



IGCC Environmental Profiles

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CH2M HILL

McIlvaine “Hot Topic Hour on IGCC”

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Environmental Permitting for IGCC Plants

- Based on experience with permitting 10 IGCC plants and 2 coal gasification plants
- Developed industry's first "IGCC Permitting Guidelines Manual"
 - EPRI CoalFleet members have access to this manual
- Detailed database of emissions data for IGCC and gasification plants



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Comparison of Air Emission Controls

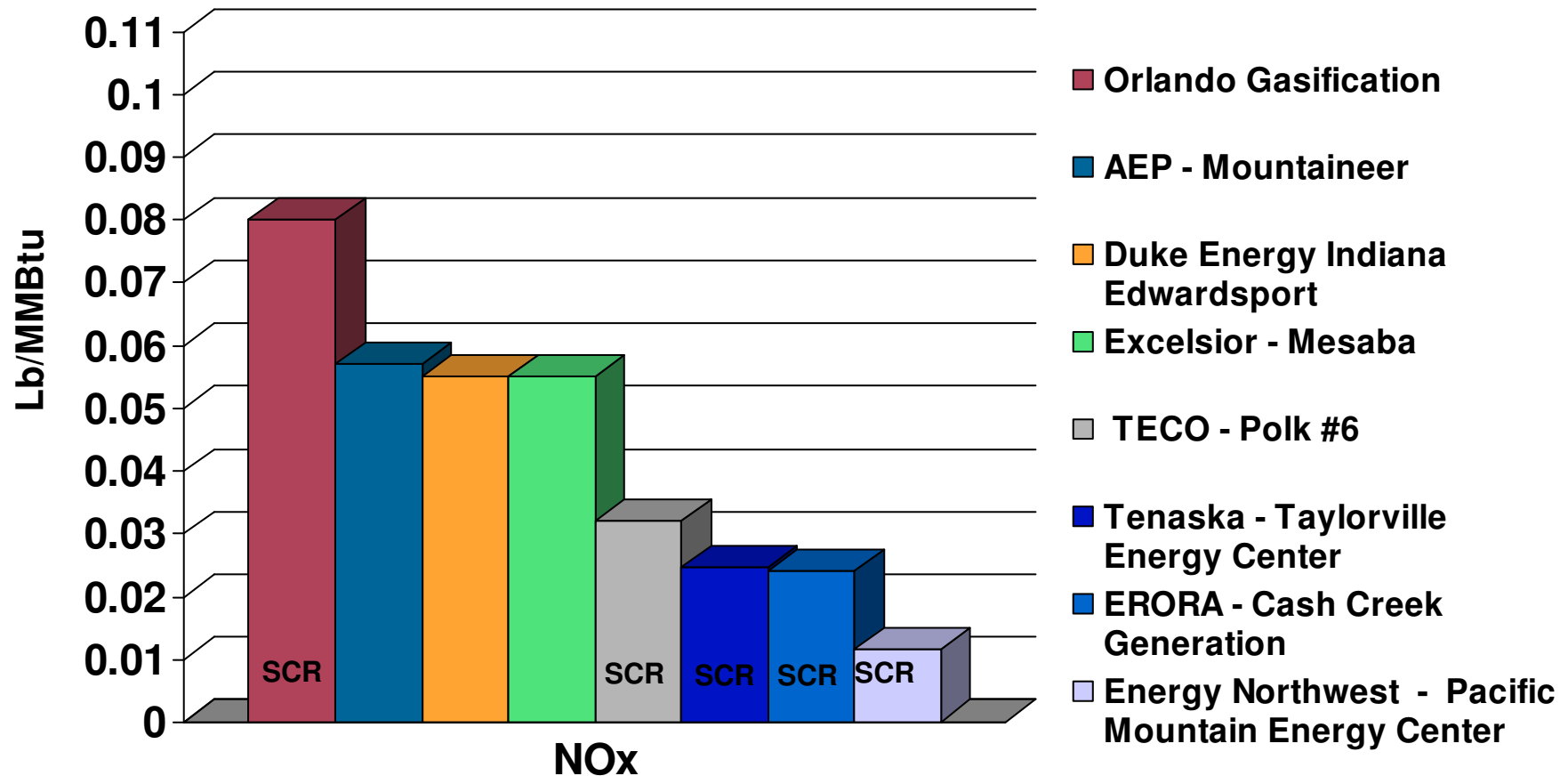
	SO₂	NOx	PM	Mercury
PC	FGD system	Low-NOx burners and SCR	ESP or baghouse	Inject activated carbon into flue gas
IGCC	Acid gas removal system removes >99% H ₂ S from syngas	Syngas moisturization and diluent (N ₂ and steam); SCR option	Wet scrubber, high temperature cyclone, ceramic filter	Syngas flows through carbon bed

Air Emissions

- Unique emission points depend on technology provider
 - Flare
 - Sulfur Recovery Unit tail gas incinerator
 - Sulfuric Acid Plant stack
 - Tank vent incinerators
 - ASU cooling tower
- Start-up and shutdown emissions can be significant

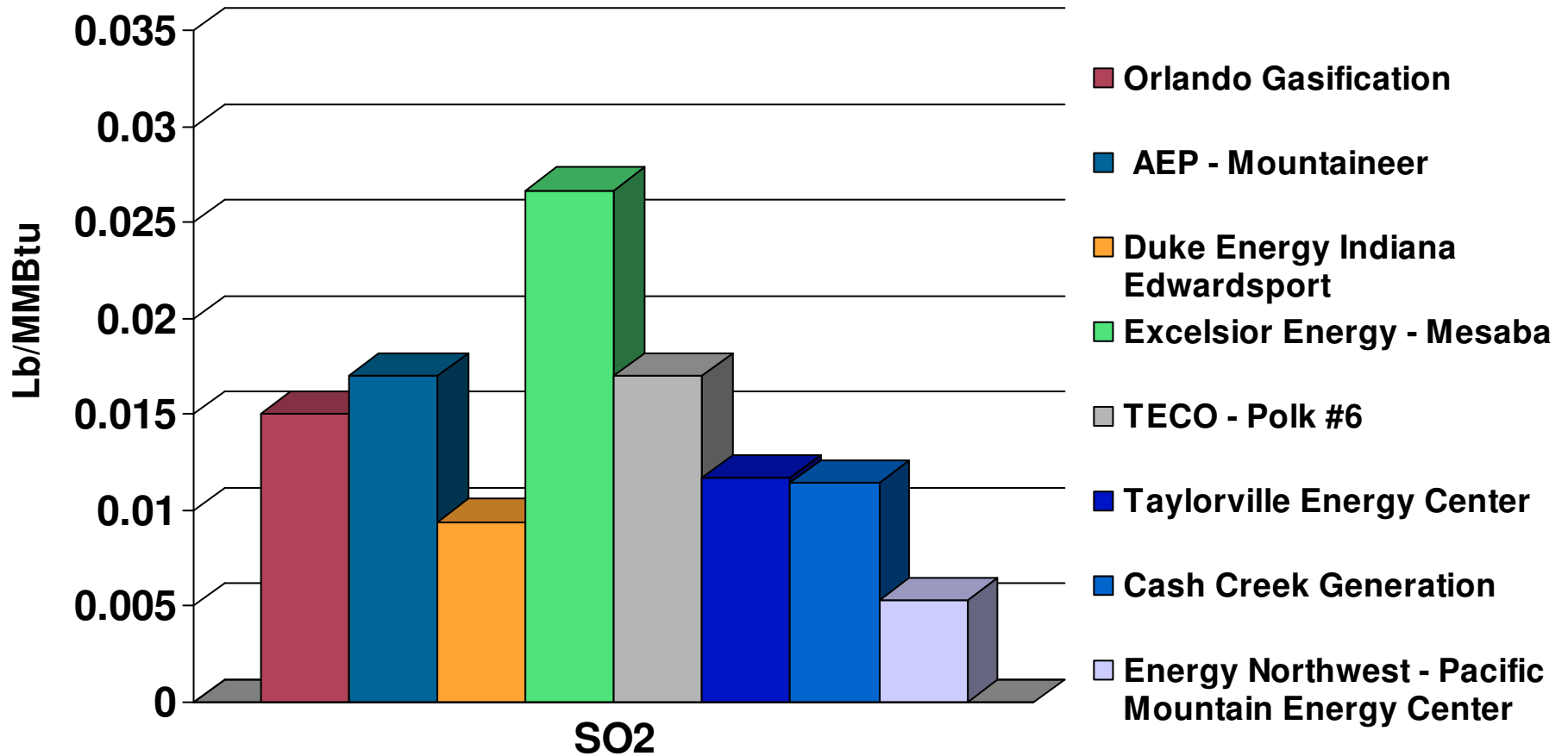


NOx Emission Limit Comparison Gasifier Heat Input Basis



Note: some of these projects have been cancelled

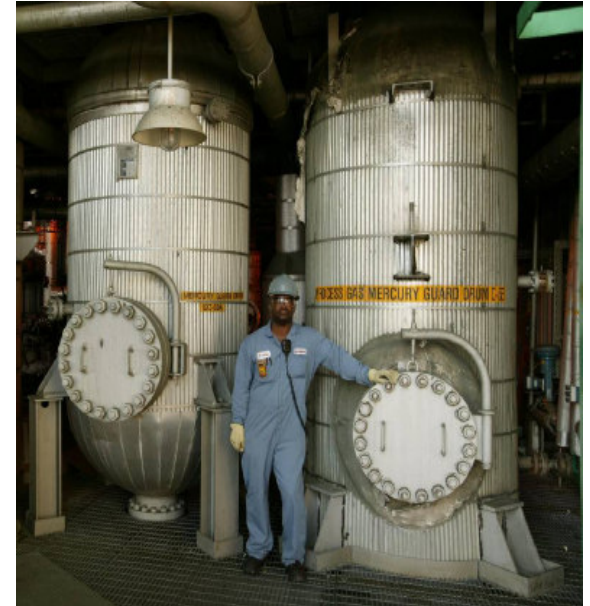
SO₂ Emission Limit Comparison Gasifier Heat Input Basis



Note: some of these projects have been cancelled

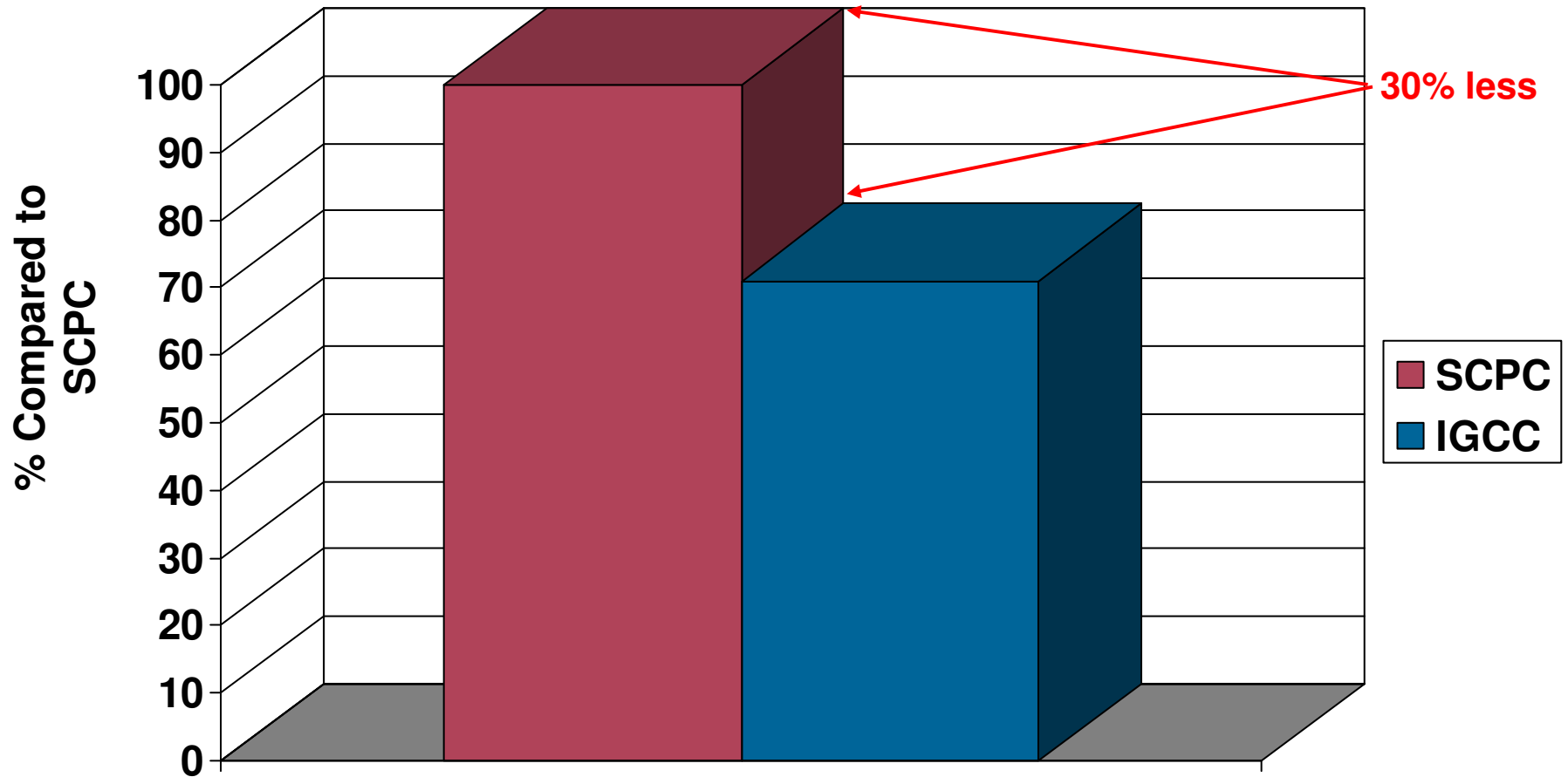
Mercury Removal

- Pre-sulfided activated carbon beds
- Forms a mercury-sulfur complex
- >94% removal of vapor-phase mercury at Eastman Chemical
- Spent carbon disposed of in drums
- Proposed IGCC plants plan to use this technology



Source: Eastman Chemical

Comparison of Water Use



Source: DOE

Liquid Discharges

- IGCC designed for substantial re-use and recycling of process water
- Similar needs as with NGCC and PC
 - Cooling tower blowdown
 - Water treatment wastes
 - Storm water
 - Coal pile runoff

Byproducts

- Ash is removed in molten form, then quenched to form glassy, inert, saleable slag
 - Used for making
 - Cement
 - Asphalt filler
 - Roofing shingles
 - Sand-blasting grit



- Sulfur



- Sulfuric acid



Contact Info

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