WWW.NMCLIMATECHANGE.US

Energy Supply Technical Work Group

Draft "Group D" Straw Proposals
March 28, 2006

#	Policy Name	Long List#	Volunteer Group	Email Addresses
		A. Renewable Energy		
ES-1	Mandate(s) for Renewable Energy (RPS, etc.)	1.1	Burks, Griscom, Groenwold, Luce, Melton, O'Hare, [Sandia?]	jburks@pnm.com dgriscom@rdcnm.org kgroenewold@nmelectric.coop benluce@nmccae.org dmelton@sacredpowercorp.com craig.ohare@state.nm.us
ES-2	Financial Incentives for Distributed Renewables	1.2, ~1.4, 1.5, ~1.9, 5.2, ~5.3	Ely, Griscom, Hoodenpyle, Luce, Melton, Pilz, Ramakka, Singer (RCI), Smith	wpilz@pnm.com dgriscom@rdcnm.org agrienergy@hotmail.com benluce@nmccae.org dmelton@sacredpowercorp.com jim_ramakka@nm.blm.gov tsinger@nrdc.org smithgr1@bp.com
ES-3	Renewable energy transmission and storage	~1.9	Gregory, Ihle, Luce, Michel, O'Hare, [Sandia?]	sfgregory@spinn.net jack.ihle@xcelenergy.com benluce@nmccae.org stevensmichel@msn.com craig.ohare@state.nm.us
ES-4	Financial Incentives for Centralized Renewables	~(1.1, 1.2, 1.6)	Ely, Griscom, Hoodenpyle, Luce, Melton, Pilz, Ramakka, Singer (RCI), Smith	wpilz@pnm.com dgriscom@rdcnm.org agrienergy@hotmail.com benluce@nmccae.org dmelton@sacredpowercorp.com jim_ramakka@nm.blm.gov tsinger@nrdc.org smithgr1@bp.com
ES-5	R&D including Energy Storage	~(1.3, 1.9)	Guthrie, Michel, [Sandia?]	gguthrie@lanl.gov stevensmichel@msn.com

#	Policy Name	Long List#	Volunteer Group	Email Addresses
B. Centralized Non-Renewable Electricity				
ES-6	Advanced Coal/Fossil Technologies (e.g., IGCC with carbon capture)	2.1, 2.2	Burks, Ely, Groenewold/[Sub?], Ihle, Luce, O'Hare, Potturi, [Sandia? (Dave Borns)], Singer (RCI)	jburks@pnm.com sandra.ely@state.nm.us kgroenewold@nmelectric.coop jack.ihle@xcelenergy.com benluce@nmccae.org craig.ohare@state.nm.us prasad.potturi@state.nm.us tsinger@nrdc.org
ES-7	Nuclear Relicensing & Uprating	3.2	Groenewold, Kuswa, Michel, Miller	kgroenewold@nmelectric.coop gwkuswa@sandia.gov stevensmichel@msn.com amiller@pnm.com
C. Grid & Demand-Side Policies				
ES-8	Incentives and Barrier Reductions for Combined Heat & Power (CHP)	4.1, 5.2	Barnes, Brinker (RCI), Griscom Hoodenpyle,	rbarnes@americangypsum.com cbrinker@swenergy.org dgriscom@rdcnm.org agrienergy@hotmail.com
ES-9	Demand-Side Management, Energy Efficiency, and Integrated Resource Planning (IRP) (Broad demand management of electricity and natural gas, focused on consumption, not peaks) ***(Note: ES will leverage RCI's work on this option.)***	~(5.7, 5.9, 5.10) +	Burks, Gregory, Smith, Singer (RCI)	jburks@pnm.com sfgregory@spinn.net smithgr1@bp.com tsinger@nrdc.org
ES-10	Transmission capacity and corridors	~5.3	Ihle, Michel, Ramakka	jack.ihle@xcelenergy.com stevensmichel@msn.com jim_ramakka@nm.blm.gov

#	Policy Name	Long List#	Volunteer Group	Email Addresses
D. Oil & Gas Policies				
ES-11	CO2 Capture and Storage or Reuse (CCSR) in oil & gas and other operations; includes storage or reuse of power sector CO2 (see ES-6)	~(7.14, 2.2)	Ames, Ely, Epel, Fesmire, Gantner, Guthrie, Groenewold, Kuswa, Lee, Smith, Weaver, Zak	ames@westernlaw.org sandra.ely@state.nm.us jbepel@duke-energy.com mark.fesmire@state.nm.us bgantner@br-inc.com gguthrie@lanl.gov kgroenewold@nmelectric.coop gwkuswa@sandia.gov lee@nmt.edu smithgr1@bp.com lany.weaver@state.nm.us bdzak@sandia.gov
ES-12	Methane reduction in oil & gas operations – Best Management Practices (BMPs) & Partner Reduction Opportunities (PROs)	~(7.4, 7.5, & 7.9 - 7.14)	Ames, Epel, Fesmire, Gantner, Groenewold, Smith, Weaver	ames@westernlaw.org jbepel@duke-energy.com mark.fesmire@state.nm.us bgantner@br-inc.com kgroenewold@nmelectric.coop smithgr1@bp.com lany.weaver@state.nm.us
ES-13	CO2 reduction from fuel combustion in oil & gas operations	~(7.1, 7.2, 7.3)	Ames, Epel, Gantner, Ramakka, Smith, Weaver	ames@westernlaw.org jbepel@duke-energy.com bgantner@br-inc.com jim_ramakka@nm.blm.gov smithgr1@bp.com lany.weaver@state.nm.us
E. Emissions Policies				
ES-14	GHG Cap & Trade (includes offsets policies)	(11.4, 11.2)	Burks, Green, Groenewold, Ihle, Luce, Michel, O'Hare, Singer (RCI), Tavarez (RCI), Whaley (RCI)	jburks@pnm.com gsgwin@aol.com kgroenewold@nmelectric.coop jack.ihle@xcelenergy.com benluce@nmccae.org stevensmichel@msn.com craig.ohare@state.nm.us tsinger@nrdc.org itavarez@cabq.gov don@navajo-refining.com

ES-11: Carbon Capture and Storage or Reuse (CCSR)

1. Policy Description:

   a. Lay description of proposed policy action:

      Carbon capture and storage or reuse (CCSR) involves capturing carbon and either (1) sequestering it in a geologically sound reservoir or (2) reusing the carbon to aid in natural gas extraction or as a feedstock for industrial processes, and perhaps eventually as a feedstock that when combined with water can be reformed into liquid fuels. Carbon can and is captured in natural gas extraction; natural gas can have only up to 2.5% CO2, and some gas fields have a much higher concentration. Excess CO2 is removed and is currently typically vented to the atmosphere. Carbon can also be captured in the process of gasifying coal to liquid fuels. This process is well established in the chemical industry and forms the basis for Integrated Gasification Combined Cycle electricity generating plants. Potentially, carbon could also be captured directly from the atmosphere.

      Policies to encourage CCSR could include a state agency or department within an existing agency tasked with promoting CCSR, evaluation studies to identify geologically sound reservoirs, R&D funding to improve CCSR technologies, financial incentives to capture and store carbon or to capture and reuse it, and/or mandates to capture and store carbon or capture and reuse it.

   b. Policy Design Parameters:

      i. Implementation level(s) beyond BAU:

         Create a department within an existing state agency to encourage the use of CCSR. The department would provide technical resources including an evaluation of sites suitable for storing carbon and would administer financial incentives for CCSR. Financial incentives would include guaranteeing financing for CCSR projects and ___ tax exemptions for up to ___ years.

         The volunteer group suggested that we look separately at CCSR from power plants and the oil and gas industry. The group suggested focusing on acid gas reinjection for the oil and gas industry, and said that there would need to be pipelines to transport carbon from powerplants. The group also indicated that policies should be incentives rather than mandates. The volunteer group did not offer any specific recommendations for quantification.

      ii. Timing of implementation:

See above.

iii. Implementing parties:

iv. Other

c. Implementation Mechanism(s): Indicate which mechanisms are to be used, and describe the specific approach that is proposed

   i. Funding mechanisms and or incentives

   ii. Pilots and demos

   iii. Research and development

2. BAU Policies/Programs, if applicable:

   a. No policies are in place in New Mexico to encourage the use of CCSR.

   b.

3. Types(s) of GHG Benefit(s):

   a. CO2: If carbon is successfully stored in appropriate geological reservoirs, the net emission of carbon is effectively zero. If carbon is reused to make liquid fuels, then when those fuels are combusted, there would be carbon emissions at a rate comparable to natural gas.

   b. CH4

   c. N2O

   d. HFC's, SFC's

   e. Black Carbon: To the extent that coal is gasified rather than combusted directly (as in the case of IGCC), black carbon emissions from the coal that would otherwise be combusted will be reduced or eliminated.

4. Types of Ancillary Benefits and or Costs, if applicable:

   a. Implementing CCSR technology could lead to economic development within New Mexico, especially if New Mexico becomes a leader in these technologies and could export this expertise to other states and countries.

   b. Reusing carbon by reforming it into liquid fuels may provide New Mexico with an alternative industry to natural gas extraction as gas fields are depleted.

   c. During the process of gasification, many of the criteria air pollutants that would have resulted from direct combustion of coal can be eliminated, lowering health impacts and associated health costs.

d. Storing carbon in geological reservoirs carries with it a risk that the carbon would eventually leak out. If this happens, carbon storage would serve only to delay carbon emissions. There is also a risk, though perhaps small, of a sudden release of carbon from reservoirs. If near populated areas, a sudden substantial release could be dangerous.

5. Estimated GHG Savings and Costs Per MMTCO2e:
   a. Summary Table of:
      i. GHG potential in 2010, 2020, 2050
      ii. Net Cost per $MMTCO_2e$ in 2010, 2020, 2050
   b. Insert Excel Worksheet showing summary GHG reduction potential and net cost

6. Data Sources, Methods and Assumptions:
   a. Data Sources
   b. Quantification Methods
   c. Key Assumptions

7. Key Uncertainties if applicable:
   a. Benefits
   b. Costs

8. Description of Ancillary Benefits and Costs, if applicable:
   a. Description of issue #1
   b. Description of issue #2
   c. Etc.

9. Description of Feasibility Issues, if applicable:
   a. Description of issue #1
   b. Description of issue #2
   c. Etc.

10. Status of Group Approval:
   a. Pending
   b. Completed

11. <u>Level of Group Support:</u>
    a. Unanimous Consent
    b. Supermajority
    c. Majority
    d. Minority

12. <u>Barriers to consensus, if applicable (less than unanimous consent):</u>
    a. Description of barrier #1
    b. Description of barrier #2
    c. Etc.

ES-12: Methane Reduction in Oil & Gas Operations

1. Policy Description:

   a. Lay description of proposed policy action:

      There are a number of ways in which methane emissions in the oil and gas industry can be reduced, including:

      Preventive maintenance: Reduces emissions by improving the overall efficiency of the gas production and distribution system; minimizes the chance of leaks.

      Collection and re-injection or storage of flared gas: Rather than flaring gas, gas can be collected and re-injected or stored for productive use.

      Reduce flashing losses: As the pressure on the liquid natural gas in a storage tank, well, compressor station, or gas plant drops, some of the lighter compounds dissolved in the liquid are released or "flashed." Some of the compounds that are liquids at the initial pressure/temperature transform from a liquid into a gas/vapor and are also released or "flashed" from the liquid. The flashed gas can be captured rather than vented to the atmosphere.

      Replace wet seals with dry seals: Dry seals lead to fewer leaks than wet seals. Dry seals use high-pressure gas to seal the compressor and emit less methane, have lower power requirements, improve compressor and pipeline operating efficiency and performance, enhance compressor reliability, and require significantly less maintenance.

      Compressor rod & ring replacement: Replacing worn compressor rod packing rings and rods results in operational benefits, reduced methane emissions, and cost savings. Gas leaks from compressor rods represent one of the largest sources of emissions at natural gas compressor stations.

      Low-bleed, air-based pneumatic devices: Replacing high-bleed devices with low-bleed devices, retrofitting, and improving the maintenance of high-bleed pneumatic devices are proven approaches to profitably reducing methane emissions. Natural gas emissions from pneumatic control devices are one of the largest sources of methane emissions in the natural gas industry.

      Pump-down techniques prior to maintenance: Using fixed and portable compressors to lower pipeline pressure prior to maintenance and repair significantly reduces methane emissions and saves money. Pipeline pump-down techniques remove product from the section of pipeline under repair, thereby reducing the volume of natural gas vented to the atmosphere.

Venting deliquification: Venting deliquification occurs when natural gas is decompressed from liquid to gas. Some gas escapes to the atmosphere.

Coalbed methane capture: Capture and combustion or storage of coalbed methane from coal mines that would otherwise be vented to the atmosphere.

Reduce venting in the field:

San Juan Vistas:

Green Completions:

Natural Gas Star:

Policies to encourage these practices include education/information exchange, financial incentives, and mandates or standards that require certain practices.

b. Policy Design Parameters:

i. Implementation level(s) beyond BAU:

New Mexico establishes a process to evaluate methane reduction measures in the oil and gas industry, and companies that produce at least __ of natural gas must implement all practices that result in methane emission reductions with a cost below __$ per ton CO2 equivalent. New Mexico will provide technical assistance, as well as a convenient means for information exchange, to help companies implement these practices. New Mexico will also offer sales tax exemptions on any new equipment purchased to meet the requirement, as well as corporate tax credits of __% (or $__) to companies that are in compliance.

The volunteer group suggested that we go ahead as an analytical framework to use a $/ton basis for classifying methane reduction options, but insisted that policy approaches remain open. The volunteer group expressed that policies should be incentive-based and not mandatory. The group offered 5 – 10% improvement in capturing vented methane by 2012 as a reasonable target that could be achieved through incentives. The group suggested that by 2050, it may be possible to capture 90% to 95% of vented methane.

ii. Timing of implementation:

The process will conclude by 20__, and companies must be in compliance by 20__. Every __ years, a new process will be established to review new practices and costs and will set a new dollar per ton CO2 equivalent threshold.

iii. Implementing parties: Oil and gas producers, processors and transporters

    iv. Other

c. Implementation Mechanism(s): Indicate which mechanisms are to be used, and describe the specific approach that is proposed

    i. Information and education
    ii. Technical assistance
    iii. Funding mechanisms and or incentives
    iv. Voluntary and or negotiated agreements
    v. Codes and standards
    vi. Market based mechanisms
    vii. Pilots and demos
    viii. Research and development
    ix. Reporting
    x. Registry
    xi. Other?

2. <u>BAU Policies/Programs, if applicable:</u>

    a. Some companies practice the measures outlined above, but there is no requirement that all companies do all practices that result in emission reductions below a certain cost per ton.

3. <u>Types(s) of GHG Benefit(s):</u>

    a. CO_2:
    b. CH_4: This policy could result in significant reductions of methane emissions in the Oil and Gas industry.
    c. N_2O
    d. HFC's, SFC's
    e. Black Carbon:

4. <u>Types of Ancillary Benefits and or Costs, if applicable:</u>

    a. More natural gas would be available to consume in New Mexico or to export.
    b.

5. <u>Estimated GHG Savings and Costs Per $MMTCO_2e$:</u>

   a. Summary Table of:
      i. GHG potential in 2012, 2020, 2050
      ii. Net Cost per MMTCO2e in 2012, 2020, 2050
   b. Insert Excel Worksheet showing summary GHG reduction potential and net cost

6. Data Sources, Methods and Assumptions:
   a. Data Sources
   b. Quantification Methods
   c. Key Assumptions

7. Key Uncertainties if applicable:
   a. Benefits
   b. Costs

8. Description of Ancillary Benefits and Costs, if applicable:
   a. Description of issue #1
   b. Description of issue #2
   c. Etc.

9. Description of Feasibility Issues, if applicable:
   a. Description of issue #1
   b. Description of issue #2
   c. Etc.

10. Status of Group Approval:
    a. Pending
    b. Completed

11. Level of Group Support:
    a. Unanimous Consent
    b. Supermajority
    c. Majority
    d. Minority

12. Barriers to consensus, if applicable (less than unanimous consent):

    a. Description of barrier #1

    b. Description of barrier #2

    c. Etc.

ES-13: CO2 Reduction from Fuel Combustion in Oil and Gas Operations

1. Policy Description:

   a. Lay description of proposed policy action:

      There are a number of ways in which CO_2 emissions in the oil and gas industry can be reduced, including (1) new efficient compressors, (2) optimize gas flow to improve compressor efficiency, (3) improve performance of compressor cylinder ends, (4) capture compressor waste heat, and (5) replace compressor driver engines (6) waste heat recovery boilers.

      Policies to encourage these practices include education/information exchange, financial incentives, and mandates or standards that require certain practices.

   b. Policy Design Parameters:

      i. Implementation level(s) beyond BAU:

         New Mexico establishes process to evaluate CO_2 reduction measures in the oil and gas industry, and companies that produce at least __ of natural gas must implement all practices that result in CO_2 emission reductions with a cost below __$ per ton CO_2 equivalent. New Mexico will provide technical assistance, as well as a convenient means for information exchange, to help companies implement these practices. New Mexico will also offer sales tax exemptions on any new equipment purchased to meet the requirement, as well as corporate tax credits of ___% (or $___) to companies to comply.

         The group suggested that the focus of this policy should be incentives to improve the efficiency of compressors, including deployment of CHP systems that could sell excess power back to the grid, as well as electrically powered compressors.

      ii. Timing of implementation:

         The process will conclude by 20___, and companies must be in compliance by 20___. Every ___ years, a new process will be established to review new practices and costs and will set a new dollar-per-ton CO_2 equivalent threshold.

      iii. Implementing parties: Oil and gas producers, processors and transporters.

      iv. Other

c. Implementation Mechanism(s): Indicate which mechanisms are to be used, and describe the specific approach that is proposed

i. Information and education
ii. Technical assistance
iii. Funding mechanisms and or incentives
iv. Voluntary and or negotiated agreements
v. Codes and standards
vi. Market based mechanisms
vii. Pilots and demos
viii. Research and development
ix. Reporting
x. Registry
xi. Other?

2. <u>BAU Policies/Programs, if applicable:</u>

a. Some companies practice the measures outlined above, but there is no requirement that all companies do all practices that result in emission reductions below a certain cost per ton.

3. <u>Types(s) of GHG Benefit(s):</u>

a. CO_2: CO_2 emissions would be reduced directly by implementing these measures.
b. CH_4:
c. N_2O
d. HFC's, SFC's
e. Black Carbon: There are no expected black carbon reductions from these measures.

4. <u>Types of Ancillary Benefits and or Costs, if applicable:</u>

a. More natural gas would be available to consume in New Mexico or to export.
b.

5. <u>Estimated GHG Savings and Costs Per MMTCO2e:</u>

a. Summary Table of:

   i. GHG potential in 2012, 2020, 2050
   ii. Net Cost per MMTCO2e in 2012, 2020, 2050
  b. Insert Excel Worksheet showing summary GHG reduction potential and net cost

6. Data Sources, Methods and Assumptions:
   a. Data Sources
   b. Quantification Methods
   c. Key Assumptions

7. Key Uncertainties if applicable:
   a. Benefits
   b. Costs

8. Description of Ancillary Benefits and Costs, if applicable:
   a. Description of issue #1
   b. Description of issue #2
   c. Etc.

9. Description of Feasibility Issues, if applicable:
   a. Description of issue #1
   b. Description of issue #2
   c. Etc.

10. Status of Group Approval:
   a. Pending
   b. Completed

11. Level of Group Support:
   a. Unanimous Consent
   b. Supermajority
   c. Majority
   d. Minority

12. Barriers to consensus, if applicable (less than unanimous consent):
    a. Description of barrier #1
    b. Description of barrier #2
    c. Etc.