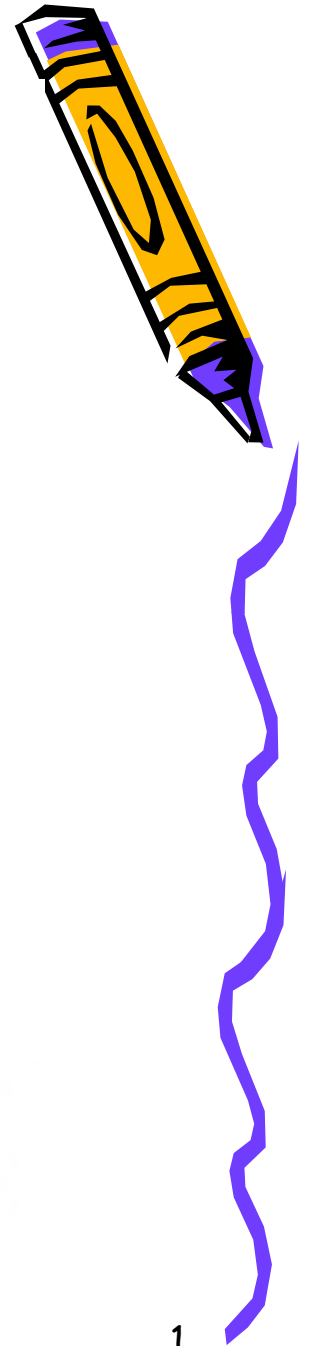
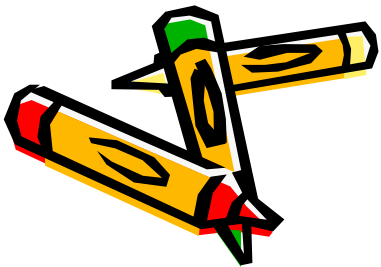


Green school /grEn
skül / n.: a school
building or facility that
creates a healthy
environment that is
conducive to learning
while saving energy,
resources and money



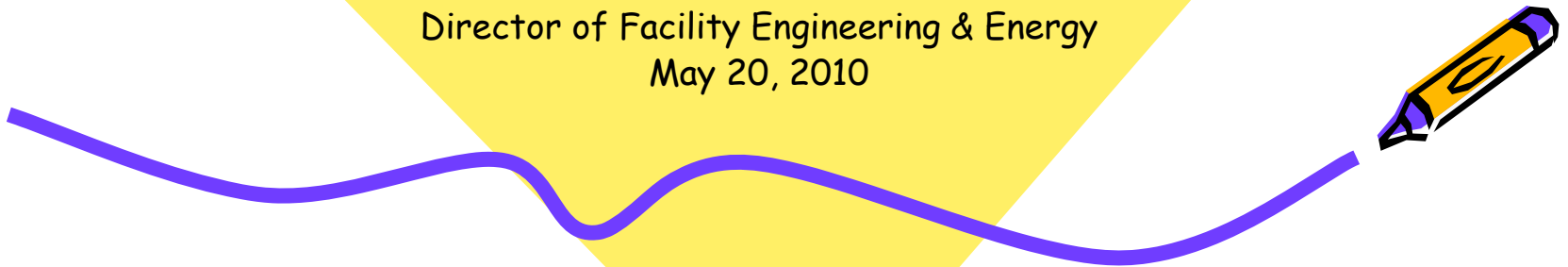


Greening Duval Schools

Susan Carew, EI, LEED AP

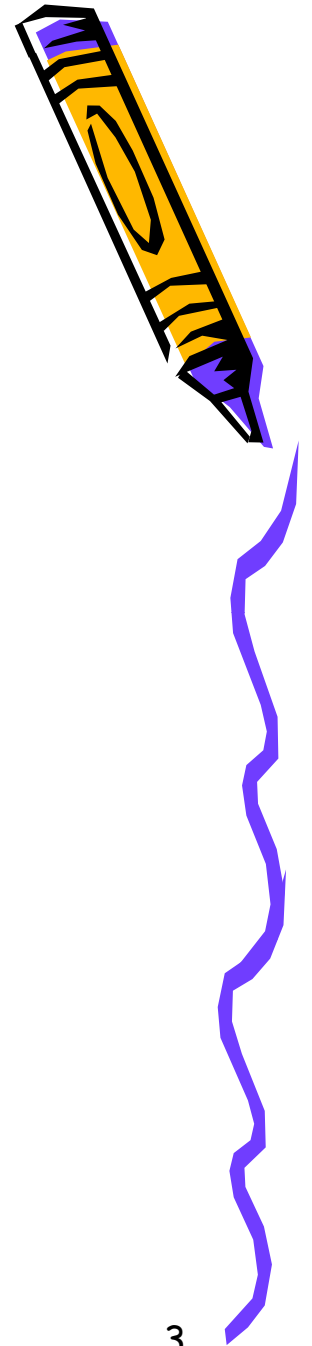
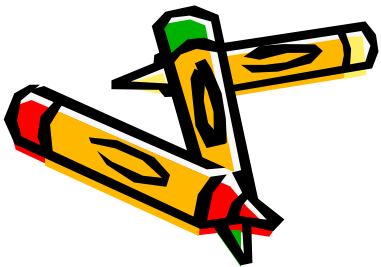
Director of Facility Engineering & Energy

May 20, 2010

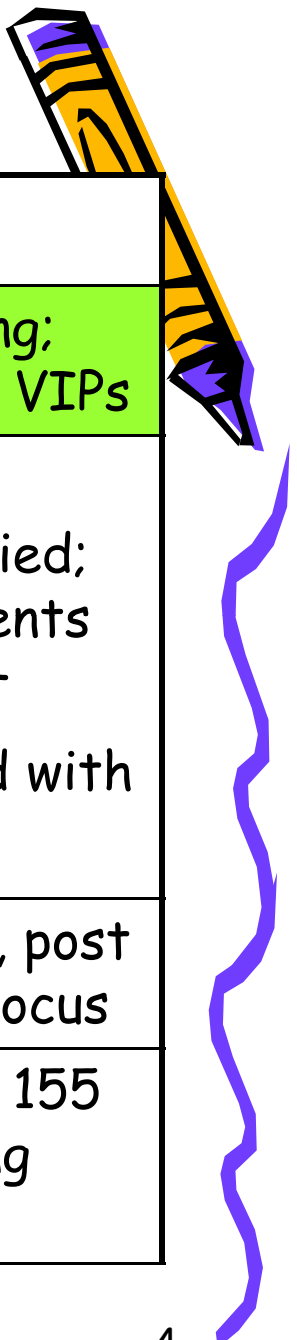


Greening DCPS

- Utility Benchmarking
- Conservation Improvements
- Commissioning and Energy Results
- Awareness/Education - **Green Champions!**



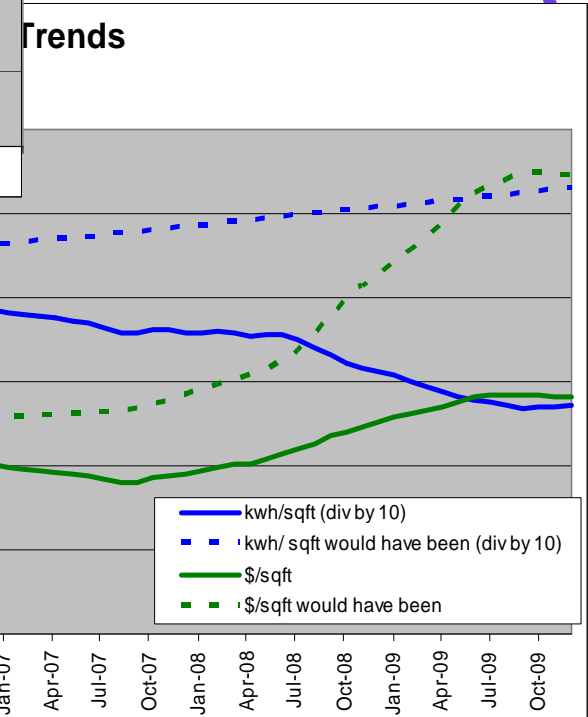
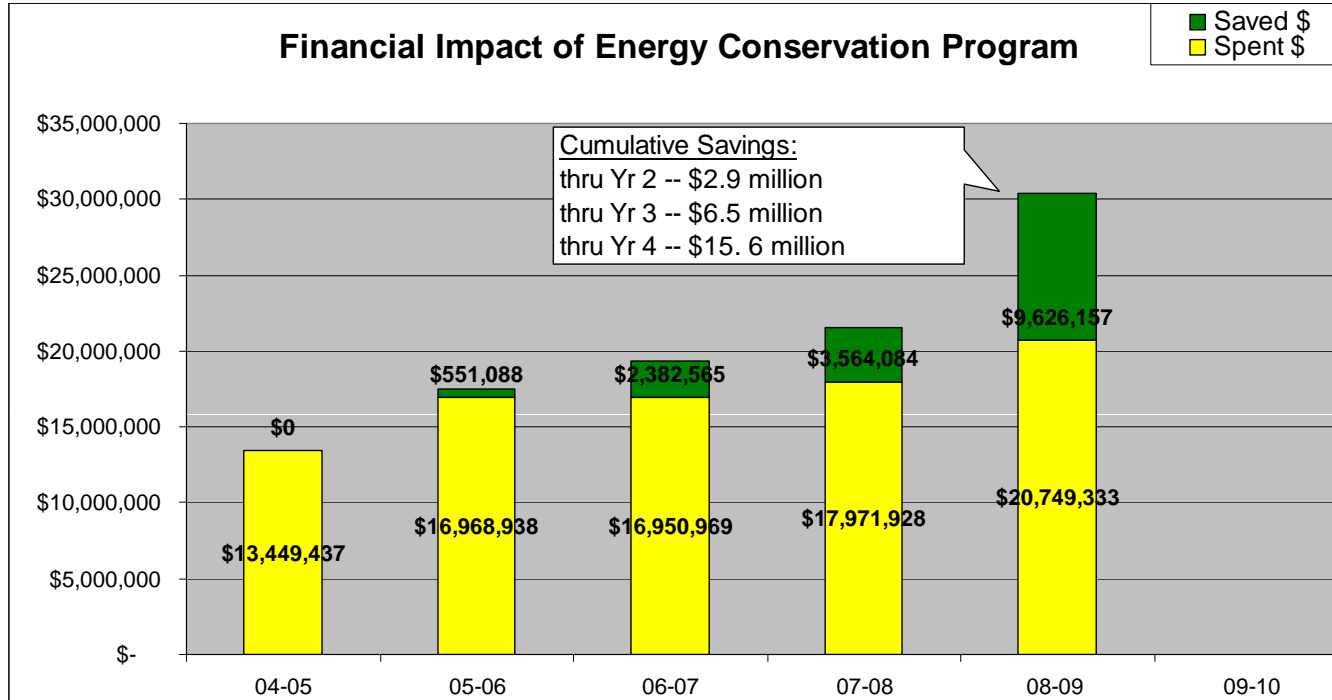
Greening DCPS



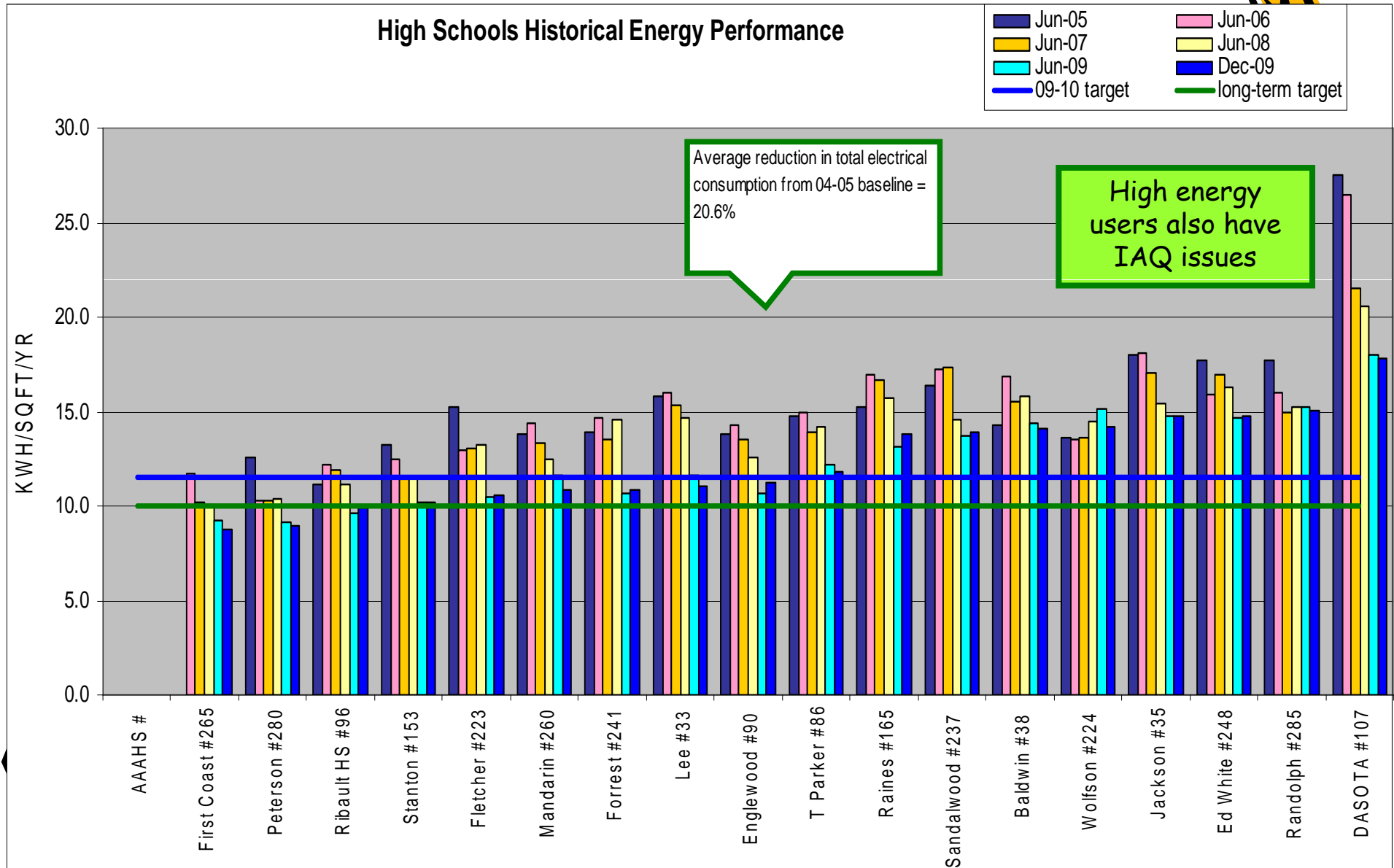
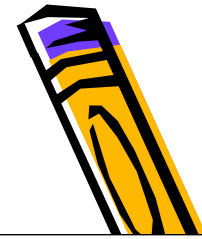
	Then	Now
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Conservation •EMCS •Chiller Plants •Occustats	Very little Low Delta T AC on 24/7, no setpoint limits	Default to unoccupied; notification for events Correct Delta T Occupied/unoccupied with setpoint limits
Commissioning	Construction phase, EMCS only	Design, construction, post construction, MEP focus
Awareness & Education	Energy/Water - none Recycling - sporadic	Green Champions in 155 schools promoting sustainability



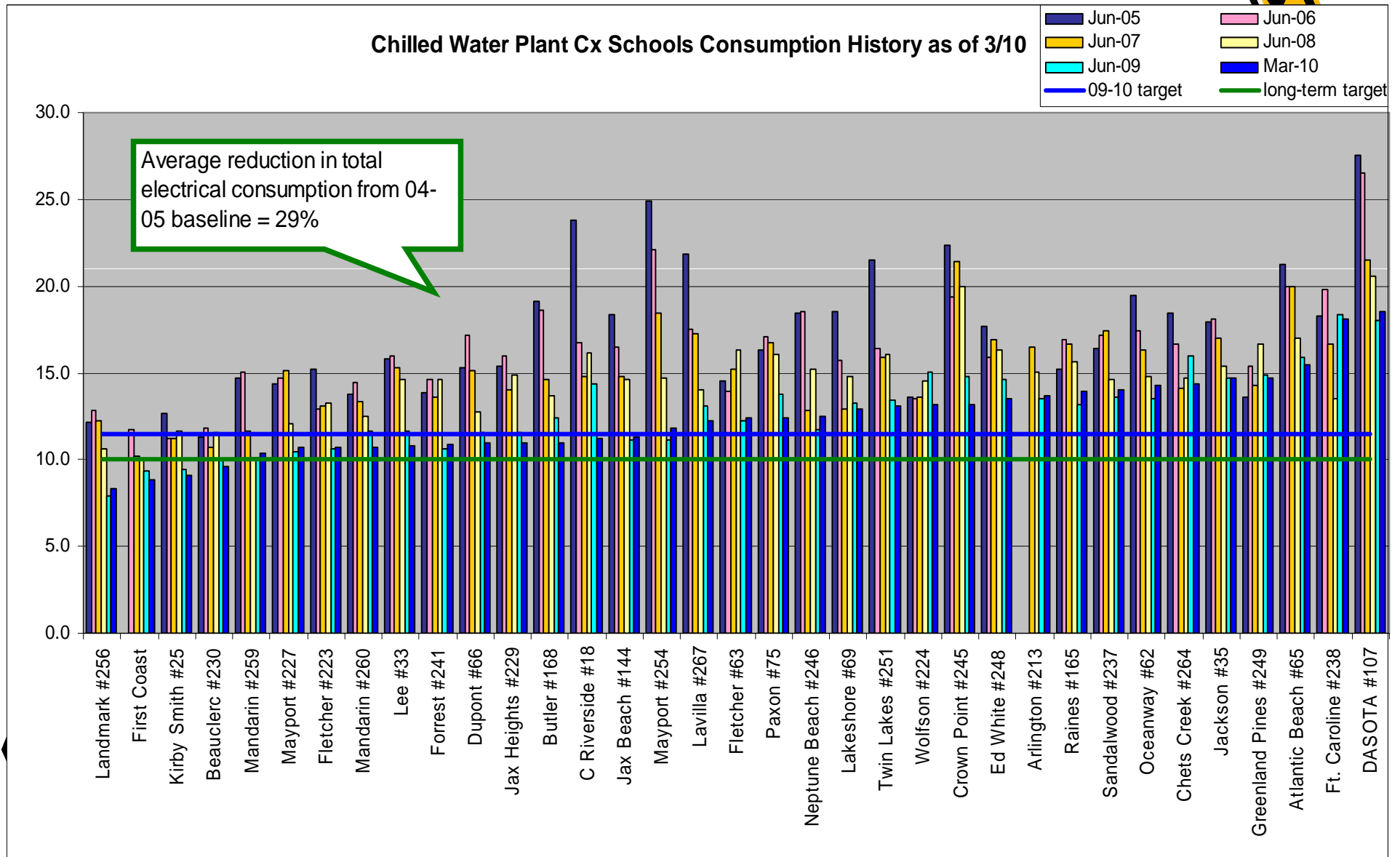
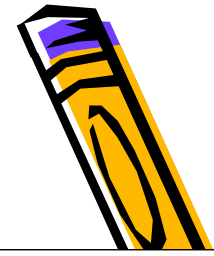
Utility Benchmarking



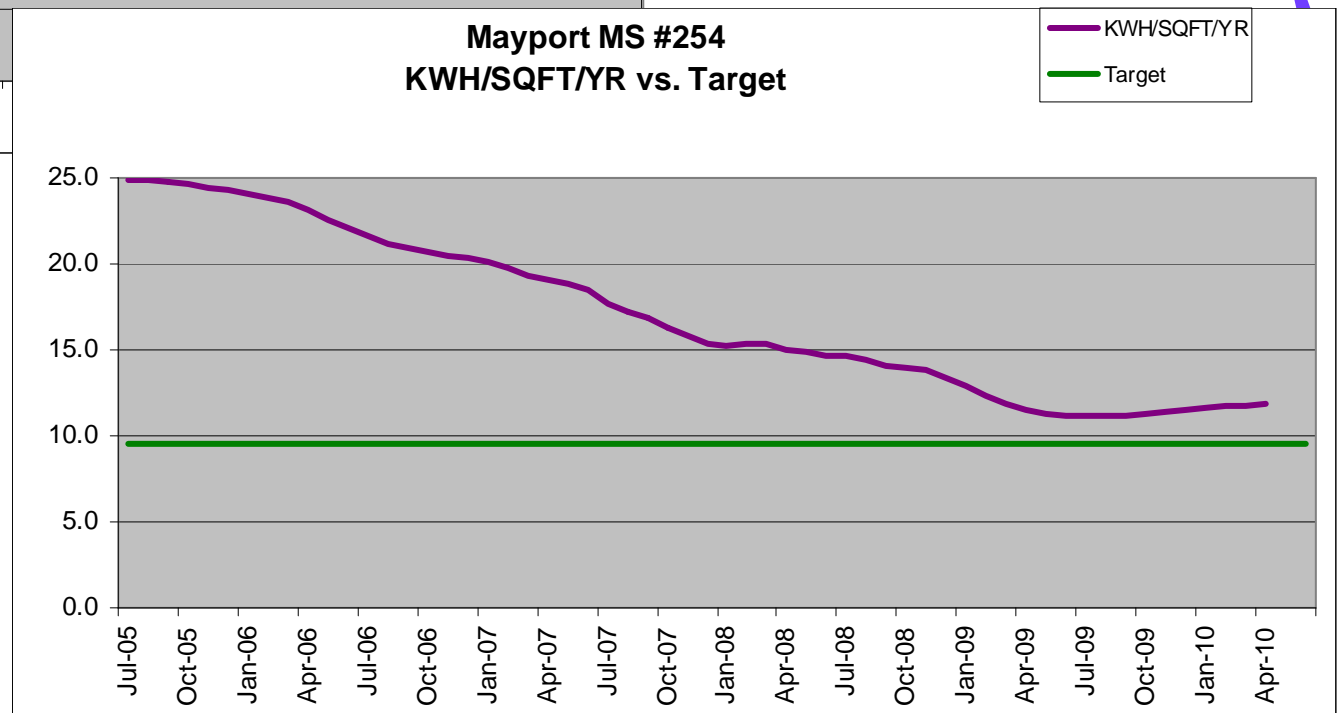
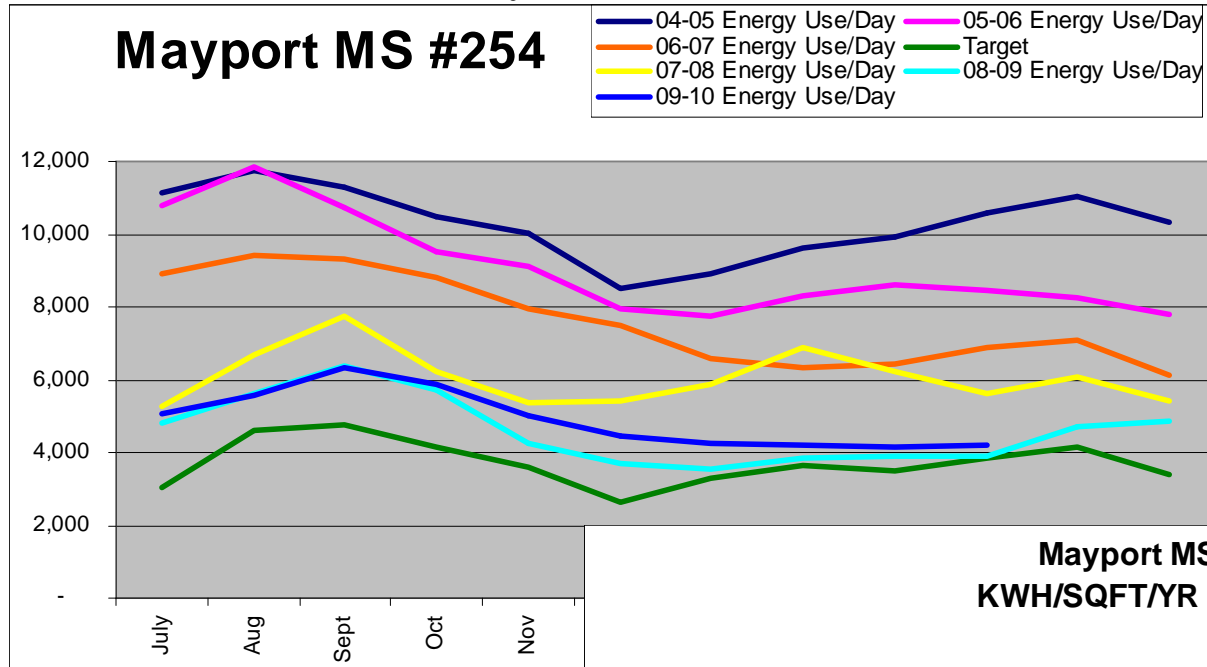
Utility Benchmarking



Utility Benchmarking



Utility Benchmarking



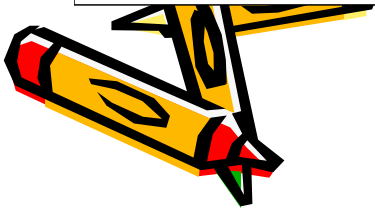
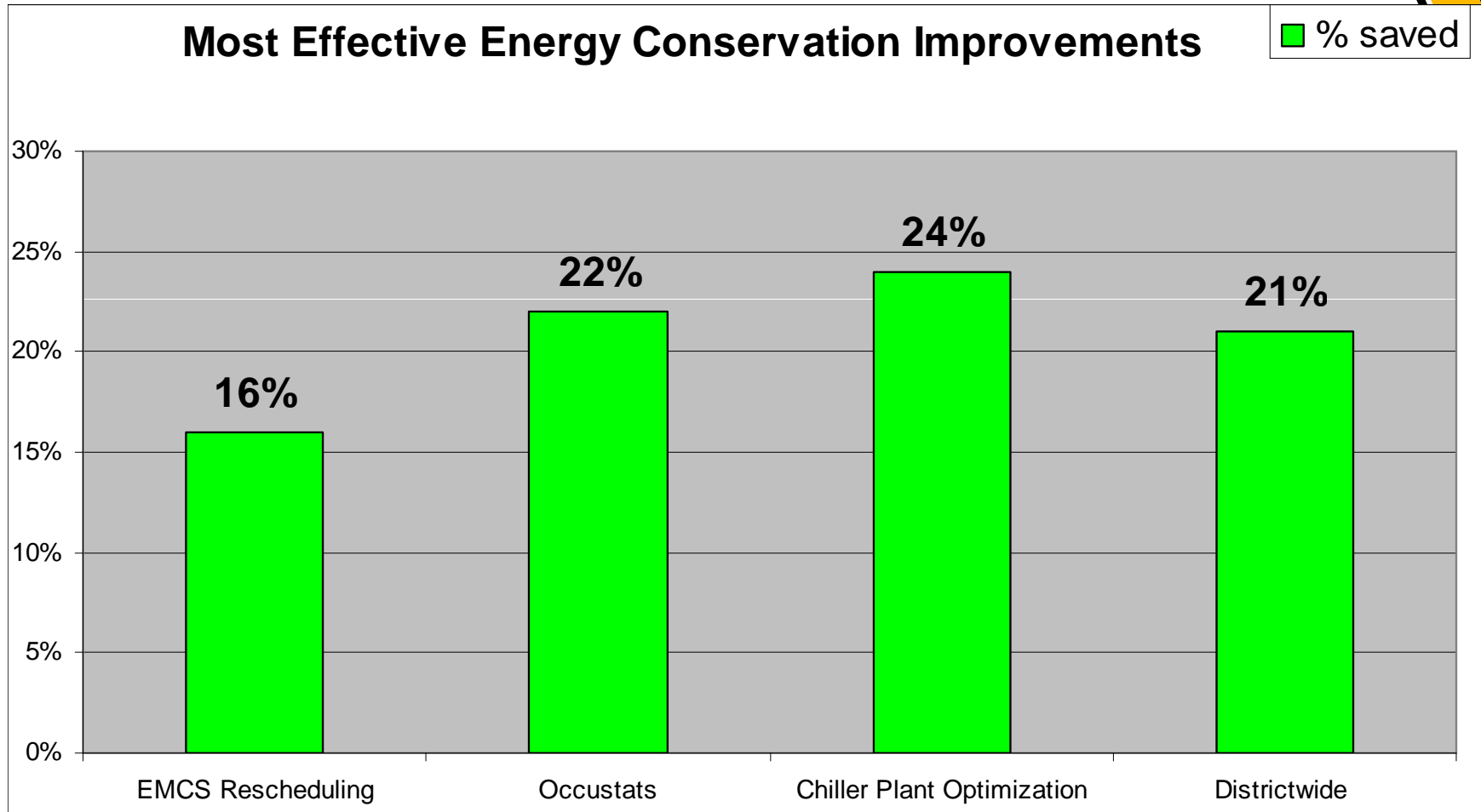
Greening DCPS



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Conservation Improvements



EMCS Scheduling/Optimization

16% saved

- Guidelines set, conveyed, enforced
- Central Office notification for events
- Spring, summer, winter break shut down procedures
- Energy efficient sequences of operation
- Operating schedules
 - temperature ~ staff occupancy
 - ventilation ~ student occupancy

July 1st reset all afterhours events



Occustats - 22% saved

- Portables and non-EMCS classrooms
- Setback thermostat & occupancy sensor
- Occupied/unoccupied setpoint limits comply with guidelines
- Required extra Cx effort

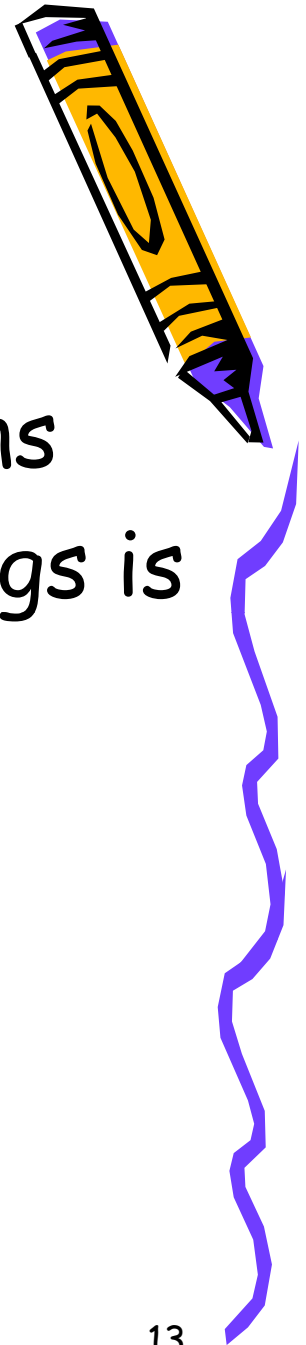


Chiller Plant Optimization

24% saved

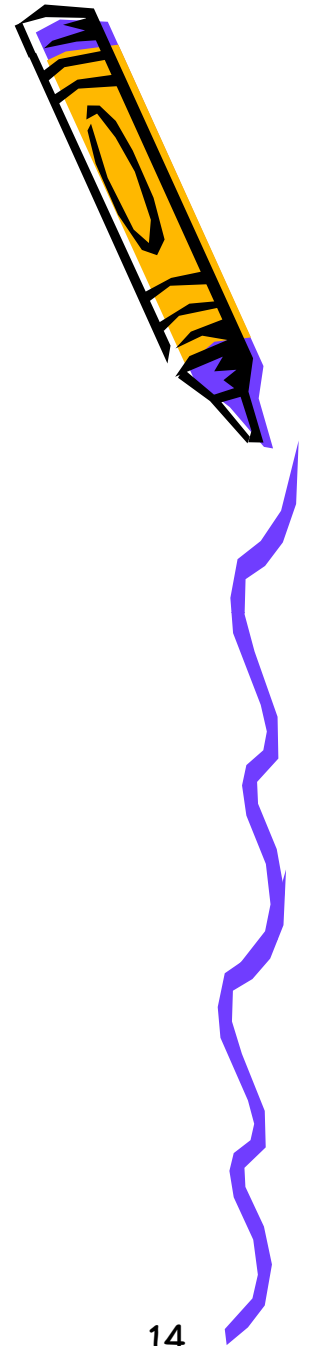
- Analysis of existing operation
- Hydronic & control modifications
- Ensures chilled water to buildings is at design temperature
- Right-size number of chillers operating to meet building load
- Improves dehumidification

- allows for space temperature setpoints to be increased

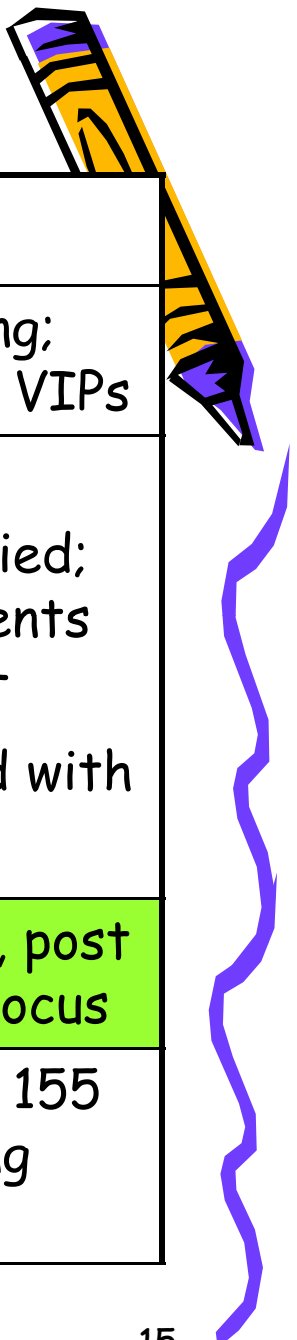


Conservation Improvements


- Funded by Major Maintenance
- Performed by annual mechanical and electrical contractors and in-house workforce
- Grants
 - SunSmart Schools Grant
 - Energy Conservation Block Grant
 - Federal DOE Impact Aid Grant
- Future
 - Performance Contracting?
 - Bonds?
 - Other financing tools?



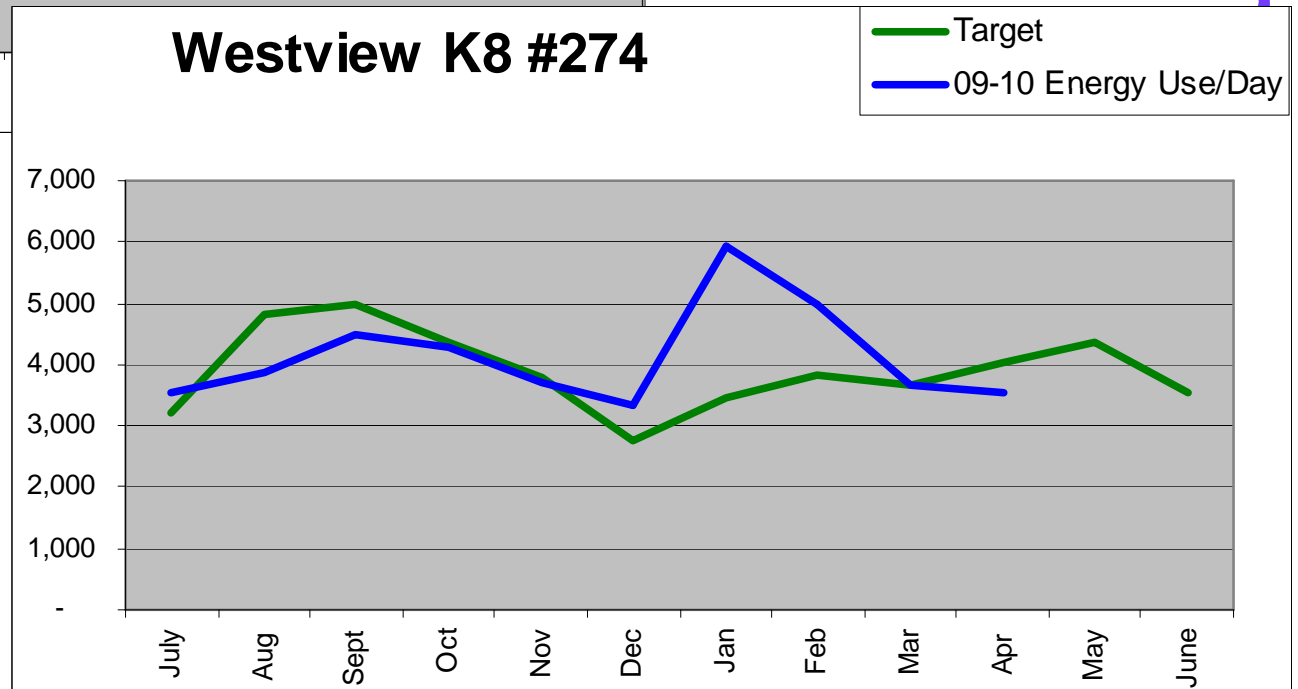
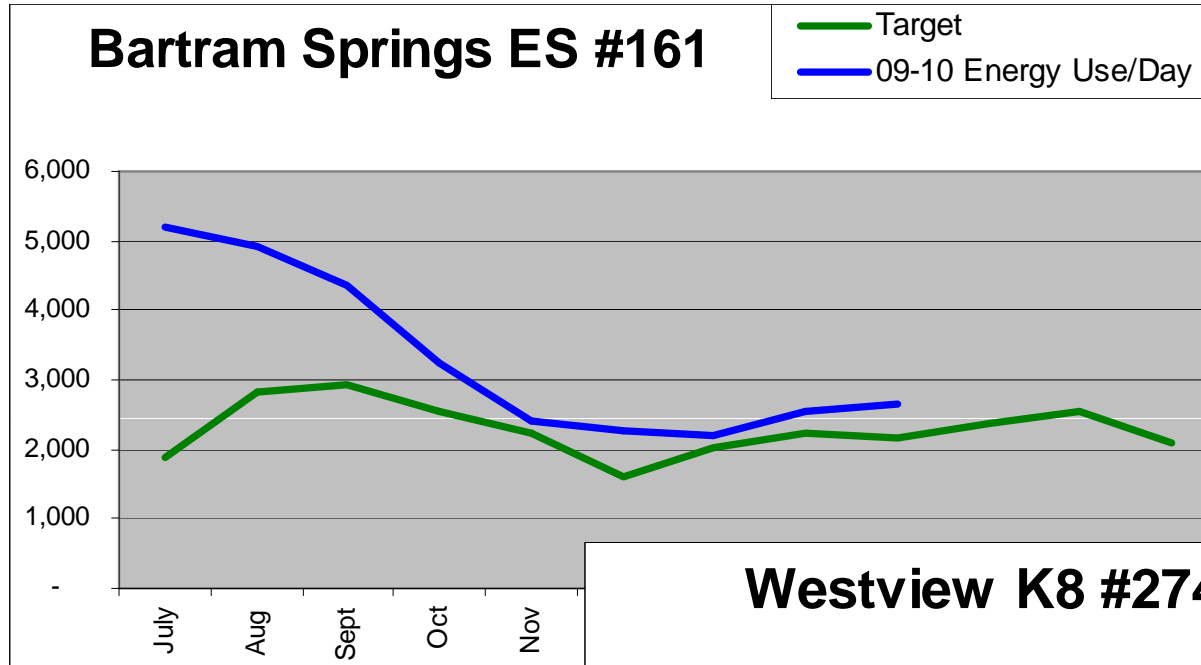
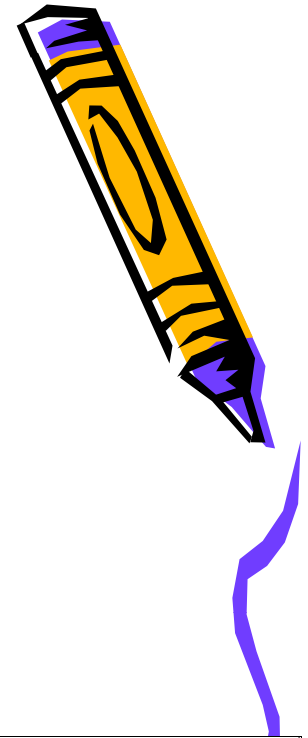
Greening DCPS



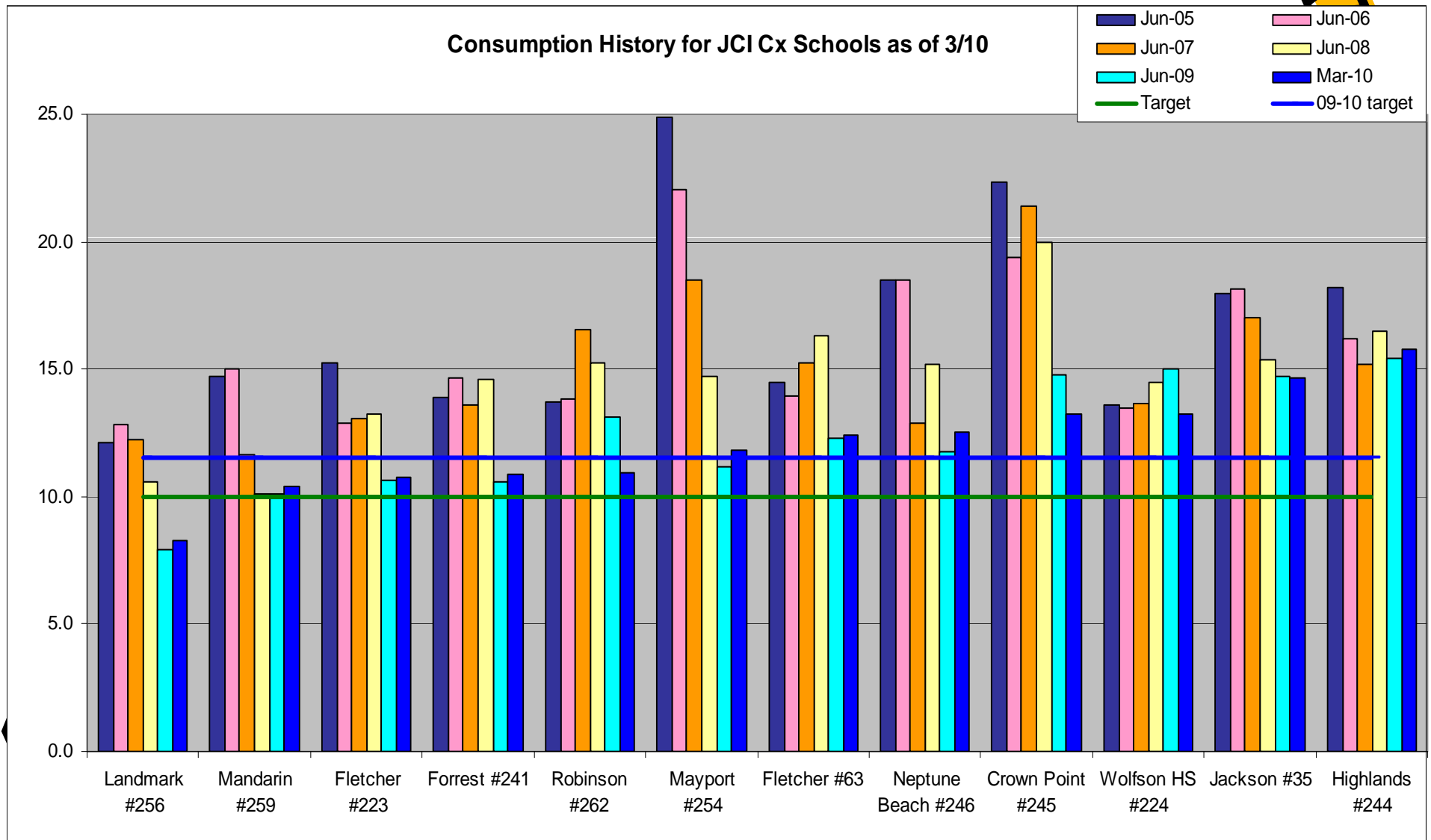
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Commissioning - New Schools

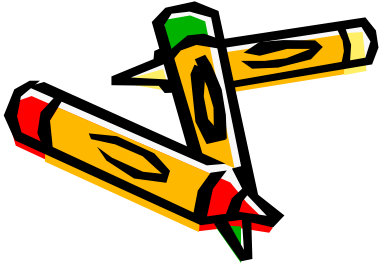


Commissioning - Existing Schools

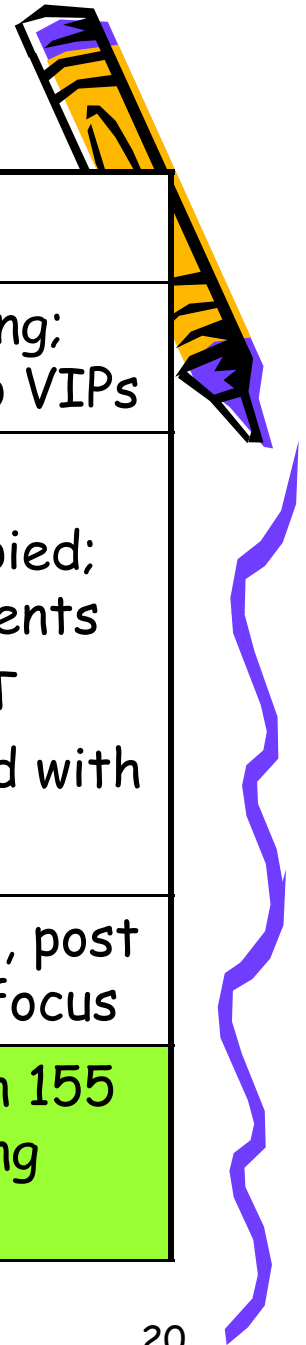


Commissioning

- Very effective
 - Correct resource/skill set and correct scope
 - Design, construction, post construction
- Not as effective
 - Incorrect resource/skill set and/or insufficient scope
 - Not performed in all phases
- Significant energy savings when done correctly
- Benchmarking and monitoring play key role
- Find & correct issues early to keep costs down
- Effective management of issues log is critical



Greening DCPS



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Awareness/Education

- Culture change
- Media attention to sustainability
- Awareness/Behavior component became...

Green Champions!

- **Green Champions** promote sustainability
- **Green Champion** objectives:
 1. Reduce operating costs by eliminating waste
 2. Conserve natural resources
 3. Incorporate lessons in environmental stewardship and science into curriculum

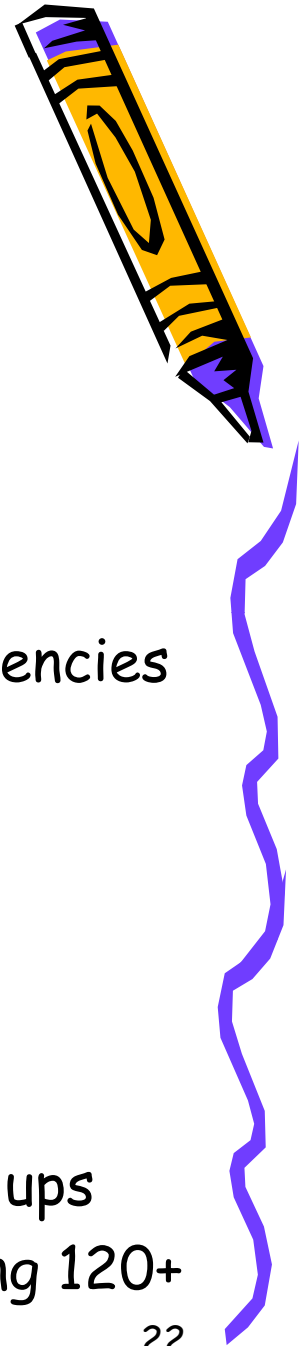
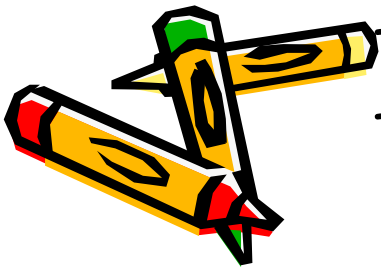


Awareness/Education

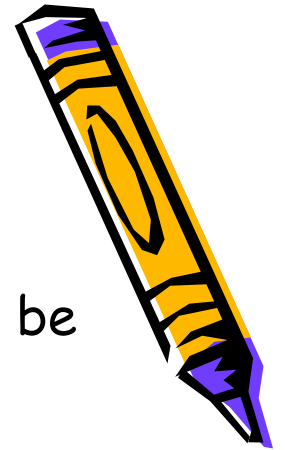
- 155+ schools with **Green Champions**
- Awareness meetings
- Events to promote energy, water conservation and recycling
 - Energy and water surveys; reporting deficiencies
 - Recycle zones in cafeterias; bin decorating contests; Recycle Idol
 - Paper Retriever and Adopt-A-School
 - ELFS

- **2010 Green Champion of the Year**

- 15 schools won honorable mentions, runner ups
- Sandalwood HS won competition by engaging 120+ students, 14 organizations

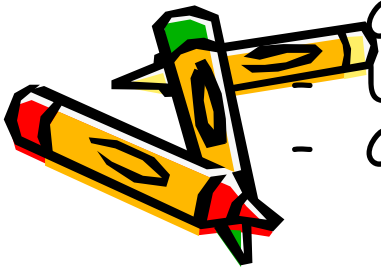


Green Champion of the Year



Activities include:

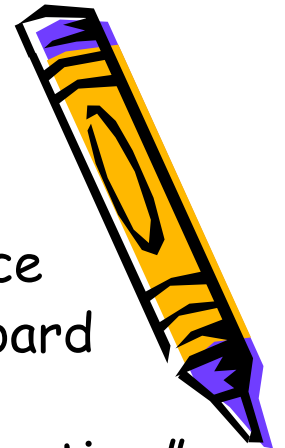
- Posters signed by students committing to recycle, be sustainable
- Green tips in daily/weekly announcements
- Poster, T-shirt, environmental trivia, bird-feeder, photography contests; items sold at school carnival
- Collect coupons, used greeting cards; send to troops, nursing homes, Haiti relief
- Melt used crayons to make chunky crayons for disabled students
- Planting trees, shrubs, flower gardens, vegetable gardens, butterfly gardens; (materials donated by local businesses); plastic bottle planters
- Campus clean up; leaves used for mulch or compost; art contest using collected materials
- Adopt-A-Road in front of school, clean up Little Jetties, Castaway Island, Dutton Island, Ed Austin Park
- Use shredded paper to make paper, line pet store cages
- Collect, clean, repair items for sale at school thrift store

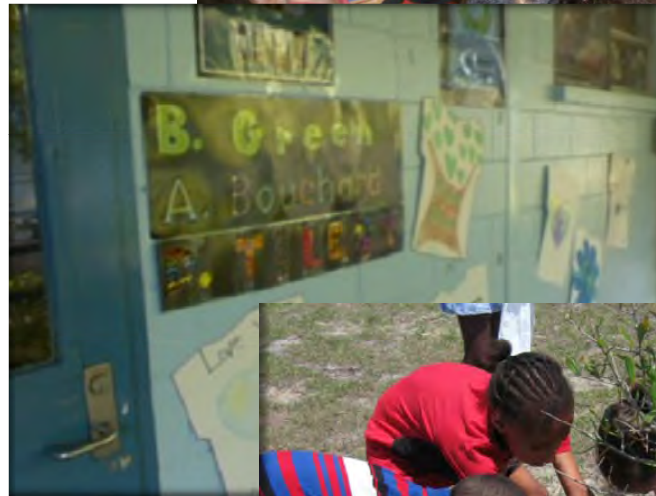


Green Champion of the Year

Activities include:

- Energy/water patrol; report problems to Maintenance
- Make note pads out of gently-used paper and cardboard food boxes; provide to teachers/students
- Signs on paper towel dispensers "be kind, use one at a time"
- Video productions, Powerpoint presentations, play productions by kids for kids
- Fundraiser to Adopt-A-Manatee
- Use of free resources from partners, guest speakers, and on-line; field trips to Advanced Disposal recycling center
- Collect air conditioning system condensate to water landscaping
- Students use homemade solar panels to cook hotdogs for school carnival
- Reuse and exchange gently-used books
- Wear Green Day to celebrate the school "going green"
- Don't let the Litter Monster trash our school!





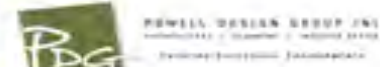




ECPS Green Champions
grew sustainable kids
and wildflowers!



We ♥ our sponsors! 😊



Certified Control Systems



Summarize



- Greening of DCPS is well underway, achieving measurable and sustainable results
- Savings achieved by setting goals, obtaining stakeholder support, striving for continuous improvement
- Future plans ...
 - Evaluate creative financing/contracting tools
 - Expand **Green Champions**
 - Evaluate new technologies
- Letting the community know
 - Community events, Sustainability Symposium, Webinars, WJCT School Matters, Times-Union, Jax Business Journal, Board Workshop

