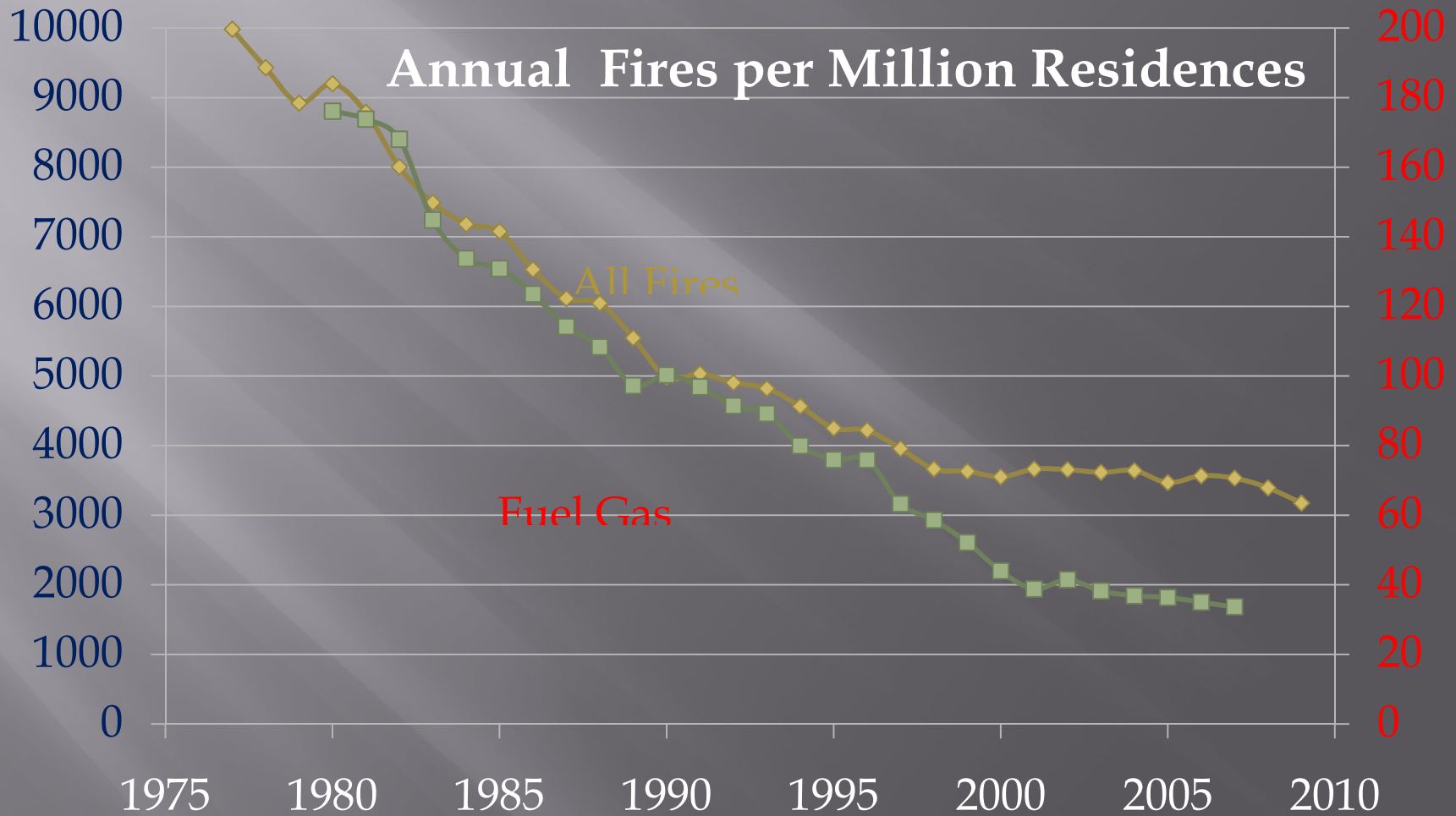


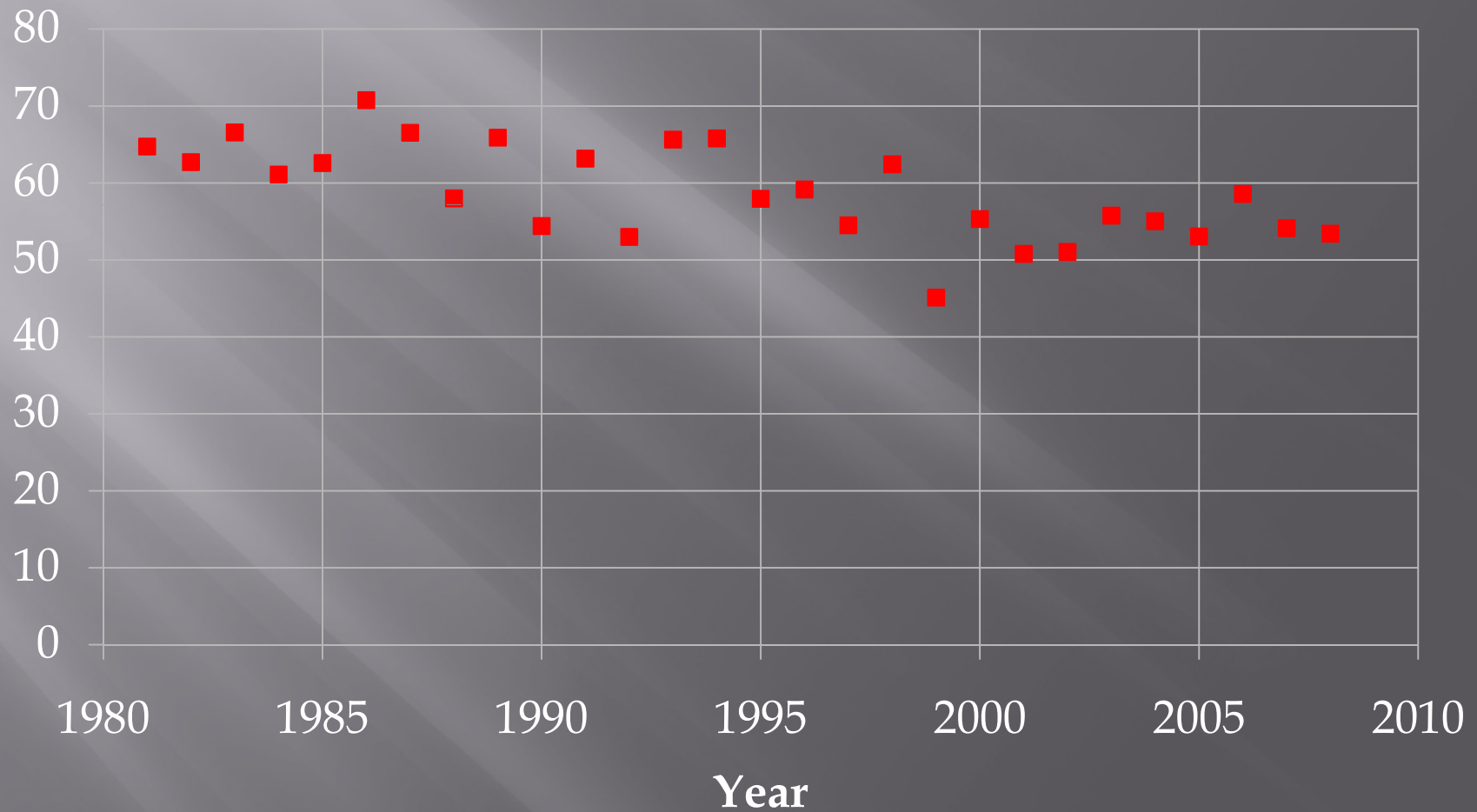
RESIDENTIAL FUEL GAS LIGHTNING FIRES IN THE USA – NFIRS/NFPA DATA

Michael F. Stringfellow
Chief Scientist
PowerCET Corporation

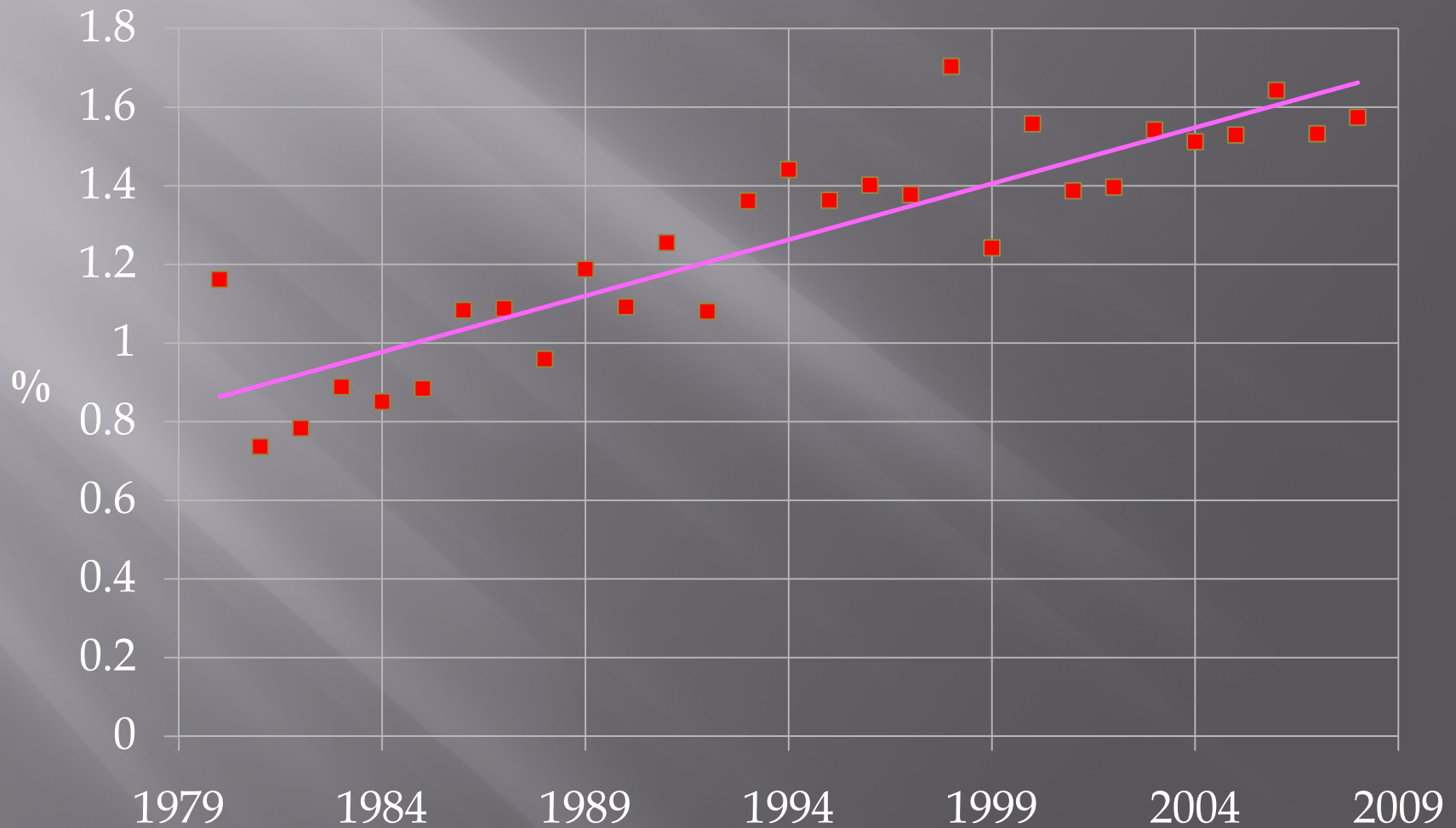
Normalized Residential Fire Incidence



Residential Lightning Fires per Million Homes

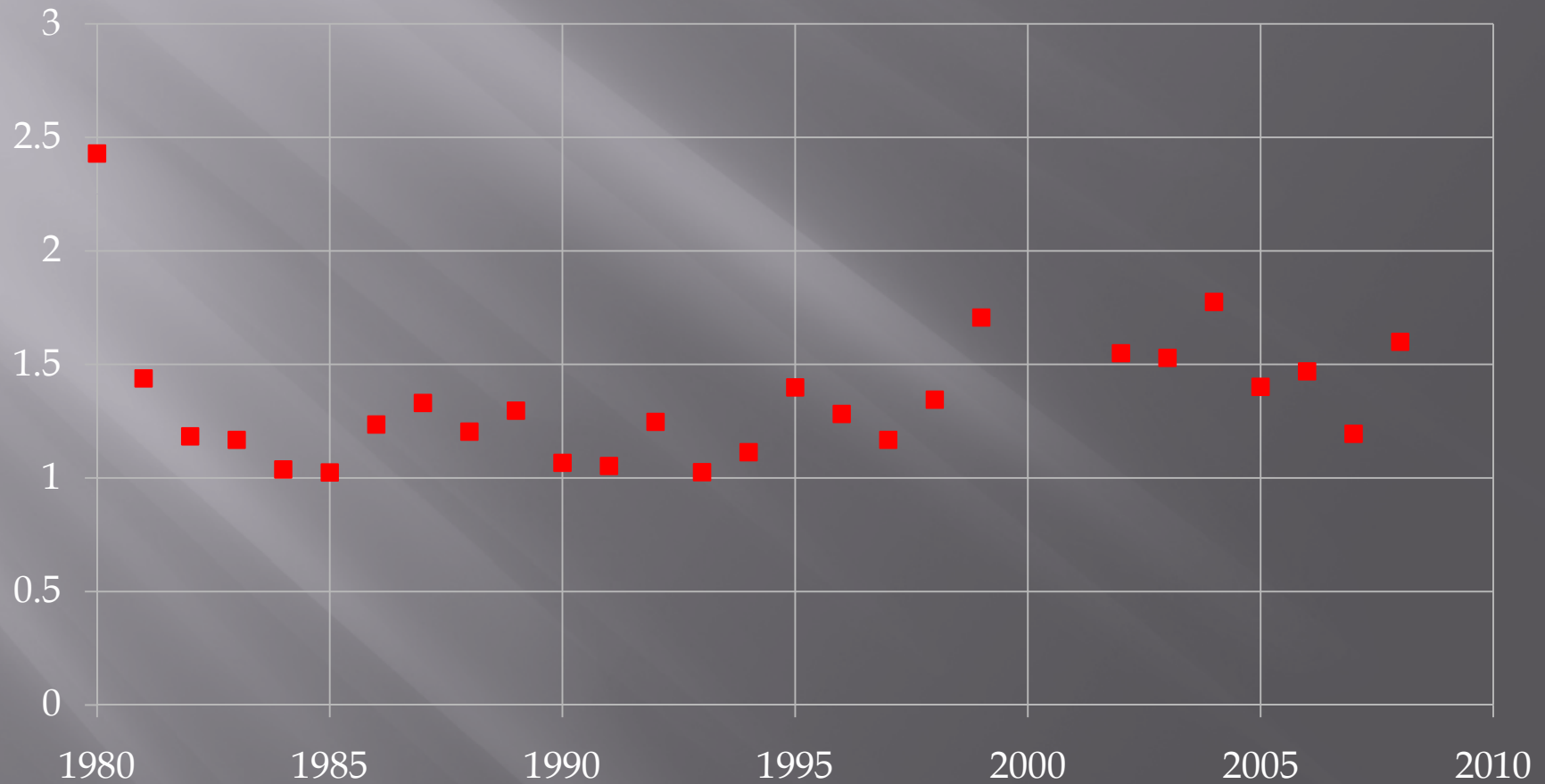


Residential Lightning Fires as Percentage of All Fires

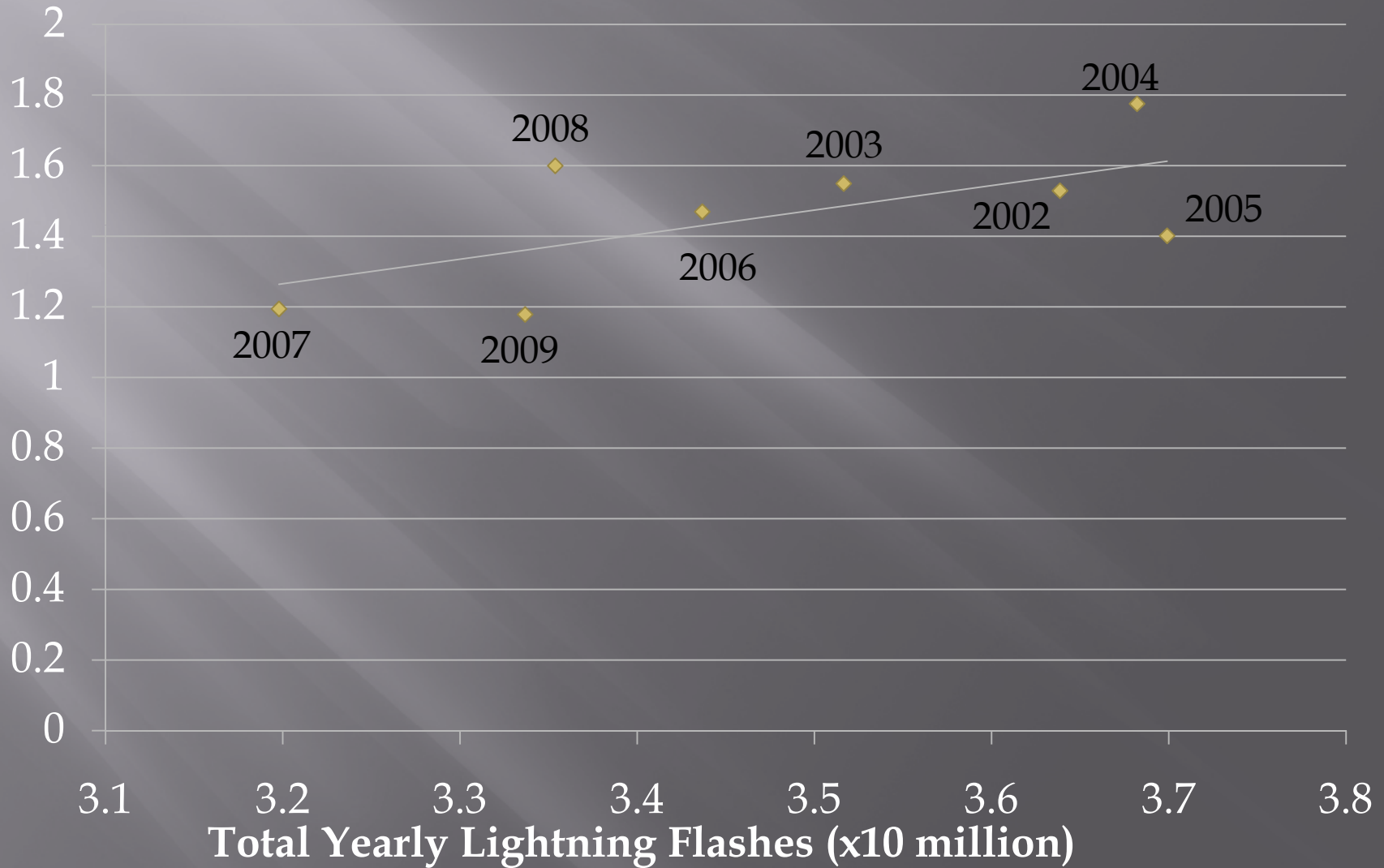


Residential Lightning Fuel Gas Fires

Lightning Gas Fires per Million Residences

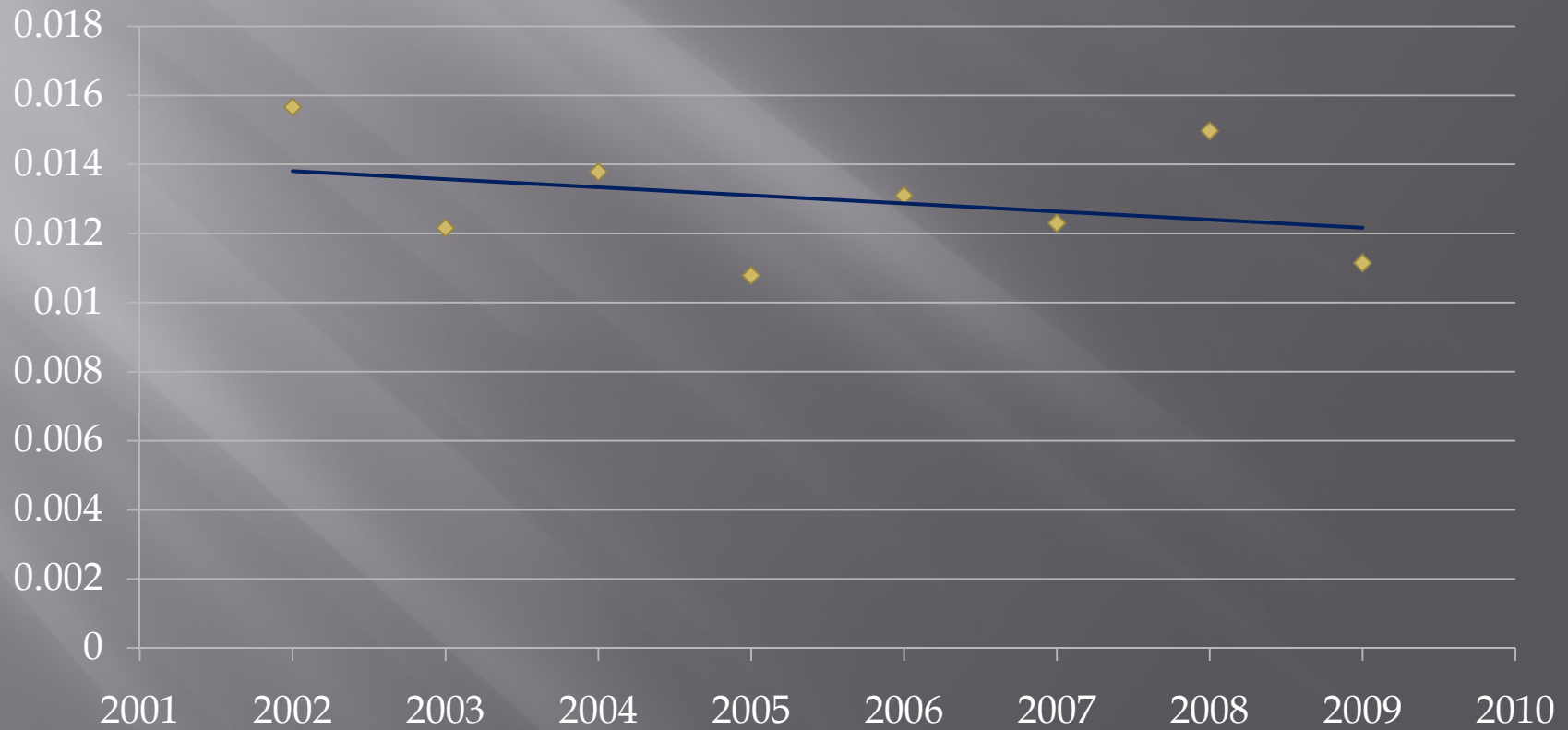


Lightning Fuel Gas Fires per Million Residences v Lightning Flashes



Lightning Fuel Gas Fires Normalized for Lightning Incidence

Lightning Gas Fires per Million Residences and per
Million Lightning Flashes



Objects Ignited by Lightning

- ▣ NFIRS/NFPA
 - Structure -71%
 - Electrical system – 22%
 - Gas system – 7%
- ▣ Stringfellow (2011)
 - Structure – 47%
 - Electrical system – 45%
 - Gas system – 8%

What the numbers mean

- ▣ Lightning Fires
 - Increasing as percentage of all fires
 - Represent ~1.6% of all fires
- ▣ Fuel Gas Fires
 - Decreasing faster than all fires
 - Half result from “leaks and breaks”
 - Represent ~ 1% of all fires

Lightning + fuel gas
represent 0.04% of all
residential fires

Lightning Fuel Gas Fires

- ▣ Represent 0.04% of all residential fires
- ▣ Represent 3% of all lightning fires
- ▣ Represent 5% of all fuel gas fires
- ▣ Proportional to lightning incidence
- ▣ Decreased 15% between 2000 and 2010
- ▣ Currently ~ 150-200 per year reported
 - ▣ 125-175 in conventional “black iron” pipe systems
 - ▣ 25-50 in CSST systems
 - 0.004% to 0.012% of all residential fires

Summary

- ▣ Residential lightning fires decreasing more slowly than fires from other causes
 - Represent an increasing percentage of fires
 - Structure and electrical > 90%
 - ▣ Electrical could comprise ~ 50%
 - Gas systems involved in 3% – 8% of all lightning fires
 - ▣ Both conventional rigid pipe and CSST systems