits that set it apart from conventional color printers.

A key cost benefit is achieved through solid ink's cartridge-free consumable versus traditional toner cartridge consumables employed by competitive color laser printers. The Phaser 8860 uses four colored ink sticks. The ink sticks are easy to load because each ink stick color incorporates a unique shape that prevents users from inserting an ink stick in the wrong place in the printer (e.g., putting the cyan ink stick where the yellow ink stick belongs).

From a cost comparison standpoint, a cartridge-free solid ink consumable can be more efficient than a cartridge-based laser toner. When toner is used up in a cartridge, users are left with an empty cartridge of plastics as well as other unused materials. These materials, used to house the toner, obviously come with a cost, but they serve no direct purpose in producing a printed page. They are either wasted or recycled. On the other hand, once a solid ink stick is used up, it leaves behind virtually no unused parts or materials. Other efficiencies gained from the use of solid ink sticks versus cartridge-based toner include smaller size and lighter weight, which make solid ink sticks easier to transport and store.

Additionally, laser-based color printing systems have a high cost burden associated with the drums used (one for each color) to produce text and images on paper. These drums have high fixed costs, making it very difficult to price a color page like a monochrome page. The Phaser 8860 printer does not carry these high fixed costs, so solid ink can offer a lower color cost per page option versus laser-based printers.

Thus, the inherent efficiency and lower-cost solid ink consumable system make it possible to create a new business model of color printing and make color output less expensive. Xerox maintains exclusive rights to solid ink technology. As a result, it is the only printer company that can offer color users the benefits of the solid ink printing technology and its related consumables.

Challenges to Address

At the surface level, it may sound like Xerox has come up with the definitive solution to address the cost concerns of color for all users. However, IDC believes the Phaser 8860 can address the color concerns for most, but certainly not all, color users.

This new printer places a higher proportion of the overall costs at the time of the acquisition. Additionally, the cost of black output does not change dramatically. Thus, to truly derive the benefits outlined in this white paper, the Phaser 8860 user should generate a minimum number of pages on a regular monthly basis. The Phaser 8860 would *not* make fiscal sense in the following circumstances:

- **Low-volume color users.** Assuming the average output mix of a workgroup color printer (70/30 in favor of color), IDC estimates that the breakeven average monthly print volume for the Phaser 8860 is between 600 and 900 pages per month versus most other color printers. If a workgroup in your company is considering the purchase of a shared color printer *and* does not generate this page volume, your company can probably opt for a lower-priced printer, pay more for each color document produced, and still come out ahead. While the breakeven point is not particularly high in IDC's estimation, low-volume color environments pay less over the life of the printer with this more conventional color printer option and pricing model than with a Phaser 8860.

  The Phaser 8860 is targeted at business use. Most consumers or home users do not usually generate the types of volume associated with the breakeven point calculated with this printer. Most consumer/home environments, such as low-volume color users in the enterprise, would also pay less overall with a lower-cost printer and higher color cost per page than with a Phaser 8860.

- **A workgroup of monochrome-only users.** This may seem obvious, but color printers, no matter how the hardware or supplies are priced, will not make sense for users who produce only black-and-white documents. The hardware investment on a monochrome-only printer will be less expensive than that of a color-capable device. Additionally, the black cost per page is often higher on color-capable devices than on monochrome-only devices.

Conclusion

Substantially reducing the color cost per page removes the final barrier to more widespread use of color printers. This new business model, adopted by Xerox's Phaser 8860, shows promise in bringing color users the high-value benefits of color (e.g., more effective communication, enhanced company/brand recognition, higher customer retention and/or response to information) while eliminating any incremental costs associated with producing these high-impact black business-oriented documents with added color. The company is also providing a multifunction version of this printer — the Phaser 8860MFP — that adopts this same marketing and pricing strategy. If this pricing model becomes the industry standard, IDC believes that the overall printer and MFP markets could quickly convert to a predominantly color platform.