

Permitting Coal Fired Power Plants for Greenhouse Gases and Hazardous Air Pollutants

July 14, 2009
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Permitting coal fired power plants is now highly controversial



- Increased public awareness and concern over climate change issues
- Coal fired power plants in the U.S. and abroad have been identified as significant contributors
- Mercury emissions from coal fired power plants are also of concern to the public
- Reversal of EPA's mercury delisting decision requires state issued MACT permits for new units under section 112(g)

Environmental Groups oppose any new coal plants



- “Global warming has a new battleground: coal plants”
- “Every time a new coal-fired power plant is proposed anywhere in the United States, a lawyer from the Sierra Club or an allied environmental group is assigned to stop it, by any bureaucratic or legal means necessary.”
- “Environmental lawyers make a concentrated effort to stop new ones from being built; a coalition claims 65 victories in the last year”. Los Angeles Times, April 14, 2008

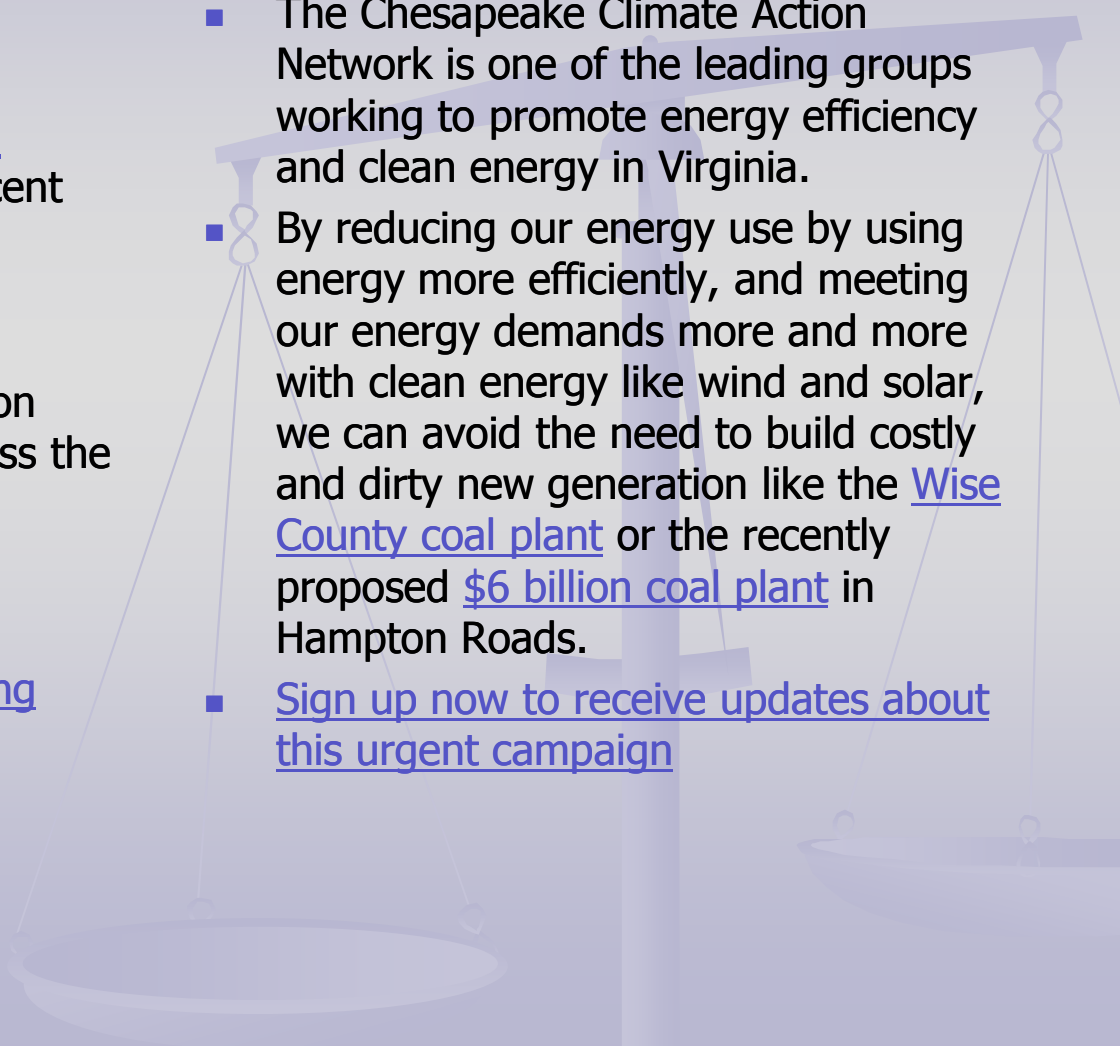
Environmental Groups oppose any new coal plants



A 250-megawatt IGCC power plant near Lakeland, Fla., constructed as part of the U.S. Department of Energy's Clean Coal Technology Program. *DOE photo.*

- Groups have even challenged permits for IGCC plants
- Effort is part of a strategy to force Congressional action on climate change legislation
- Bottom line: new permits will be subject to a far greater degree of scrutiny than ever before
- Easiest path to obstruct new permits: "failure to consider alternatives"

Environmental Groups oppose any new coal plants

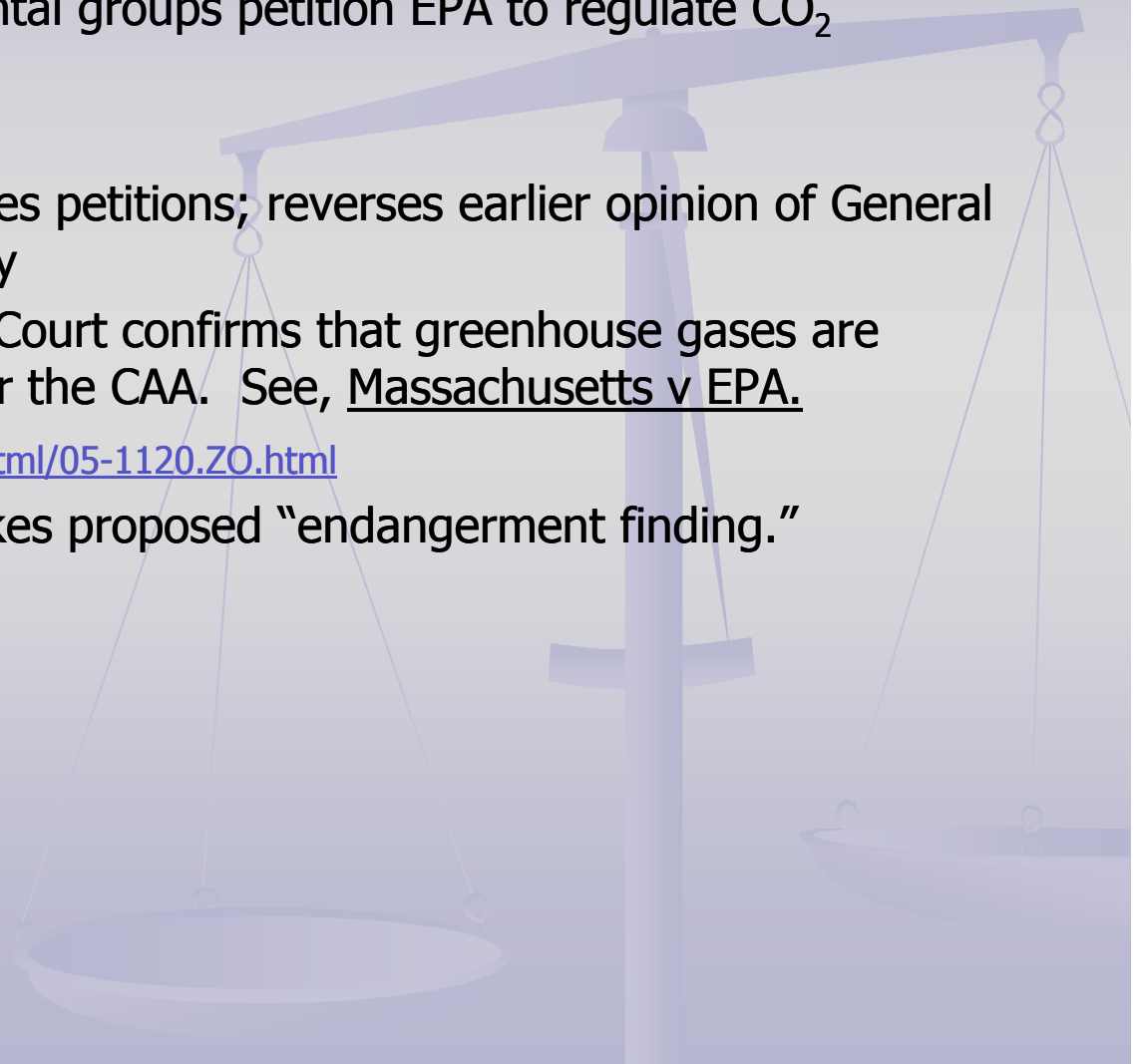
- **Beyond Coal**
 - **Find Your Local Coal Plants**
 - **[Stopping the Coal Rush Map](#)**
Learn more about current or recent coal plant challenges, get key resources, and more.
 - **[Coal Plant Tracker](#)**
Find up to date status information about proposed coal plants across the country.
 - [Coal Main](#)
 - [MTR Permit Tracker](#)
 - [Mountaintop Removal Coal Mining](#)
 - [The Dirty Truth About Coal](#)
 - [Liquid Coal](#)
 - [Factsheets and Resources](#)
- The Chesapeake Climate Action Network is one of the leading groups working to promote energy efficiency and clean energy in Virginia.
 - By reducing our energy use by using energy more efficiently, and meeting our energy demands more and more with clean energy like wind and solar, we can avoid the need to build costly and dirty new generation like the [Wise County coal plant](#) or the recently proposed [\\$6 billion coal plant](#) in Hampton Roads.
 - [Sign up now to receive updates about this urgent campaign](#)
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Federal law on direct regulation of greenhouse gases continues to evolve

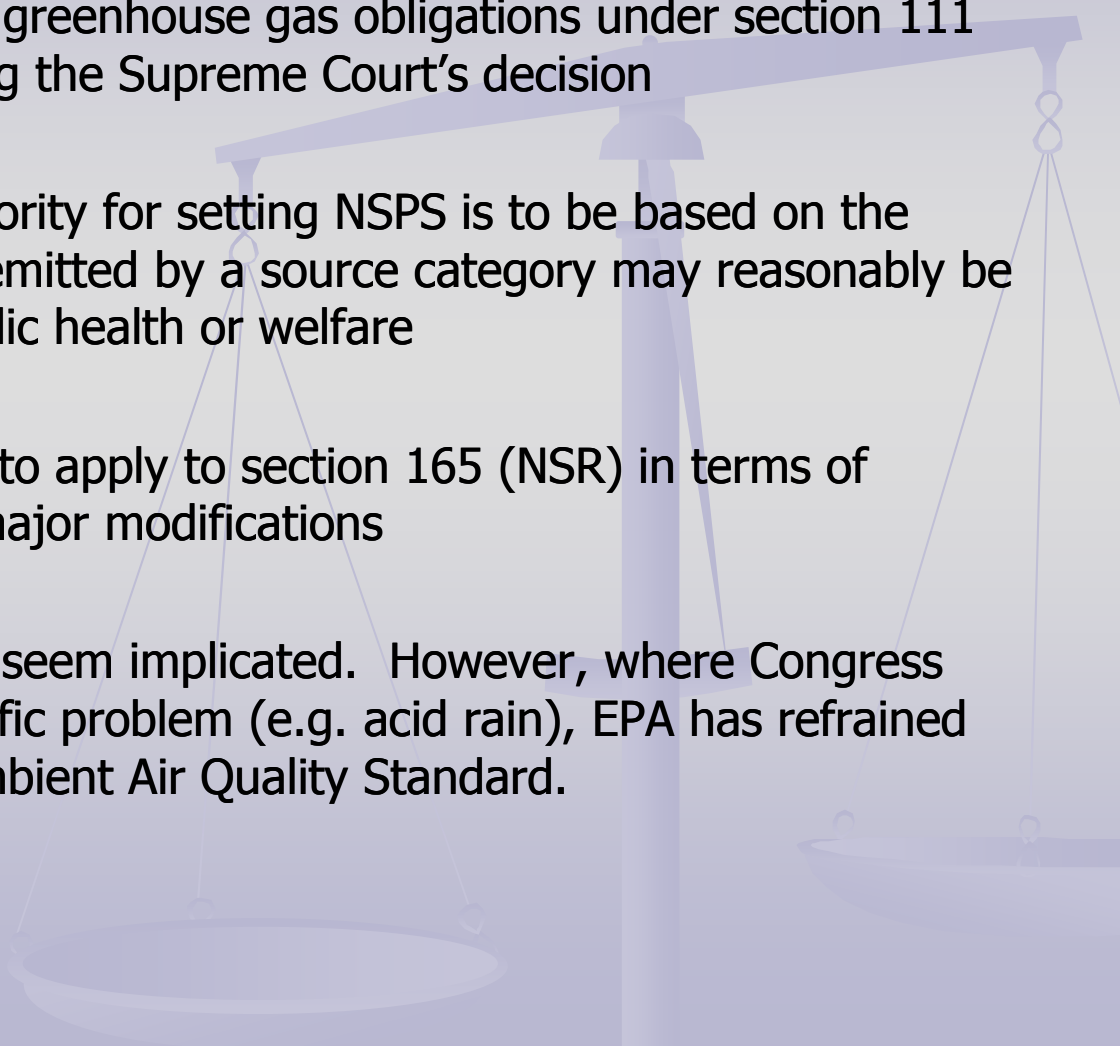
- In 1998, EPA provided Congress an opinion by the EPA General Counsel that concluded that EPA had authority regulate emissions of CO₂. See, http://lawprofessors.typepad.com/environmental_law/files/EPACO2memo1.pdf
- “SO₂, NO_x, CO₂, and mercury from electric power generation are each a ‘physical [and] chemical... substance which is emitted into . . . the ambient air,’ and hence, each is an air pollutant within the meaning of the Clean Air Act.”
- “‘Welfare’ includes, but is not limited to, effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and **climate**, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants.”

Federal law on direct regulation of greenhouse gases continues to evolve

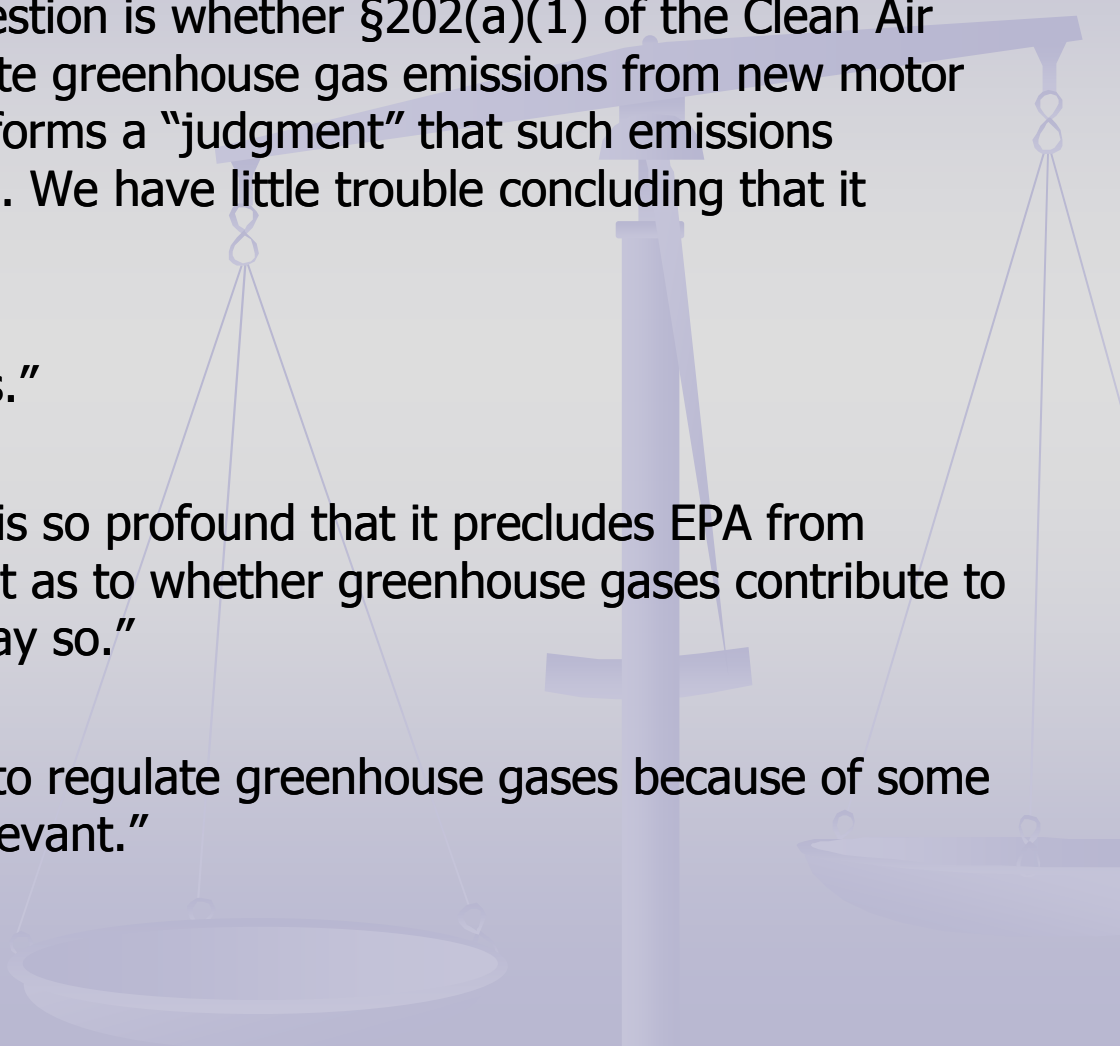
- October, 1999 – Environmental groups petition EPA to regulate CO₂ emissions from automobiles
- September 2003 – EPA denies petitions; reverses earlier opinion of General Counsel as to EPA's authority
- April, 2007 – U.S. Supreme Court confirms that greenhouse gases are "subject to regulation" under the CAA. See, Massachusetts v EPA.
<http://www.law.cornell.edu/supct/html/05-1120.ZO.html>
- March 20, 2009, USEPA makes proposed "endangerment finding."



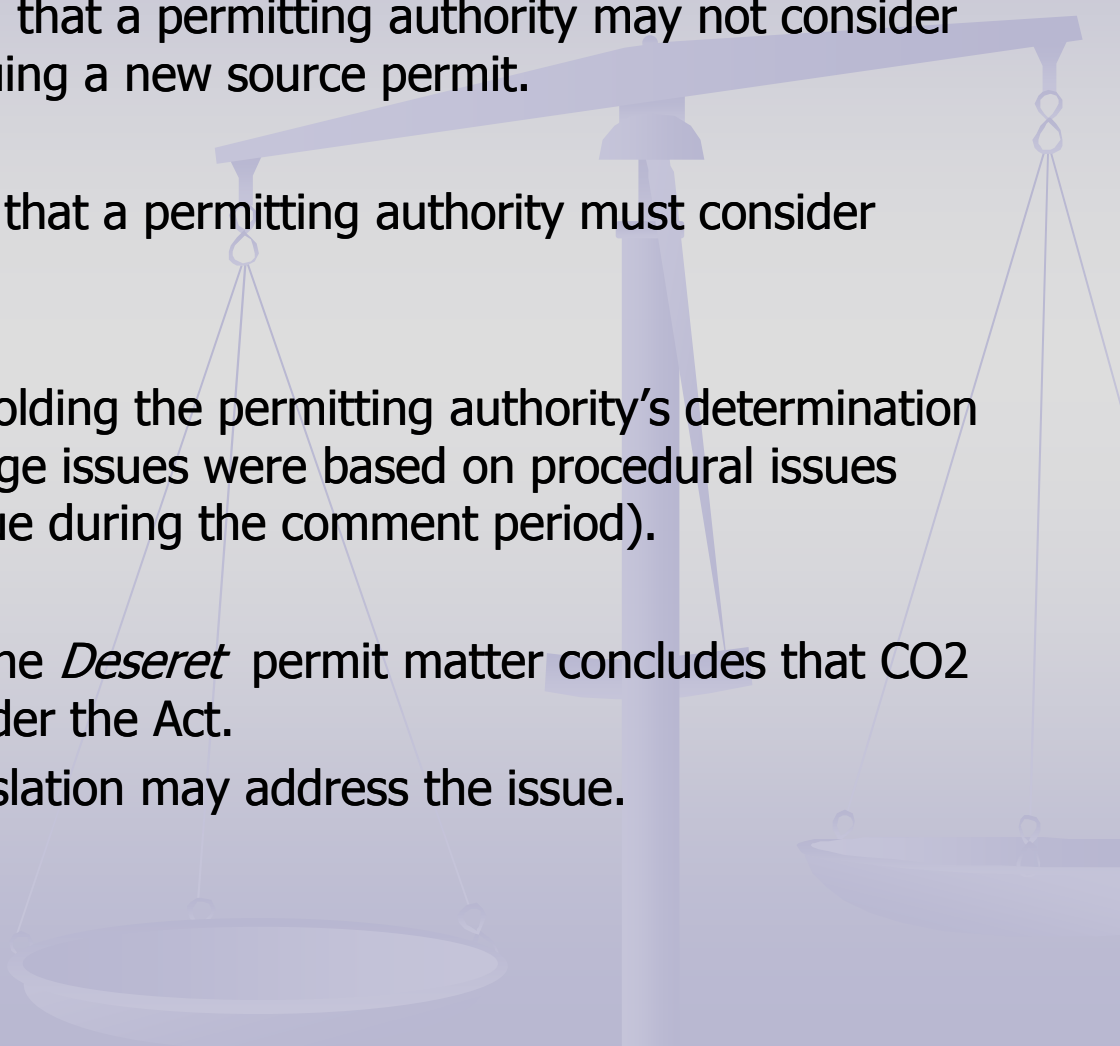
Federal law on direct regulation of greenhouse gases continues to evolve

- A second challenge to EPA's greenhouse gas obligations under section 111 (NSPS) was deferred pending the Supreme Court's decision
 - Under section 111, EPA's priority for setting NSPS is to be based on the extent to which a pollutant emitted by a source category may reasonably be anticipated to endanger public health or welfare
 - The same logic would seem to apply to section 165 (NSR) in terms of establishing thresholds for major modifications
 - Similarly, section 110 would seem implicated. However, where Congress has acted to address a specific problem (e.g. acid rain), EPA has refrained from adopting a National Ambient Air Quality Standard.
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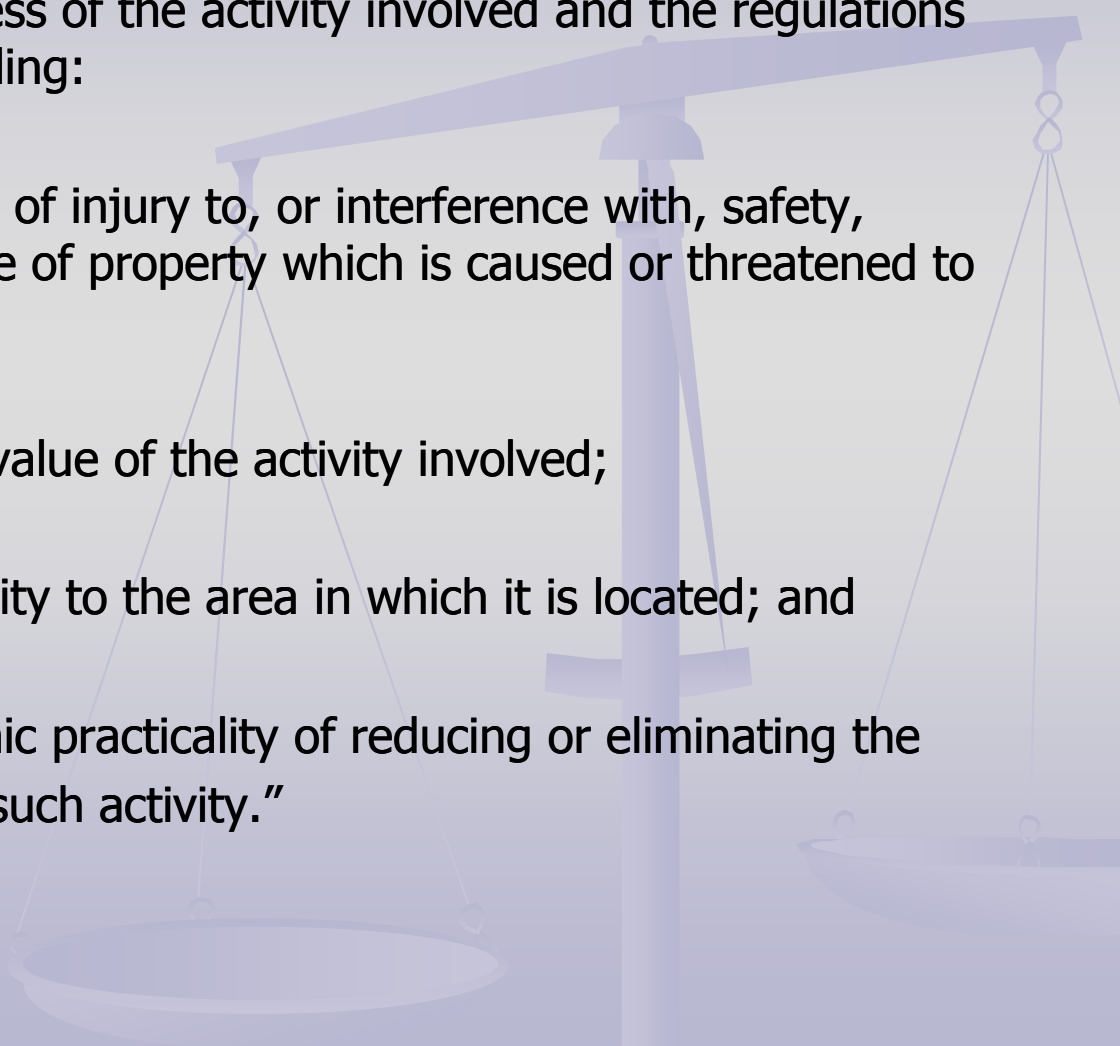
Federal law on direct regulation of greenhouse gases continues to evolve

- “On the merits, the first question is whether §202(a)(1) of the Clean Air Act authorizes EPA to regulate greenhouse gas emissions from new motor vehicles in the event that it forms a “judgment” that such emissions contribute to climate change. We have little trouble concluding that it does.”
 - “The statute is unambiguous.”
 - “If the scientific uncertainty is so profound that it precludes EPA from making a reasoned judgment as to whether greenhouse gases contribute to global warming, EPA must say so.”
 - “That EPA would prefer not to regulate greenhouse gases because of some residual uncertainty....is irrelevant.”
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May/must a permitting authority consider climate change in NSR permitting?

- Thus far, no court has ruled that a permitting authority may not consider climate change issues in issuing a new source permit.
 - Similarly, no court has ruled that a permitting authority must consider climate change issues.
 - Several of the decisions upholding the permitting authority's determination not to consider climate change issues were based on procedural issues (e.g., failure to raise the issue during the comment period).
 - The recent EAB decision in the *Deseret* permit matter concludes that CO2 is "subject to regulation" under the Act.
 - Pending climate change legislation may address the issue.
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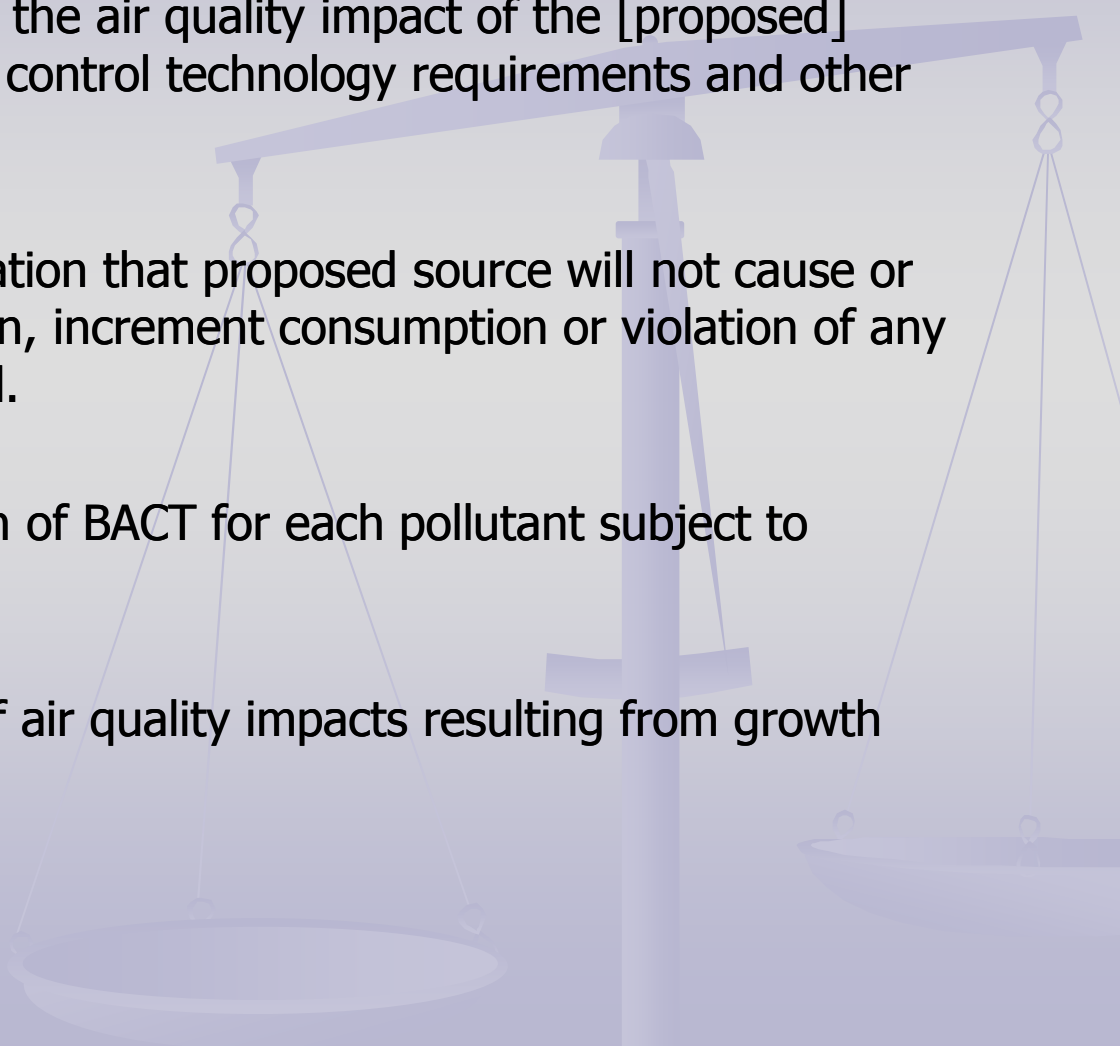
What does state law require to be considered?

- “The Board in...approving ... permits shall consider facts and circumstances relevant to the reasonableness of the activity involved and the regulations proposed to control it, including:
 - 1. The character and degree of injury to, or interference with, safety, health, or the reasonable use of property which is caused or threatened to be caused;
 - 2. The social and economic value of the activity involved;
 - 3. The suitability of the activity to the area in which it is located; and
 - 4. The scientific and economic practicality of reducing or eliminating the discharge resulting from such activity.”
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What does state law require to be considered?

- “Pollutant’ means any substance the presence of which in the outdoor atmosphere is or may be harmful or injurious to human health, welfare or safety, to animal or plant life, or to property, or which unreasonably interferes with the enjoyment by the people of life or property.”
- “Welfare’ means that language referring to effects on welfare includes, but is not limited to, effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility and **climate**, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.”
- Look to state administrative law to determine the standard of review of decision making – at the Federal level all that is required is (1) procedure be followed, (2) alternatives be considered, (3) the decision be lawful and (4) the decision has a rational basis.

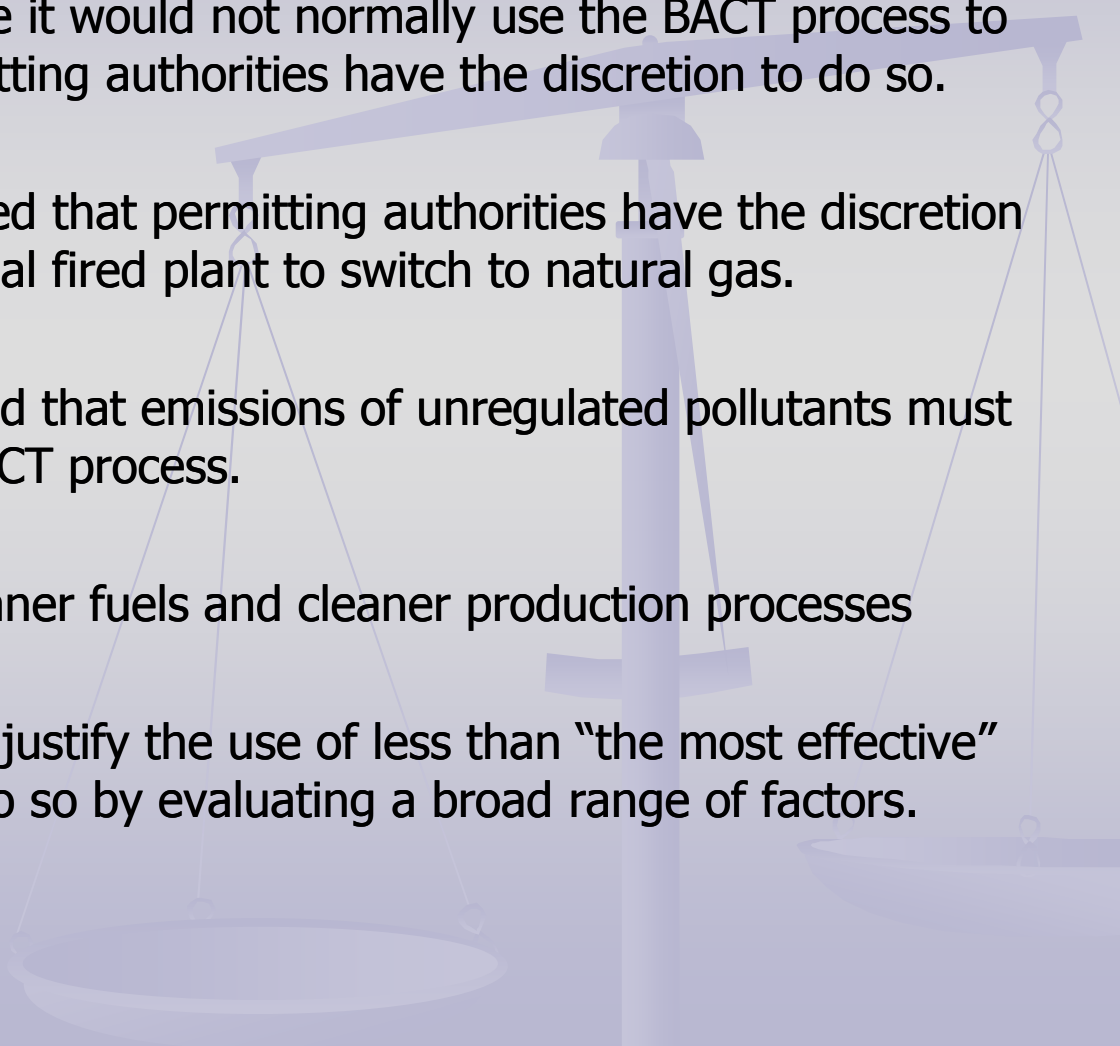
What does Federal law require to be considered?

- Section 165(a)(2) “review of the air quality impact of the [proposed] source, alternatives thereto, control technology requirements and other appropriate considerations.”
 - Section 165(a)(3) demonstration that proposed source will not cause or contribute to NAAQS violation, increment consumption or violation of any applicable emission standard.
 - Section 165(a)(4) application of BACT for each pollutant subject to regulation under the CAA.
 - Section 165(a)(6) analysis of air quality impacts resulting from growth associated with the facility.
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Section 165(a)(2) analysis

- Section 165(a)(2) analysis is separate from the BACT analysis and is not subject to EPA guidance regarding “redefining the source.”
- Instead, section 165(a)(2) requires permitting authorities to consider “alternatives” to the proposed source – including denial of the application.
- Consideration is based on the air quality impact of the proposed source, **alternatives thereto**, control technology requirements and **other appropriate considerations**.
- Thus, if it is reasonable to conclude that climate change is “an appropriate consideration” when permitting a new coal fired power plant, consideration of alternatives may not only be authorized, consideration may be required.

Section 165(a)(4) – BACT Analysis

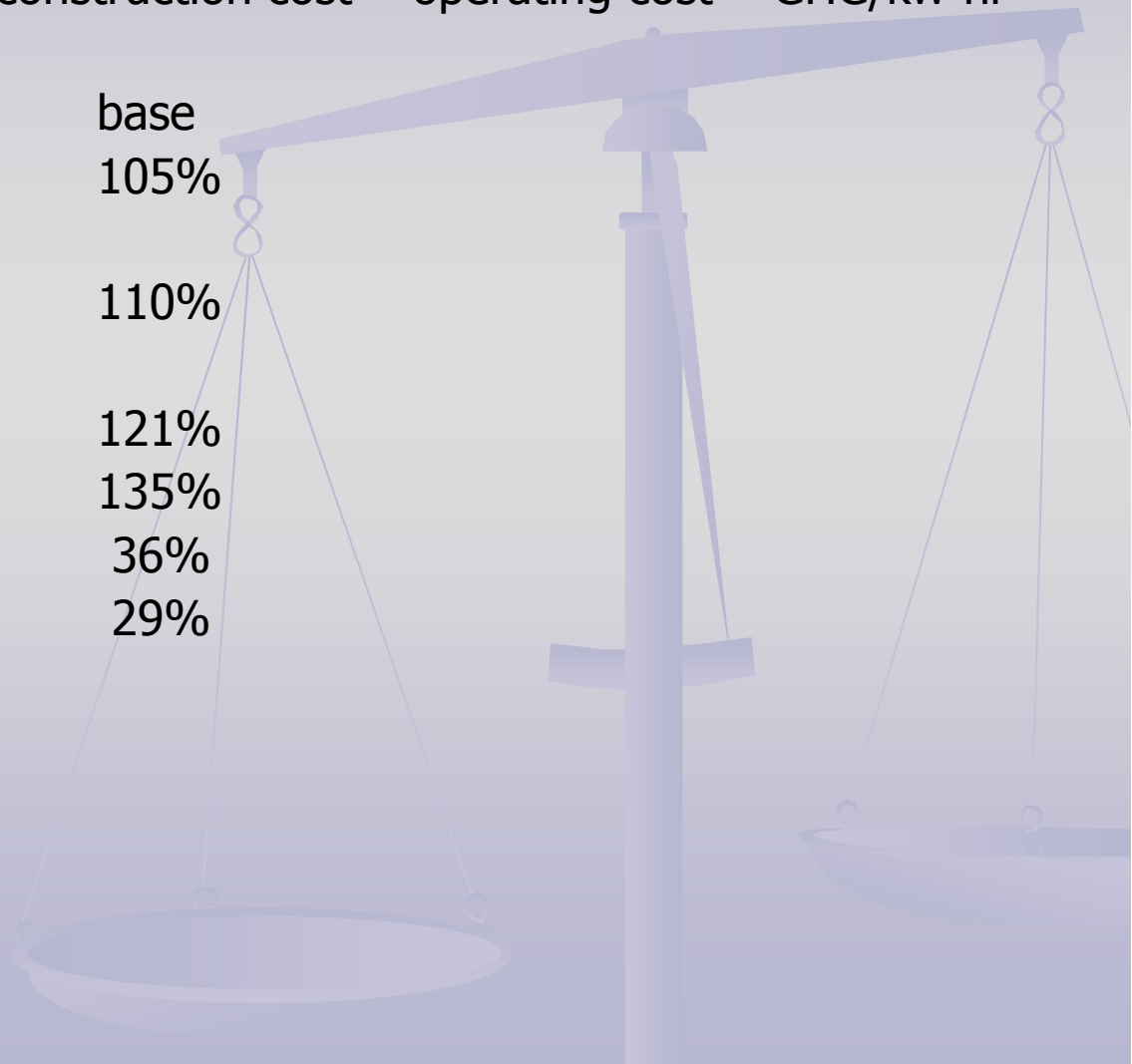
- EPA acknowledges that while it would not normally use the BACT process to “redefine” the source, permitting authorities have the discretion to do so.
 - At least one court has decided that permitting authorities have the discretion not to require a proposed coal fired plant to switch to natural gas.
 - Several EAB rulings have held that emissions of unregulated pollutants must be considered during the BACT process.
 - BACT expressly includes cleaner fuels and cleaner production processes
 - Where a source attempts to justify the use of less than “the most effective” control technology it must do so by evaluating a broad range of factors.
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Section 165(a)(4) – BACT Analysis

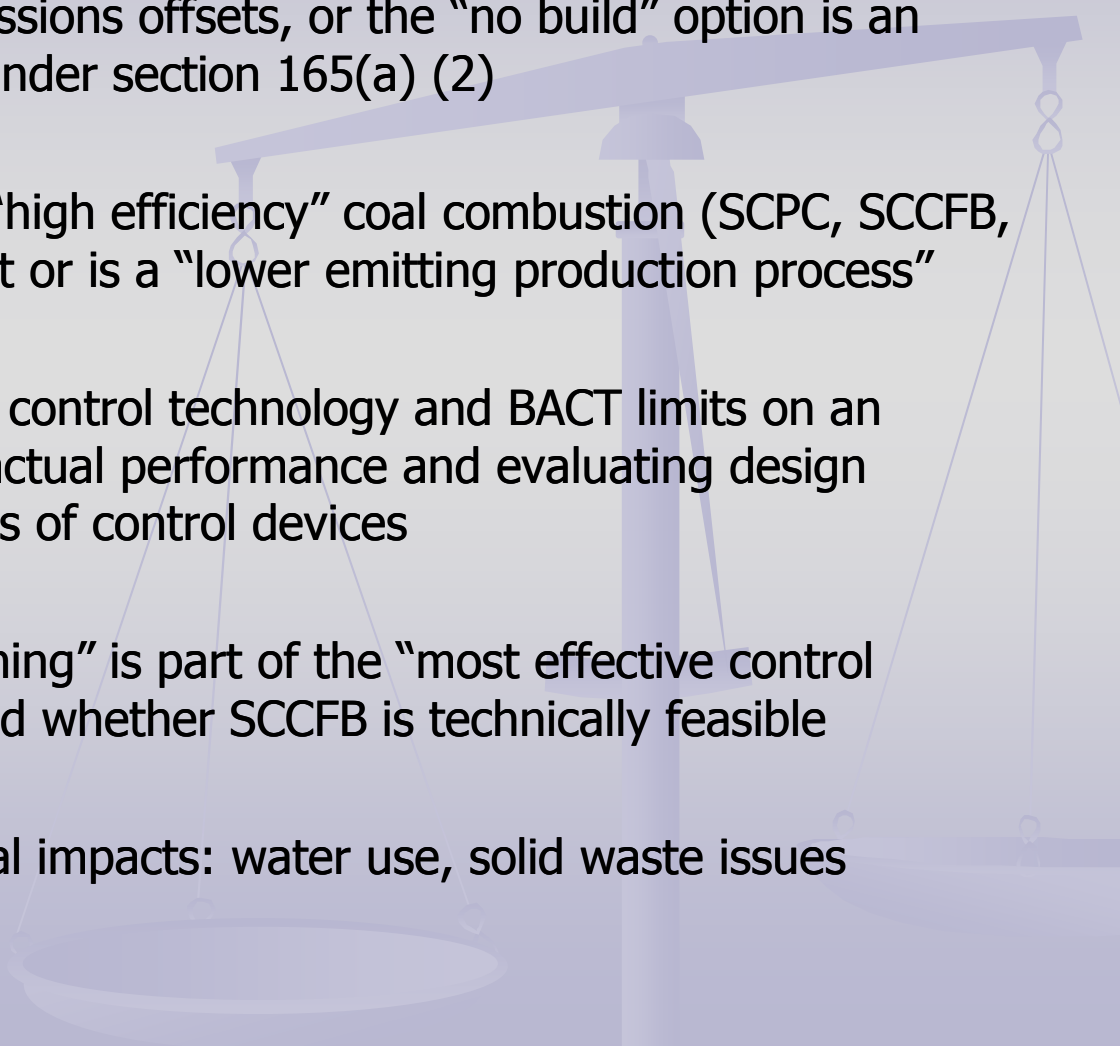
- “...taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant”
- “environmental impacts (includes any significant or unusual other media impacts (e.g., water or solid waste), and, at a minimum, the impact of each control alternative on emissions of toxic or hazardous air contaminants)”
- “energy impacts”
- “***Inherently Lower-Emitting Processes/Practices***, including the use of materials and production processes and work practices that prevent emissions and result in lower “production-specific” emissions”

Permitting Options – fill in the table

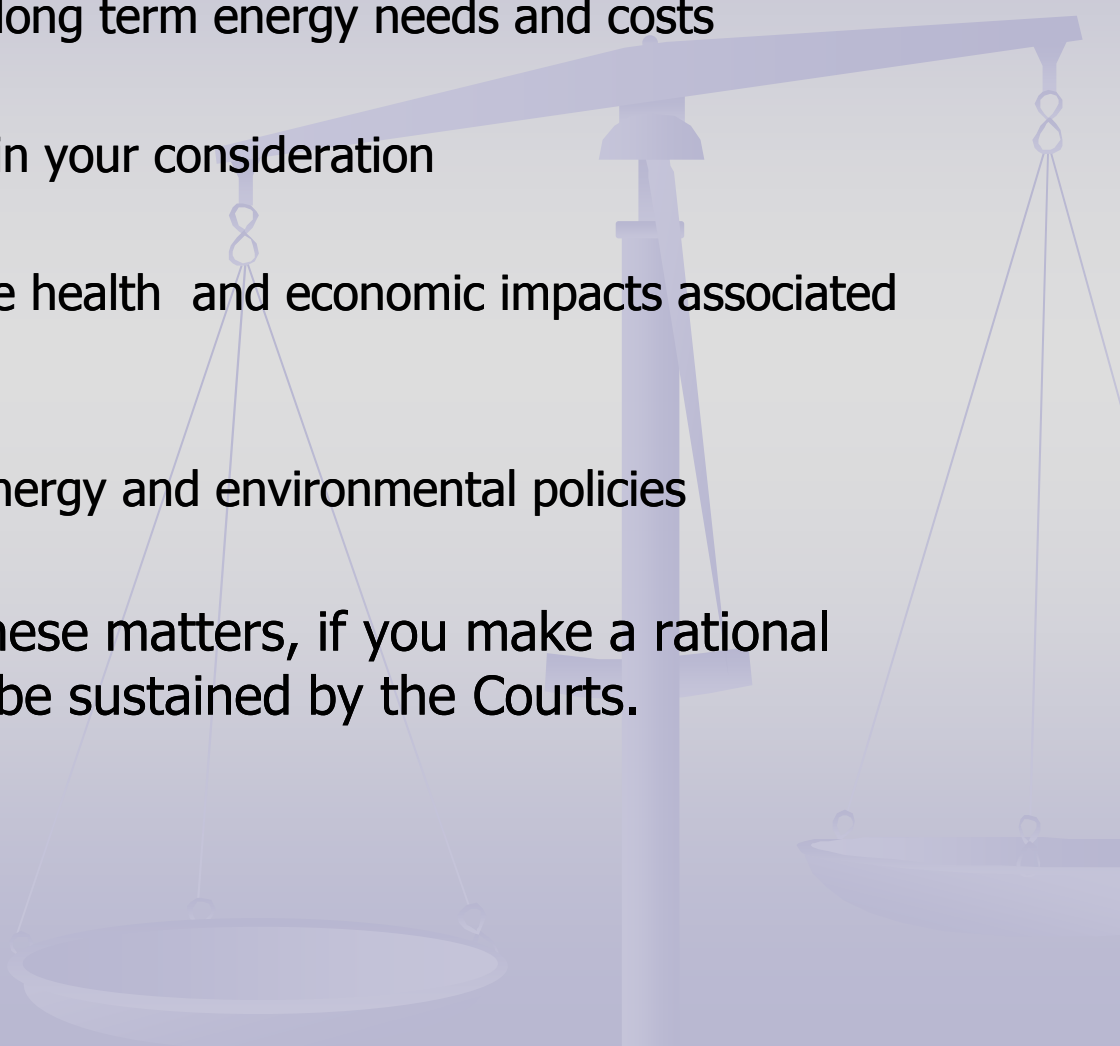
Technology	heat rate	construction cost	operating cost	GHG/kw-hr
PC	9,500	base		
SCPC	8,864	105%		
USCPC	8,000			
CFB	10,000	110%		
SCCFB	8,900 (est)			
IGCC	9,000	121%		
IGCC (prb)	10,800	135%		
Gas (CC)	7,200	36%		
Gas (CT)	10,500	29%		
"no build" offsets				



Permitting Options

- Consider whether IGCC, emissions offsets, or the “no build” option is an “alternative” to the project under section 165(a) (2)
 - Consider whether requiring “high efficiency” coal combustion (SCPC, SCCFB, IGCC) “redefines” the project or is a “lower emitting production process”
 - Identify the “most effective” control technology and BACT limits on an “output basis”, considering actual performance and evaluating design options within a general class of control devices
 - Consider whether “coal cleaning” is part of the “most effective control technology” for CFB units and whether SCCFB is technically feasible
 - Consider other environmental impacts: water use, solid waste issues
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Permitting Options

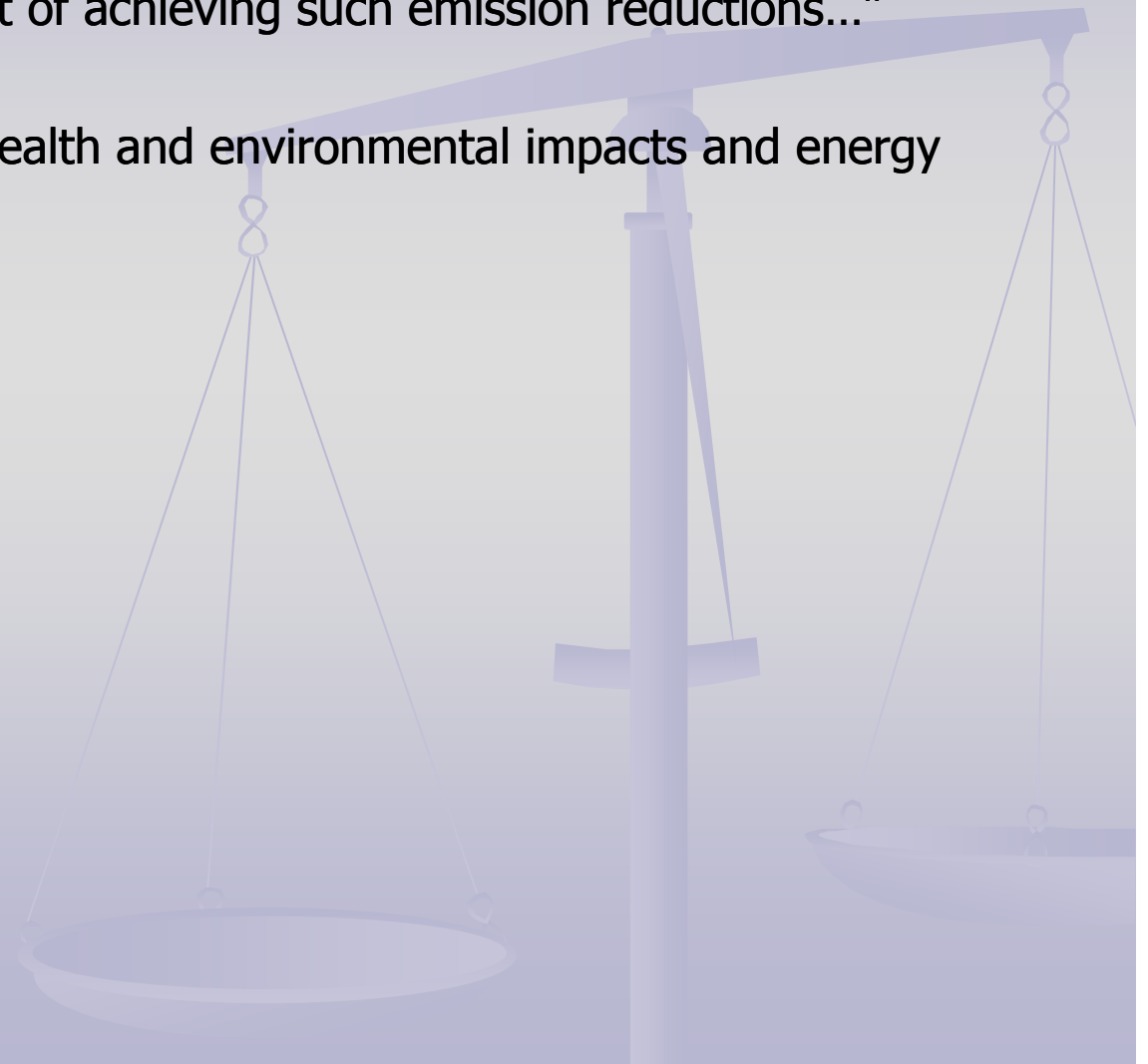
- Consider short, medium and long term energy needs and costs
 - Don't forget to include PM_{2.5} in your consideration
 - Consider potential for adverse health and economic impacts associated with electricity shortages
 - Consider Federal and state energy and environmental policies
 - Having considered all of these matters, if you make a rational decision, it will very likely be sustained by the Courts.
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But wait... there's more – 112(g) MACT permitting

- In February, 2008, the U.S. Court of Appeals invalidated EPA's reversal of its earlier finding under section 112(n) that regulation of emissions of toxic air pollutants from coal fired power plants was "necessary and appropriate"
- This decision, New Jersey v EPA, triggered the requirements of section 112(g) which requires authorities permitting new sources to determine on a case by case basis that MACT limitations will be met
- New source MACT is "... the emission limitation which is not less stringent than the best controlled similar source..."
- "... and which reflects the maximum degree of reduction in emissions of hazardous air emissions (including a prohibition on such emissions where achievable)"... that the [permitting authority] determines is achievable...

112(g) permitting

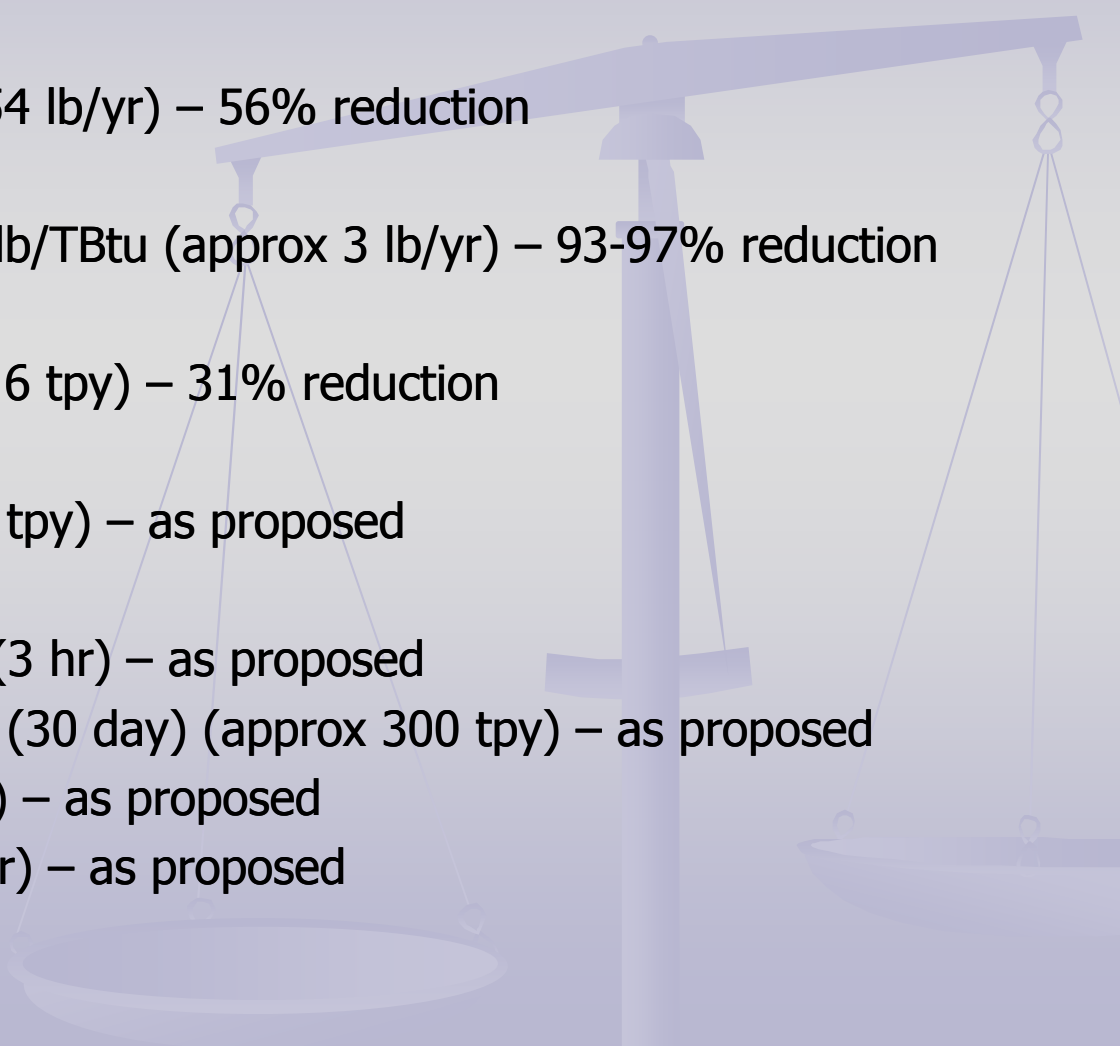
- “taking into account the cost of achieving such emission reductions...”
- “...and any non-air quality health and environmental impacts and energy requirements”



112(g) permitting

- $MACT = LAER^+ + BACT^+$
- The new source MACT “floor” is the emission performance achieved by the best “similar source” – without consideration of cost.
- The Courts have ruled that the MACT floor is based on the actual performance achieved in practice by the best performing sources.
- A “beyond the floor” analysis is required; compare cost and benefits of additional controls to cost of controls for the best performing sources; including other existing source (recommend use of Top Down approach).
- Based on prior EPA approaches to “surrogate” pollutants for HAPs consider setting limits for PM, CO, Hg, HF, and HCl.
- “Enhanced monitoring” is required.

Wise County MACT Permit

- CO – 0.10 lb/MMBtu (2,743 tpy) – 33% reduction
 - HCl - 0.0029 lb/MMBtu (79.54 lb/yr) – 56% reduction
 - Hg - 0.00000088lb/MW hr/9 lb/TBtu (approx 3 lb/yr) – 93-97% reduction
 - HF - 0.00047 lb/MMBtu (18.6 tpy) – 31% reduction
 - VOC – 0.005 lb/MMBtu (137 tpy) – as proposed
 - PM_{filterable} – 0.010 lb/MMBtu (3 hr) – as proposed
- 0.009 lb/MMBtu (30 day) (approx 300 tpy) – as proposed
 - PM₁₀ – 0.012 lb/MMBtu (3hr) – as proposed
 - PM_{2.5} – 0.012 lb/MMBtu (3 hr) – as proposed
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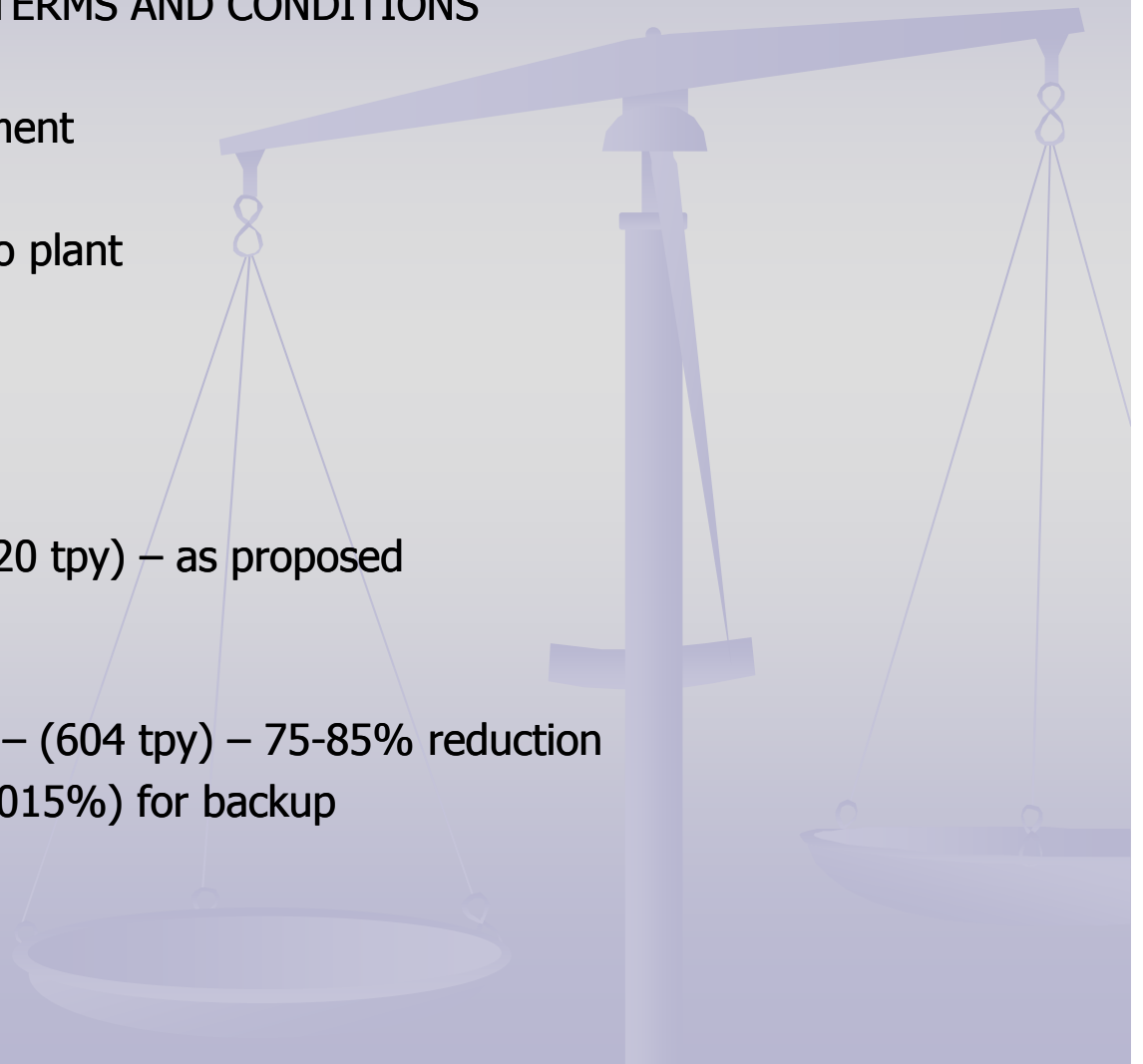
WISE COUNTY PSD PERMIT

ENVIRONMENTAL REVIEW BASED TERMS AND CONDITIONS

- Waste pile remediation requirement
- Minimum biomass requirement
- Natural gas conversion of Bremo plant

BACT REQUIREMENTS

- Co, PM, Hg as in MACT Permit
- NO_x - 0.07 lb/MMBtu (3 hr) (1920 tpy) – as proposed
- SO₂ – 0.035 lb/MMBtu (3 hr)
 - 0.029 lb/MMBtu (24 hr)
 - 0.022 lb/MMBtu (30 day) – (604 tpy) – 75-85% reduction
 - low sulfur diesel fuel (0.0015%) for backup



RESPONSE



APPLICANT:

- “Tough, but we can live with it.”
- Subsequently applied for additional lime storage capacity

ENVIRONMENTAL GROUPS:

Appalachian Voices, Chesapeake Climate Action Network, Sierra Club and Southern Appalachian Mountain Stewards v State Air Pollution Control Board, Case No. 08003530

MACT Permit Challenges

- Unlawful “escape hatch” for Hg limit
- Failure conduct proper “floor” and “beyond the floor” analysis
- Improper reliance on surrogates

Response (cont.)

PSD Permit Challenge

- Reliance on EPA PM_{2.5} NSR Guidance
- Failure to consider fuel cleaning and coal produced outside of Virginia
- Failure to establish BACT limits for CO₂

