

# Implementing Web and Print PDF Standards at NREL

Migration Towards 100% Electronic Processes

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# About NREL

- The National Renewable Energy Laboratory (NREL) is the U.S. Department of Energy's (DOE) premier laboratory for renewable energy research and development and a leading laboratory for energy efficiency research.
- NREL develops renewable energy and energy efficiency technologies and practices, advances related science and engineering, and transfers knowledge and innovations to address the nation's energy and environmental goals.
- 1,000+ Employees
- Locations in Golden, Colorado and Washington DC



# Topics

- IS/Publications Services and Legacy Workflow
- Objectives
- Solutions implemented to-date
- Standards Milestones
- Implementation Phases
- Current Web PDF Standards
- Current Print PDF Standards
- Statistics
- Future Enhancements
- Recommendations

# Publications Services Overview

- NREL's Scientific and Technical Information (STI) is disseminated to the public via printed publications (pubs) and PDFs available from numerous databases and energy-related Websites
- STI Publications are categorized as
  - **Technical** (PC/Mac word processing), average user
  - **Outreach** (Mac page layout, graphics), more technical user
- Over the past 7 years, IS/Publications Services have been migrating towards 100% electronic processes
- Trends increasing towards inexpensive “quick-print” (Kinkos) and “electronic-only” publications
- Less paper, reduced costs, faster publishing!

*e.N.E.R.G.Y.*  
National Renewable Energy Laboratory  
**ePubs Update**

# Legacy System (1998)

- Technical pubs printed from hard copy or film
- Outreach pubs printed by Government Printing Office (GPO) vendors from native files
- Numerous “required” copies printed (ranging from 100 - 3,000 quantity)
- Very small percentage of pubs available on Websites
- Printed copies submitted to the Office of Scientific and Technical Information (OSTI) for scanning and posting as single-page tiffs

# Fallbacks of Legacy System

- High printing and distribution costs and slow turnaround
- Revisions made on hard copy/film or by vendor
- Electronic files on degradable media and not “final”
- Full-text pubs not available in NREL’s Publications database
- Though OSTI scanned NREL pubs:
  - View and print page by page only (tiffs)
  - Average post time varied 6 weeks to a year
- Printed copies requested by end users were very expensive
- If available, posted PDFs were low-quality, inconsistent and usually not the “final” version

# Objectives

- Reduce printing costs
- Faster public access to NREL pubs
- Ensure quality of PDFs posted
- Streamline workflows
- Reduce data entry
- Central electronic (native) file archives
- Decrease support costs

Implement 100% electronic processes for submittal, review, approval, and dissemination of NREL-produced publications!

# Solutions

- Reduce number of “required” printed copies
- Move revisions from vendor back to graphic artist
- Make all NREL pubs available in PDF format
- Public PDF server that databases can link to
- OSTI “harvesting” of database records
- Standards for “Web” PDFs
- Implement subset of existing Mac OS/Application standards for graphic artists
- Standards for “print” PDFs
- Near-line electronic file archive via Stortek Timberwolf server and automated tape device
- Provide both end-user and graphic artist “custom” training according to defined standards

# Why Standards?

- PDFs can contain and do so many things...
- In a workflow situation, this is not always good
  - Bells and whistles beyond intended purpose create bottlenecks in the workflow
  - PDF Standards are “subsets” with criteria of what is allowed and required for a PDF to meet a certain purpose
- Standards and Best Practices speed up workflows
- More efficient workflows translates to faster turnarounds and reduced costs

# Standards Milestones

- 2000 ▶ PC/Mac Desktop standards
- 2001 ▶ First Web PDF standards
- 2002 ▶ Custom PDF end-user training PCs  
▶ Added Section 508 requirement
- 2003 ▶ Subgroup of Mac Desktop standards  
for graphic artists (Adobe)  
▶ Custom PDF/Preflight graphic artist  
training Macs
- 2004 ▶ PDF/X-1a standards for print PDFs

# Phase I

**“Technology is great, PDFs are Easy!”**

- Chose PDF format for electronic posting of all NREL/DOE pubs (1999: Acrobat 3)
- Required submittal of PDF or native files in addition to hard copy
  - Technical pubs still printed from hard copy
- Requested return of native files modified by print vendors for Outreach pubs
- OSTI e-link established, PDFs directly uploaded into their system

# Phase I Issues

- Electronic files submitted on degradable media and stored in job files
- Files not re-purposable if electronic file revisions made by vendor at print were not returned, or if revisions were done on film
- Supplied PDFs were predominantly unusable
  - PC authors used PDFWriter
  - Mac-based Outreach docs usually better but often fonts not embedded
- Supplied PDFs were created before printing, not final due to changes at proof
- Errors or file corruption sometimes occurred when PDFs were uploaded to OSTI

# Phase II

## “PDFs not Consistent, We need Control!”

- Acrobat 4 rollout to lab (2000)
- Required all native files (PDF optional) and hard copy for Technical and Outreach pubs
- Implemented electronic submittal process of native files for Mac/PC platforms, respectively
- Centralized PDF creation after final print
- Created PDFs from originating platform (Mac/PC)
- Set up public PDF server and linked to PDFs from databases

# Phase II Issues

- Centralized PDF creation required extensive Mac/PC hardware, software, and graphics expertise
- Single staff member duplicated revisions made by vendors to native files and created all Web PDFs
- Single staff member often backlogged troubleshooting numerous issues
- Technical publications still reproduced from supplied hard copy
  - Time consuming to reformat native docs to matched printed copies (reflow based on print driver used to print hard copy)

# Phase III

## “We Need Standards”

- Acrobat 5 rollout to lab (2002)
- First standards for PDF creation developed and implemented lab-wide
  - Thank you, Dov Isaacs and PDF Conference!
- Web team acquired “final” PDFs from Publications instead of directly from authors/graphic artists
- Began creating hi-resolution Print PDFs
- Submitted link to OSTI and eliminated upload of PDFs
- Increase in CD products for interactive PDF collections and supplemental electronic files

# Phase III Issues

- Even with posted PDF standards, much QA and optimization to Web standards required – not enough end-user training
- Print PDFs created by graphic artists produced inconsistent results, colors, transparency issues
- Multiple proofing/reproofing increased costs and missed deadlines
- Numerous font type issues abounded
- Could not control “GIGO” factor of multitudes of submitted files
- Too many graphics applications and operating system variables increased support costs and slowed production

# Phase IV

**“It’s a Digital World, Let’s Make it Work for Us!”**

- Addition of Section 508 requirements to Web PDF standards
- Reduced number of required printed distribution copies to under 10 in most cases
- Implemented electronic distribution
- Implemented system of scan/OCR of legacy publications
- Implemented NREL’s Electronic Outreach Network (NEON)
- First laboratory to implement OSTI database harvesting due to consistency of records and metadata in PDFs, and live links in database.



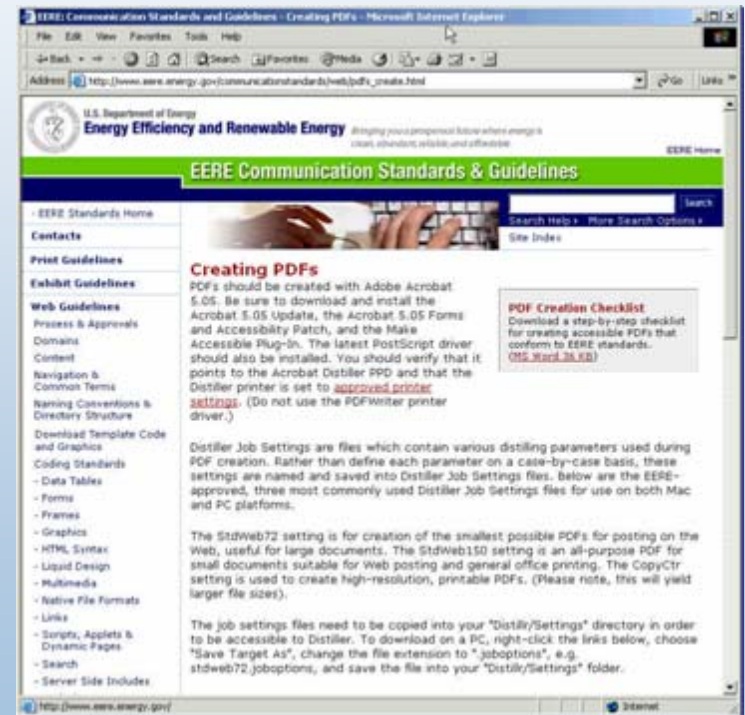
# Phase V

## “Empower Users with Knowledge!”

- Acrobat 6 rollout to lab (2004)
- Implemented Mac OS/Application standards
  - Adobe apps, phased-out QuarkXpress, Freehand, Corel, etc.
  - Standardized fonts, updated logos
- Implemented PDF/x-1a standard for all print jobs (offset and composite)
- Provided extensive graphic artist training and documentation:
  - Preflight and PDF/X-1a standards
  - Design Best Practices for multi-purpose output
- Provided standards-based PDF training and documentation for PC users
- Implemented electronic proof approval process

# Current Web PDF Standards

- PDF 1.5 (Acrobat 6) compatibility
- Use supplied distiller settings files
- All fonts embedded
- Set Open (Initial) View depending on page count
- Set Page Action for pubs with full-page cover
- Create tagged PDFs
- Enter required metadata in document properties
- No Security



<http://www.eere.energy.gov/communicationstandards/web/pdfs.html>

# Current Print PDF Requirements

- Setup document to trim size, not bleed or spread size
- Package all native files, fonts and links
- Submit preflight report, color mockup, proof of separation
- Use supplied InDesign printer styles
  - 1/8” bleeds and output page size
  - Crop and registration marks
- Conform to PDF/X-1a:2001
  - Via distillation of Postscript
  - U.S. Web Coated (SWOP) v2
- All imposition done by publications staff or vendor

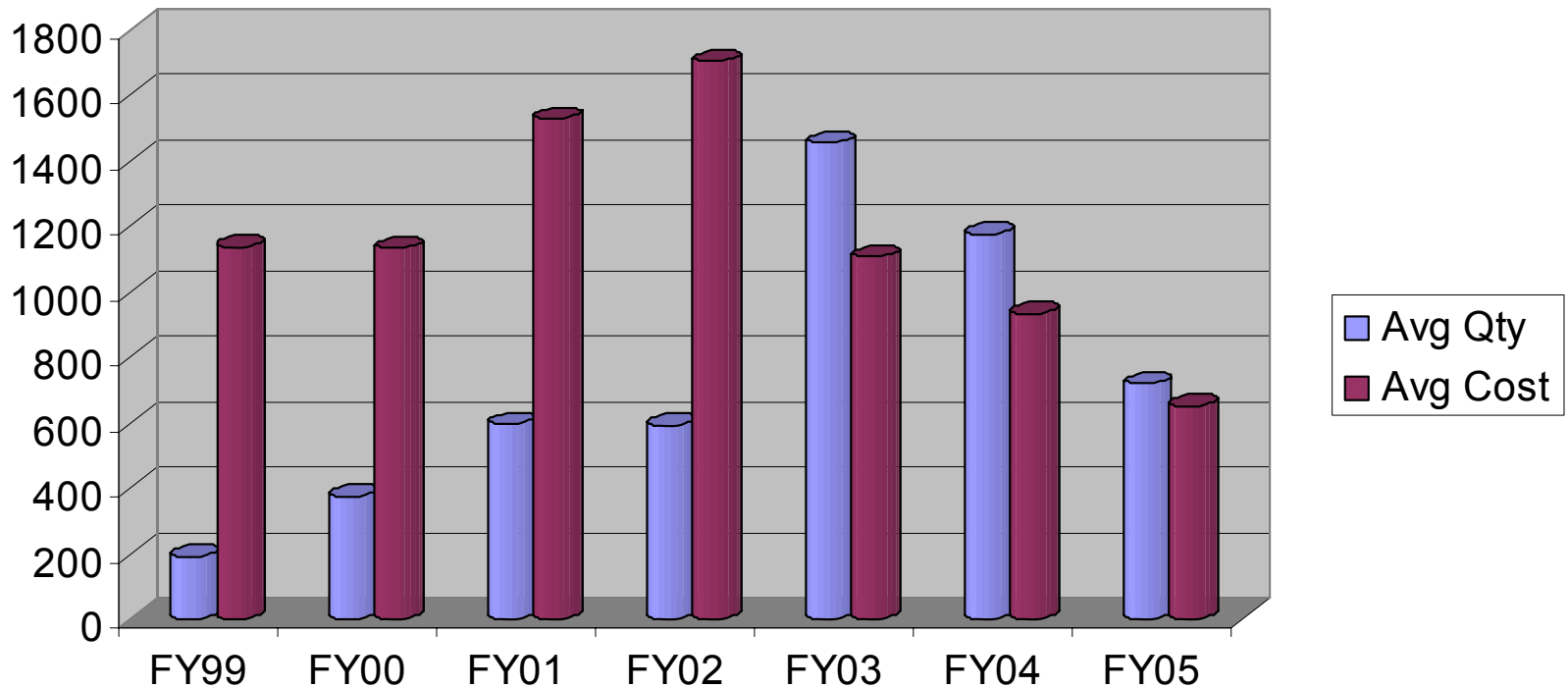


# Primary Acrobat Tools Used by Publications Services

- Adobe Acrobat 6 and 7 Professional
- Apago/PDF Sages PDF Enhancer
- ARTS PDF Aerialist
- ARTS PDF Publishing Suite
- ARTS PDF Variform Plus
- Enfocuss Pitstop Professional
- Callas pdfLayerMaker
- DancerPro (The Circle Mountain Company)
- Infodata Compose Desktop
- PDF Snake (Rennie Glen Software)
- Windjack AcroButtons

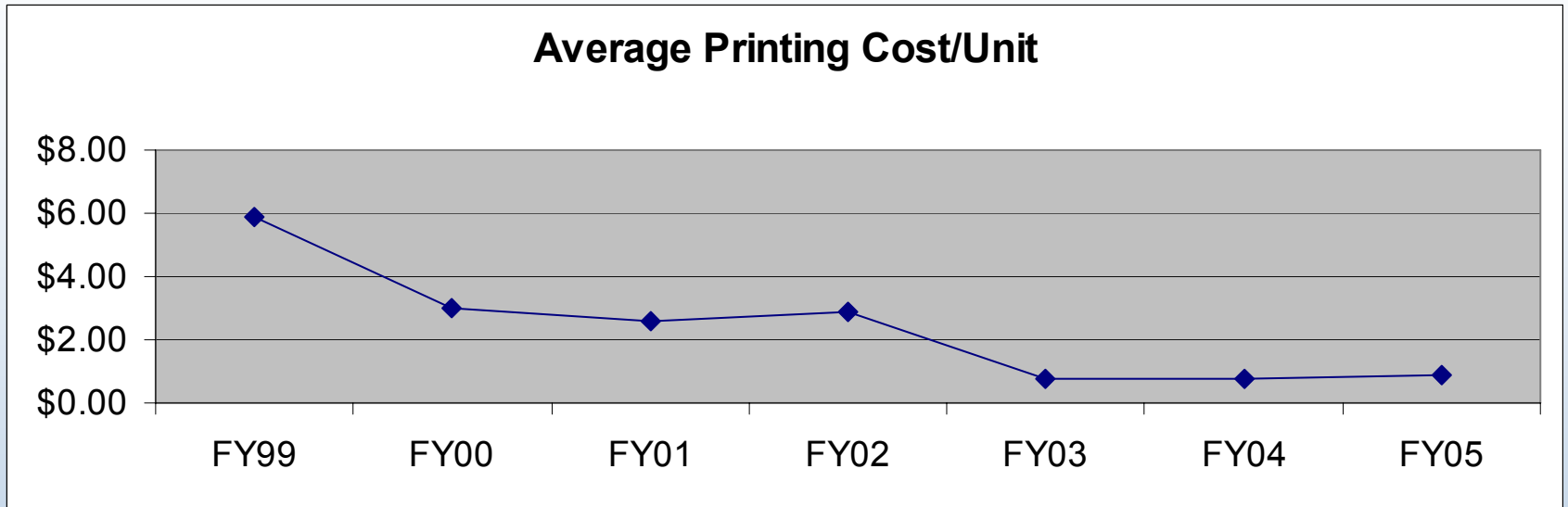
# Publications Statistics

## Average Print Quantity/Cost Comparison



We're printing less and printing cheaper...

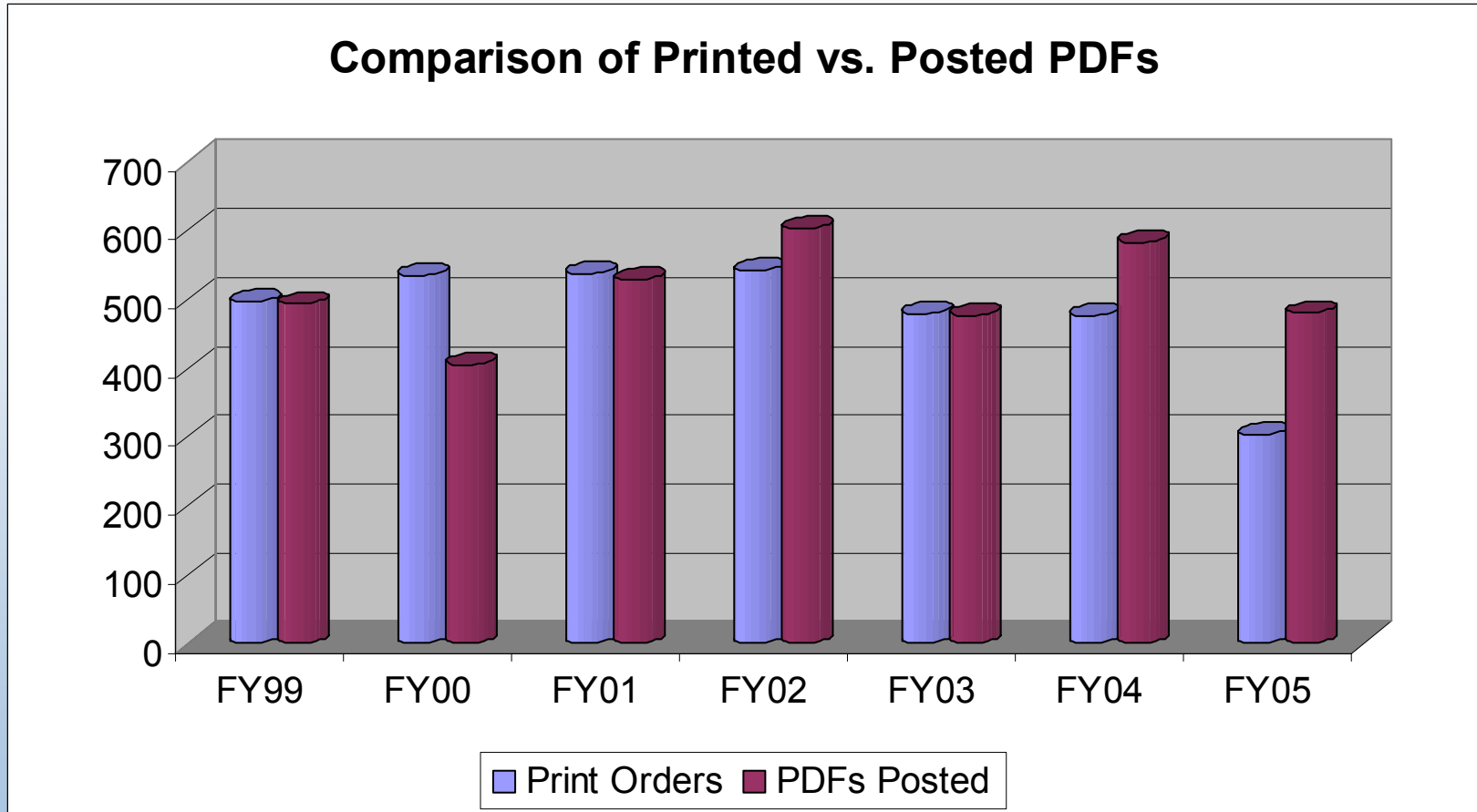
# Publications Statistics



Factors attributing to reduction in printing costs per unit:

- Decrease in offset print towards digital quick-print
- Shift of print revisions/corrections from vendor to artist
- Preflight education for graphic artists
- Standardization on PDF/X

# Publications Statistics



Comparison of number of printed pubs indicate trend towards electronic-only publishing

# Publications Statistics

- Most accessed file type on NREL websites is PDF (95.49%)
- Page views on NREL Pubs database pages up 589.3% from 2001
- Document Distribution Services (DDS) printed copies sent to requestors reduced 79.8% from 2001
- Number of NEON subscribers since inception in 2002 has grown to 1,118
- OSTI harvesting of records implemented in 2001 decreased annual data entry by over 300 manhours
- Average post time for OSTI is within a week, compared to 6 weeks to a year post time with legacy system



# Future Enhancements

- Planned for 4<sup>th</sup> quarter 2005:
  - Implement lab-wide rollout of Acrobat 7
  - Update Mac standards to OS 10.4.2 (Tiger), Adobe CS2, Acrobat 7 Professional.
  - Conduct updated PC (technical, word processing) and Mac (outreach, preflight, PDF/X-1a) training using Acrobat 7.
  - Update legacy Publications database to Web-based system instead of desktop client interface
- Conduct lab-wide Acrobat 7 training on Commenting / Markup for implementation of electronic proof review process
- Migrate central electronic file archives from Stortek Timberwolf tape storage device to live server with 72TB Raid 5 Array

# On-Going Challenges

- Duality of PDFs existing on Publications' public PDF server and Websites
  - Stats software requires PDF nested in Web folders instead of on separate server
- Continued end-user training to improve quality of native files for Section 508 compliance
- Continued updating of standards with new technology, requiring collaboration with:
  - Communications and Web team
  - IS infrastructure team
  - DOE
  - Print Vendors

# Recommendations

## Based on our Experience

- Understand and build your workflow around target audience, production, and archive requirements
- Standards implementation and quality assurance procedures save time and money long-term!
- If possible, create PDFs from originating platforms
- Consistently enter metadata into PDF document properties to improve searchability of Web PDFs
- Hardware/OS/software standards implementation reduces support costs
- Identify and implement testing processes for “new” software version and OS rollouts
- 3<sup>rd</sup>-party tools assist in print production workflows

# Recommendations

## Based on our Experience

- Investment in end-user training critical
- Customized standards-based training is more effective than “generic” application training
- Shorter, single-topic sessions over time (e.g. “brown-bag sessions” or webinars)
  - Seem to be retained better than “boot camps”
  - Easier attendance with shorter time commitment
- Supply resources such as
  - Document templates, InDesign printer styles, standard fonts
  - Standardized Distiller settings files
  - Best Practices Guidelines (Design for multiple output)
  - Workflow, PDF Creation, and PDF QA Checklists
- Attend PDF conferences – invaluable resources and knowledge sharing available!

# Thank You

- [www.nrel.gov](http://www.nrel.gov)
- [www.osti.gov](http://www.osti.gov)
- [www.eere.energy.gov/communicationstandards/web/pdfs.html](http://www.eere.energy.gov/communicationstandards/web/pdfs.html)



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