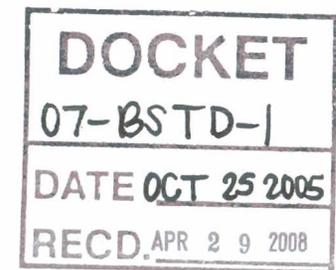


Inclusion of Cool Ducts in Nonresidential Title 24 Mandatory Requirements

Hashem Akbari
Lawrence Berkeley National Laboratory

telephone: 510/486-4287
e_mail: H_Akbari@LBL.gov

October 25, 2005
Sacramento, CA



Cool Duct Benefits

F Ducts stay cool in sun if they have

- high thermal emittance (≥ 0.75) and high solar reflectance (≥ 0.7)

F Cool ducts reduce

- building cooling electricity use
- peak power demand



Scope

F Cool ducts for non-residential buildings

- New study
- Both small and large buildings
- Exposed rooftop ducts

F Cool ducts also applies to residential buildings



Methodology

- F** Review measure availability and cost
 - technologies, market share
 - manufacturers, distribution
 - availability, cost
 - useful life
- F** Perform building cost/benefit analysis
 - evaluate measured energy savings
 - use DOE-2 to simulate cooling and heating energy use
 - net savings = cooling savings - heating penalty
- F** Project state-wide savings



Measured Data

- F Three systems at California State University, Sacramento; with R6 nominal insulation

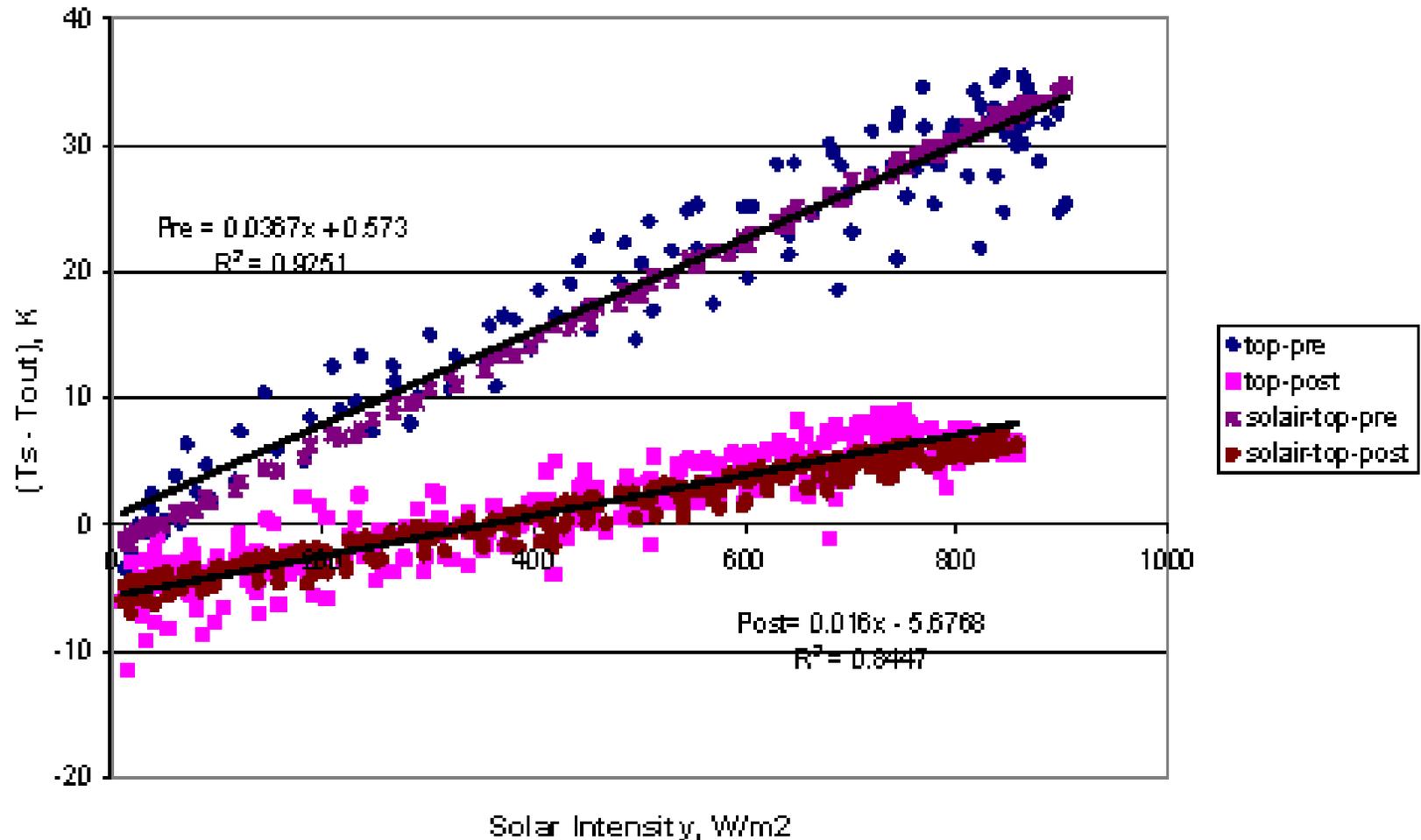


- F Estimated annual savings 5-20 MJ per m² of duct surface area (6-13 kWh/m²)
- F In new applications, simple payback 2-5 years



Duct Surface Temperature

Daytime Surface Temperature: Humboldt; Berdahl's sky temp dep



Air Temperature Rise in the Ducts

Facilities Building: System A

