

EPA Rules Impacts

AEP's Concerns and That of The Bulk Electric System

Presented to OMB

(12/8/2011)

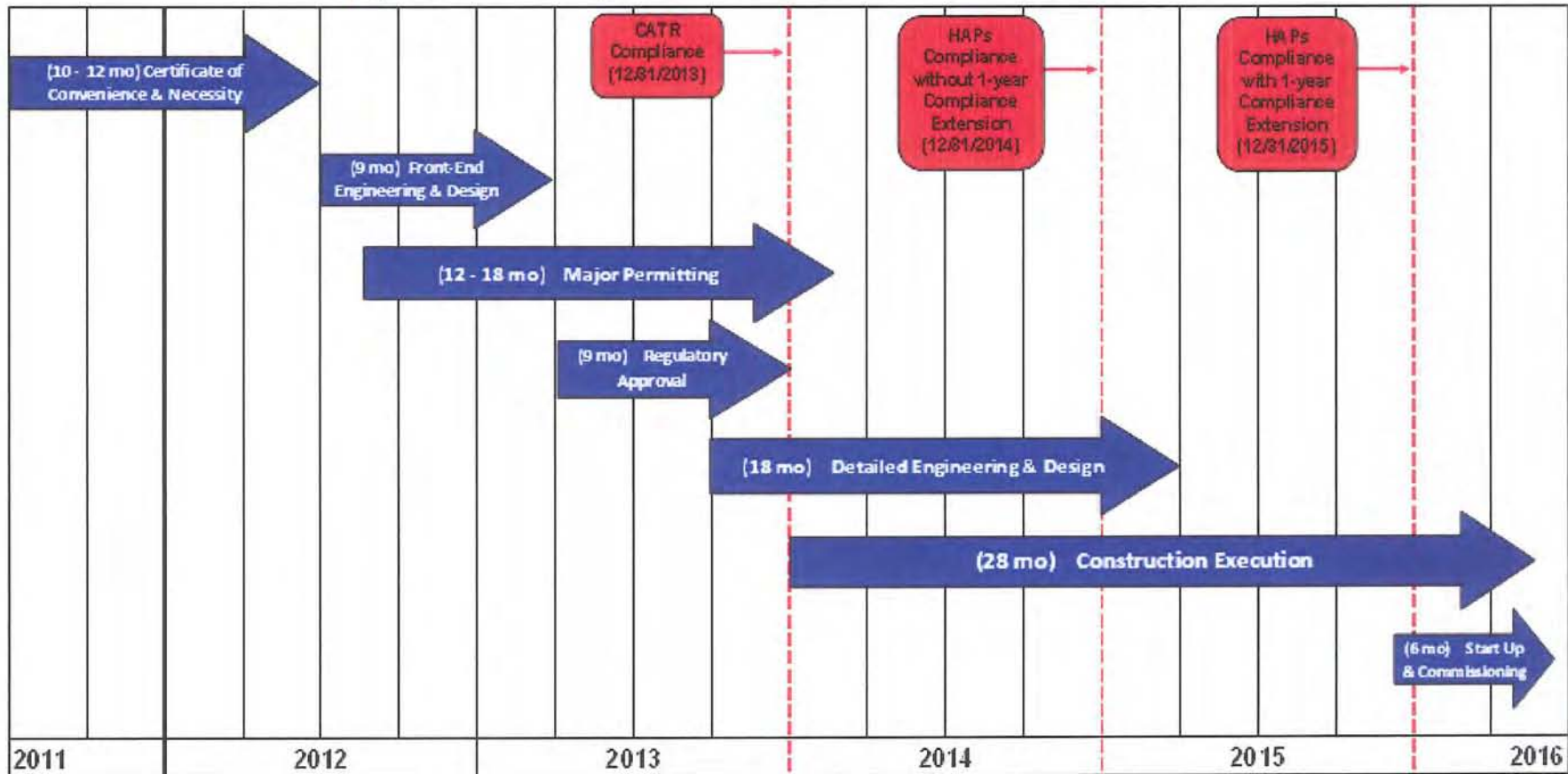
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Effect From the EPA Compliance Deadlines

- Nationally, electric utilities have announced unit retirement plans totaling 48 GW
- AEP will retire 6,000 MW of existing coal-fired generation by Dec. 31, 2014
- AEP estimates it will need to invest \$6 billion to \$8 billion to meet compliance deadlines
- AEP will temporarily (1 – 4 years) idle / curtail 1,000 MW – 6,000 MW
- Timing of compliance creates significant implementation and electrical grid issues
- Deadlines in proposals do not allow enough time to install retrofits and/or replacements
 - An FGD requires approximately 60 months or 5 years to obtain regulatory approval, permit, engineer, procure, and construct
 - Replacement generation combustion turbine facilities require approximately 3 & ½ years, while a combined cycle plant is 5 years to construct
 - Construction safety and productivity will be compromised

Compliance Within Time Frames is Not Feasible

Typical FGD System Construction Timeline.



Electrical Grid Reliability Impacts

- Unit Retirements and Idling of retrofit units will have a significant impact on the Bulk Electric System

- Transmission needs tend to be more localized than regional; their solution is also localized

Example: A unit in western Pennsylvania cannot provide voltage to a deficient area in southern West Virginia

- Transmission Reliability and stranded costs cannot be mitigated unless more time is given for compliance.....enough transmission mitigation cannot be built in time before coal units are forced to retirement sooner

Example: AEP's 528 MW Welsh 2 unit in Texas scheduled to retire in 2014 requires \$80MM over five years to plan, engineer, permit, procure and build the proper transmission mitigation

- Ancillary services provided by many retiring coal unit, such as black start capabilities, voltage/reactive load support and frequency response, are critical to grid stability

Example: These services were critical in the 2003 blackout to help stop the effect of cascading outages, and helped bring the grid back to life as the system was re-energized

Note: The proposed safety valve provision needs to provide for flexibility in assessing critical unit status

Jobs Impact

- The compacted construction window will create a boom-bust situation
- 750 AEP employees could be displaced through premature unit retirements
- Coal Unit retirements will have an impact on industry support jobs with local vendors, contractors and service providers in surrounding communities
- Studies have indicated that every 1 MW of coal-fueled generation supports an average of three indirect jobs in the services sector. For AEP's retiring units, this could equate to 18,000 indirect jobs
- Recent NERA study estimates a loss of 1.65 million job years between 2012 and 2020 due to the EPA rules
- AEP's net jobs impact could be approximately a \$40 million loss in annual wages
- Gas plants staff at 25% of coal plant staffing
- An estimated 170 permanent new jobs could be created by retrofit technologies

Note: OEM vendors such as B&W have stated that the deadlines will pose significant labor and procurement issues

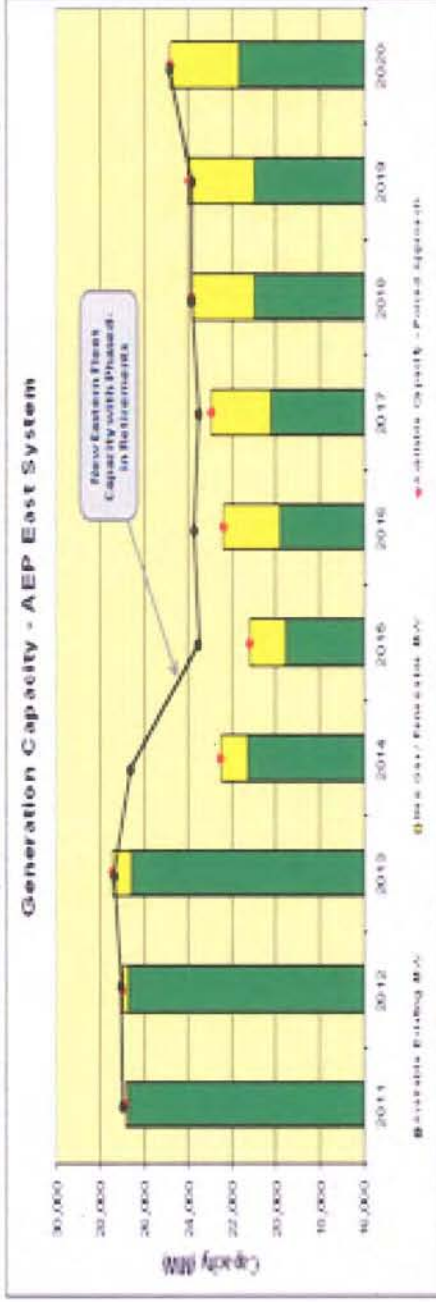
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Economy Impacts

- Compliance costs result in significant Socioeconomic Impacts
- Depending on jurisdiction, AEP customer rates will increase abruptly an estimated 10% - 35%. Such increases will have significant impacts to local, regional and national economies
- Louisville Gas & Electric Company and Kentucky Utilities recently announced expected rate impacts to their customers from the EPA air regulations of as much as 24% and 14%, respectively
- AEP tax revenues will be reduced by approximately \$35 million through lower property and payroll taxes
- Cost impact is exacerbated if all units are required to comply in the same year

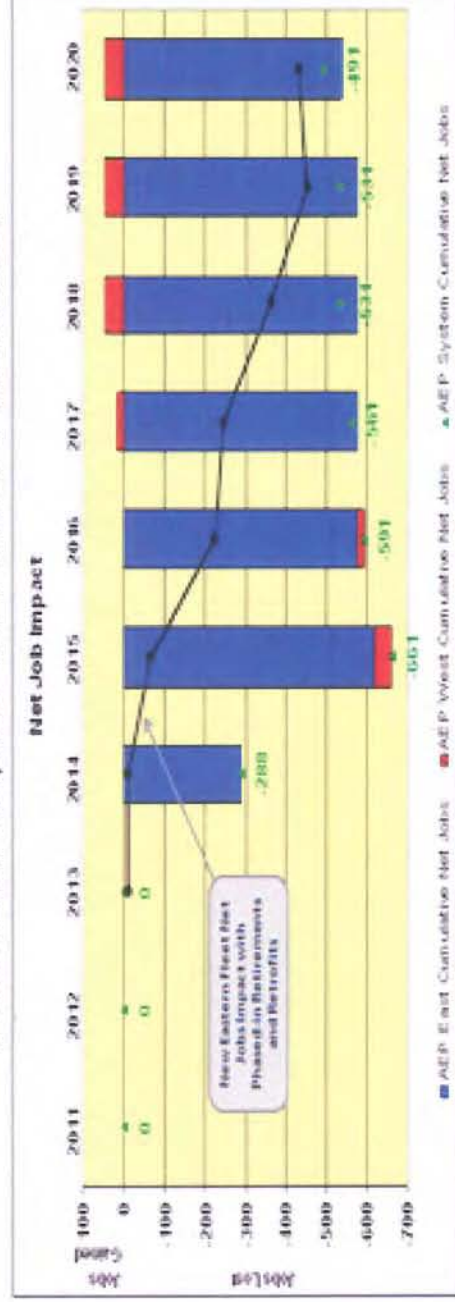
“The Challenge”

Potential Impact of Rules on AEP East Capacity



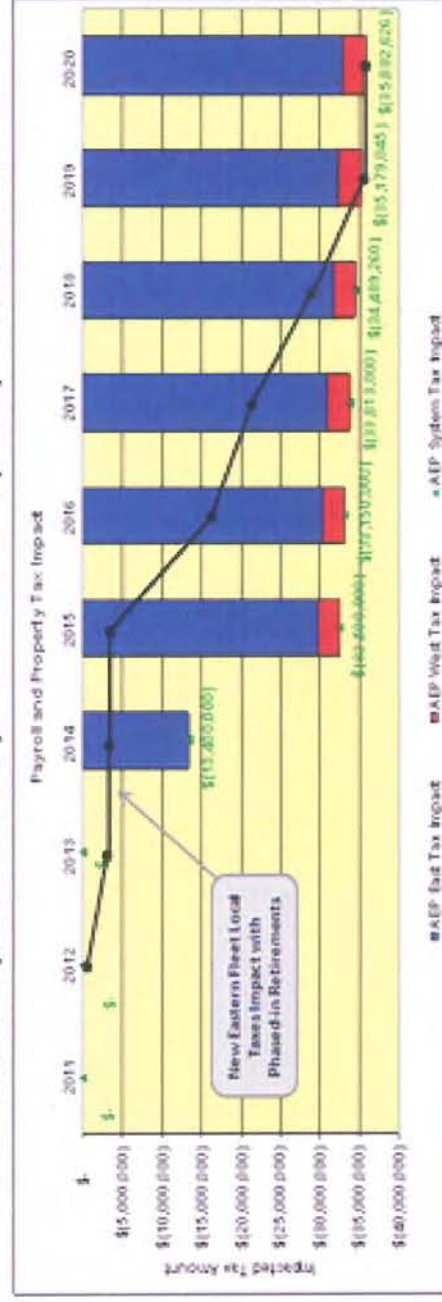
4. This incremental lost capacity from the Pooled Approach includes 2,435,000 of System Restoration capacity, 4,325,000 of Voltage/Reactive Load Support and 4,720,000 of Load Following and Frequency Response capability.

Potential Impact on Power Plant Jobs

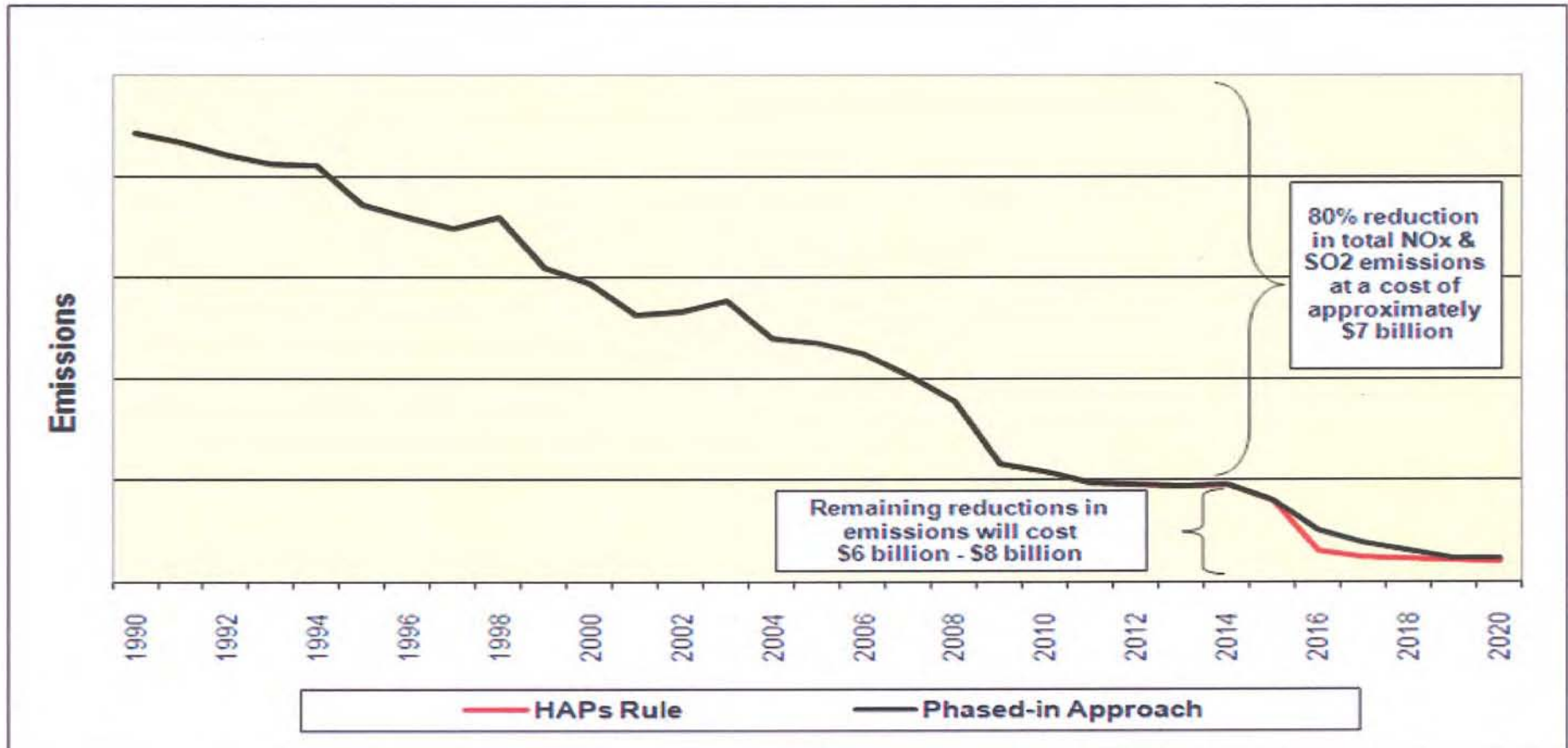


4. A 600-MW centralized coal plant employs approximately 320 people, whereas an equivalent size gas combined-cycle plant employs approximately 30 people.

Potential Impact on Payroll and Property Tax Revenues



AEP Plant Emissions Benefit HAPS vs. Phased Approach



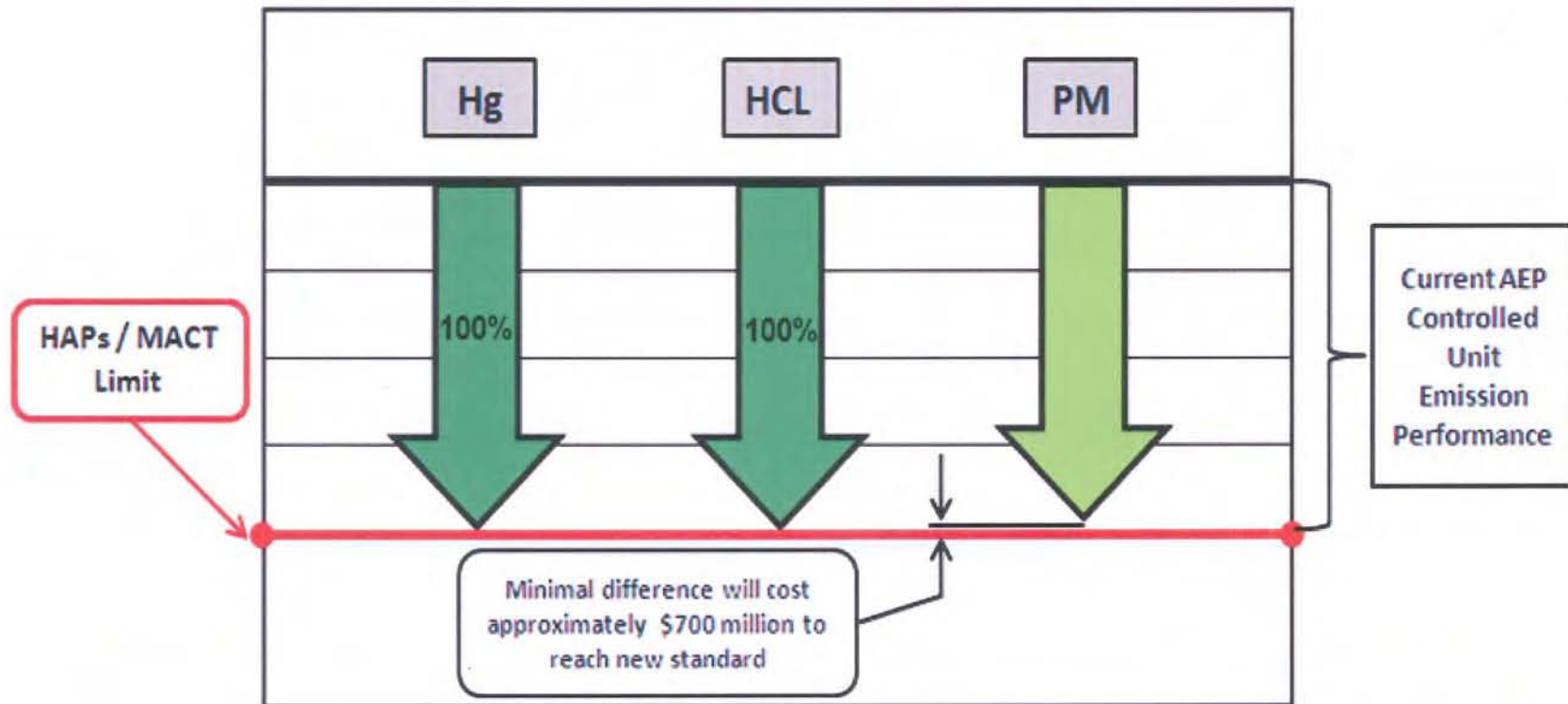
The benefits from DSI application have been greatly overstated

The Role of Renewables

- Renewables need to have a larger presence in Americas generation portfolio. However, aside from their capacity, most forms of renewable generation are not operationally suited as adequate replacements for grid support services provided by the coal units projected to retire as a result of the EPA rules

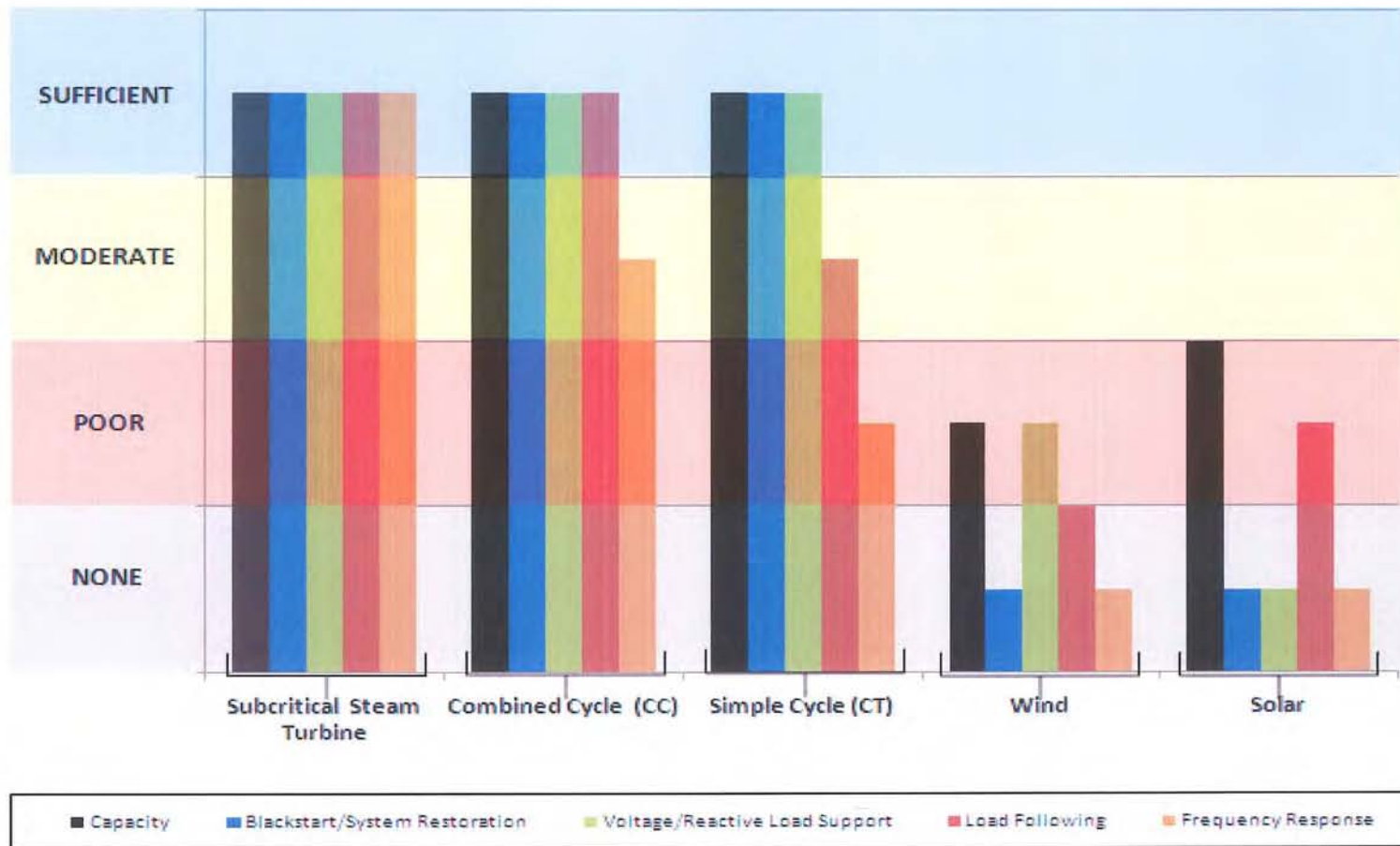
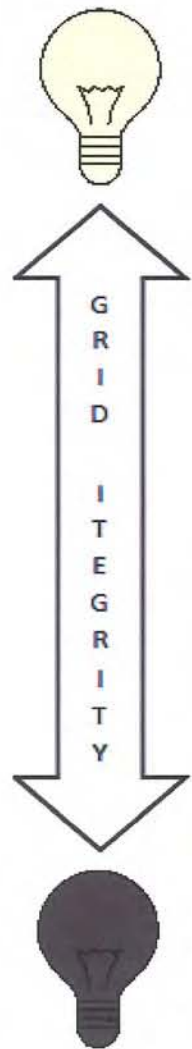
Note: Renewables such as wind and solar do not provide base load generation.....they are variable generation and therefore cannot be relied upon 24/7 to meet demand

Controlled Units Compliance Issue



AEP's best nine controlled units (9,000 MW), currently meet 100% of Hg and HCL emissions limits in the HAPs proposed rule. Equipment upgrades required to reach the PM limit will cost approximately \$700 MM million with only a fractional improvement. Our plan places these type of upgrades at the end of the project schedule due to this reality.

Generating Unit Support Capabilities to The Bulk Electric System



Notes: Wind operates at 13% capacity factor;
 Solar operates at a 30% capacity factor;
 Solar generation tends to follow typical day-time load peaks;
 Reaction time of gas turbine mechanics to control demands or grid frequency excursions are inferior to steam turbine governor response