



# PEARL Update

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# PEARL Background

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- ◆ Program for the Evaluation and Analysis of Residential Lighting.
- ◆ Independent “off-the-shelf” testing program for Energy Star labeled screw-based CFLs and fixtures.
- ◆ Created due to product quality concerns and lack of Energy Star or industry verification testing.

# PEARL Basics

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- ◆ Run by PEARL Board
  - Consists of representatives from utilities, program administrators, regional MT groups, advocates, and national labs.
- ◆ Currently PEARL is a self-standing program hosted by the Lighting Research Center (LRC) in Troy, NY. LRC is a NVLAP facility.

# Roles

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## PEARL Board

- ◆ Develops list of products to test
- ◆ Purchase samples
- ◆ Reviews data/approves report
- ◆ Distributes results

## LRC

- ◆ Receives and logs samples
- ◆ Performs testing
- ◆ Creates reports
- ◆ Invoices and accounting

# Roles II

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- ◆ PEARL provides full data set and summary report to Energy Star (DOE and EPA).
- ◆ Any follow-up inquiries, delisting, etc. is done by Energy Star and NOT by PEARL.

# Testing

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## ◆ CFLs

- Moving from 5 to 10 samples/model for testing (plus six additional ones for rapid cycle test).
- Buy samples from 3 parts of the country.

## ◆ Fixtures

- Only test 1 sample/model.
- Buy 2, one for back-up.

# Status

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- ◆ Historically tested 20 CFL models and 10 fixtures per cycle. Roughly 2 cycles/yr.
- ◆ Finalizing Cycle 5. About to begin Cycle 6.
- ◆ To date, all funding has been from utilities, MT groups, etc. and recently from Energy Star.
- ◆ New ES CFL specification adds “Pay to Play” requirement for Energy Star partner.

# Future CFL Funding

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- ◆ Current sponsors unwilling to continue to fund PEARL other than nominally.
- ◆ Need to work out specifics on overall budget and how to allocate costs.
- ◆ Near-term plan use LRC to do Cycle 6 and 7.
- ◆ Cycle 8 to occur in mid 2005 and will be funded by manufacturers.



# CFL Trends/Results

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- ◆ Ongoing high levels of non-compliance with Energy Star specification found for three key parameters:
  - Rapid cycle
  - 1,000 hr lumen depreciation (70%)
  - 40% of rated life lumen depreciation (80%)
- ◆ Problems not limited to just a few companies. Culprits include both “large” and “small” companies.

# CFL Trends/Results II

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- ◆ Greatest non-compliance found with covered products (reflectors, globes, A-lamps), especially reflectors.
- ◆ Relatively wide performance spread found for specific models (QA/QC issues at the factory?).

# Cycle 4 Findings

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## ◆ Lumen Depreciation

- 40% of the tested models did not meet the 90% lumen requirement at 1,000 hrs.
- Of the 90 CFL samples tested:
  - 20 burned out prior to 40% of life.
  - 28/70 that survived did not meet the 80% LM requirement.
- Reflector LM found to be 65%-75%. This will be noticeable.

# Cycle 4 Findings II

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- ◆ Rapid Cycle – 1/3 of the tested models failed (2 or more of the 6 died during the test).
- ◆ The Shocker – Only 5 out of 20 models met all the requirements for efficacy, 1,000 hr and 40% of life LM, and rapid cycle.

# Preliminary Cycle 5 Results

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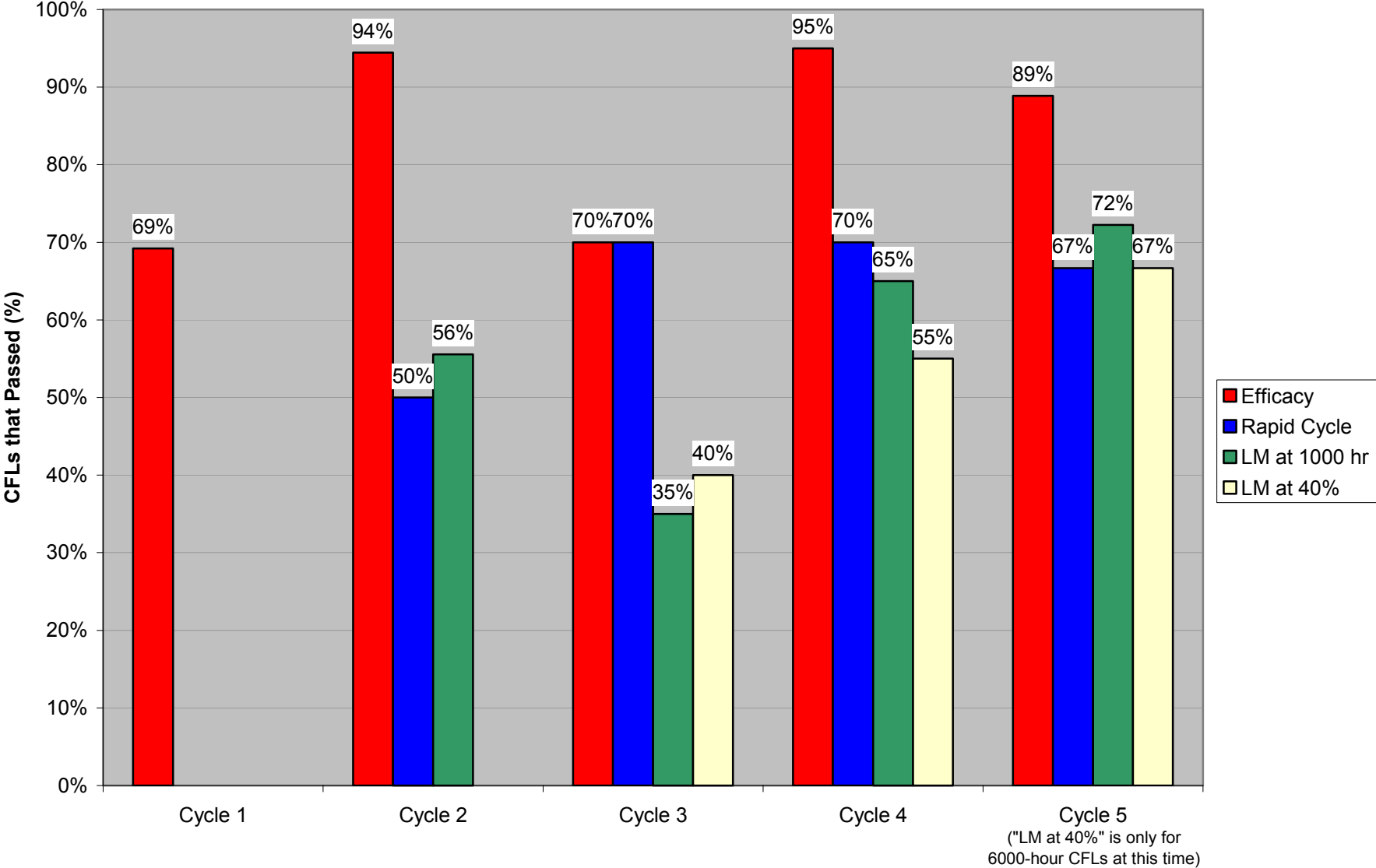
	<u>Failure Rate</u>
Efficacy	2/18
Rapid Cycle	6/18
LM – 1,000 hr	6/18
LM – 40% life	TBD
OVERALL	8/18

# Significance

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- ◆ Compliance varies greatly by lamp category
  - 8/10 (80%) of bare bulbs met all three requirements.
  - 2/8 (25%) of covered products met all three requirements.
- ◆ Reflectors and globes, with few exceptions, are not meeting the requirements.

# Overall CFL Performance



# PEARL's Of Wisdom

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- ◆ Why the disconnect between initial qualification data (met ES reqts) and extensive non-compliance from off-the-shelf testing?
- ◆ Reflectors – in field experience likely to be even worse due to heat build-up in cans.

PEARL to conduct in-situ testing of reflectors as part of Cycle 6.



# PEARL's of Wisdom II

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- ◆ Concerns:
  - Changes being made to products after initial qualification (different components, suppliers).
  - Products being made at different factory than before. Multiple factories used for same product.
  - Insufficient process control and attention to QA/QC.

# Where to From Here?

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- ◆ Begin planning for Cycle 7
  - Agree on how to fund it
  - Create technical committee to discuss key issues (test methods, sample size, data reporting, etc.). Industry and retailers welcome.
- ◆ DOE to propose various administrative models to continue the off the shelf testing. If PEARL, we plan to:
  - a) Expand data distribution.
  - b) Competitively bid out key functions (testing, data analysis, etc.)

# Regardless of Administrative Model

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- ◆ Keep the testing going, no hiatus.
- ◆ Use a “targeted” approach for developing the list of products to test. Don’t just make it random.
- ◆ Energy Star create well-defined criteria for delisting and adhere to it.

# Regardless of Administrative Model II

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- ◆ Consider action on reflector lamps – remove until further notice; add in-situ test to the next version of the spec, etc.
- ◆ Current PEARL sponsors need continued access to testing results to help justify ongoing promotion and incentive programs.

# Our Per Cycle Estimate

(based on current administrator and lab, scope, and services)

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	5 samples/ model	10 samples/ model
20 models	\$120 K	\$200 K
<b><u>30 models</u></b>	\$157 K	<b><u>\$277 K</u></b>
40 models	\$198 K	\$352 K

Note – costs include sample purchase and shipping, sample logging, testing and verification, data analysis and reporting, sample storage (1 yr), and travel to PEARL meetings.

# Budget/Cost Considerations

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- ◆ Need to resolve:
  - Size of the pie (defined by number of bulbs tested, lab used, etc.)
  - How to allocate the costs?

75% manufacturers	10% ES – DOE
10% retailers	5% public interest
  - How to slice the manufacturer piece? Per company? Per SKU?

Beware: List will likely shrink dramatically once deadline for payments is received.