

NATIONAL WIND COORDINATING COMMITTEE

AIR QUALITY AND WIND ENERGY: ISSUES AND OPPORTUNITIES

Issue Forum
October 20, 2005 • Lansing, MI

Summary

On October 20, 2005, the National Wind Coordinating Committee hosted an issue forum to explore the relationship between wind energy and air quality, examining ways for wind power to help achieve air quality goals in Michigan and across the country. This issue forum offered the perspectives of three speakers: Alden Hathaway from Environmental Resources Trust, Ann Elsen from Montgomery County Department of Environmental Protection, and Steve Clemmer from the Union of Concerned Scientists. Their presentations catalyzed discussion on renewable energy credits and their role in achieving compliance under the Clean Air Act.

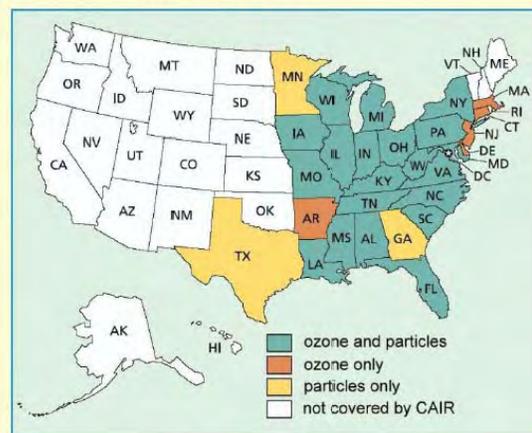
Alden Hathaway – The Relationship Between Air Quality and Wind Energy

The framework of the Clean Air Act requires all municipalities to submit regional air quality plans (State Implementation Plans or SIPs). SIPs address the emissions of ozone and particulates and their effect on air quality. Mr. Hathaway described the Clean Air Act's role as a market driver for renewable energy, especially wind.

State and local governments can choose from a range of air pollution control measures, such as HOV lanes and natural gas buses; however, these measures have largely been exhausted, so states and municipalities are looking into other approaches like wind power. There is a large marketing window of opportunity for wind in the next two years, due to regional air quality plans within the Clean Air Act that call for states in the Midwest and East to meet an 8-hour ozone standard.

Governments are anticipated to look towards wind to meet SIP requirements and help improve local air quality. Wind serves as a potential emissions control measure for municipalities because it generates emission reduction credits (ERCs) when fossil-fired plants are backed down. Currently, through state implemented cap and trade programs, the utility will receive the benefit of the ERC and can sell it to another energy generator who is failing to meet their required emission reduction. This trading mechanism allows for flexibility in emission reductions while still achieving the overall cap reduction in the area.

Clean Air Interstate Rule



(Source: Alden Hathaway, Environmental Resources Trust)

In order to give the ERC value to the renewable energy generator, the Michigan Air Quality Division is proposing a set-aside for renewable energy under the Clean Air Interstate Rule (CAIR). CAIR permanently caps emissions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) in the eastern U.S.

Under CAIR, NOx credits can be traded among states and the regional cap on emissions can still be met.

A municipality can also purchase ERCs from wind generators and use the credit to meet SIP requirements by retiring the credit, or sell it to raise additional revenue. Retiring an emission credit will bring down the emissions cap, thereby reducing the total amount of emissions that are allowed in that state and helping to improve air quality.

Mr. Hathaway expressed that state and local governments are the key market for wind power because their involvement and interest will increase market demand for wind power development. The government interest will lead to increased financing for wind farms and the farms will remain viable with municipalities and states serving as “anchor” customers to maintain the necessary demand.

NREL has developed a model SIP document for wind purchases which can be viewed at <http://www.eere.energy.gov/windandhydro/windpoweringamerica/sips.asp>.

Recommended Methods To Increase Cost-effectiveness of Wind Purchases:
<ul style="list-style-type: none"> ▪ Bundle with energy efficiency and innovative financing approaches; ▪ Blend with landfill gas & other lower-priced renewable energy

Ann Elsen – Implementing Wind Energy as Compliance Strategy

Wind power purchases are one option for improving air quality and compliance with the Clean Air Act (SIP requirements). The Clean Air Act serves as a market driver for wind power at the municipal level. For Montgomery County, Maryland, the SIP process made the purchase of wind energy economically viable. Montgomery County entered into a two year contract to purchase wind power and as one of the first municipalities to do so, serves as a model

for other areas interested in purchasing wind to improve air quality and achieve SIP requirements.

For Montgomery County, of all the methods the county could employ to achieve NOx emission reduction, including natural gas refueling stations, natural gas buses and bike lockers for commuters, wind energy proved by far the most cost-effective form.

Cost Effective NOx Reduction	
Control Measure	Cost (ton/year)
Wind Energy	\$32,000
CNG Refueling Stations	\$54,701
55 CNG Busses	\$103,063
1967 Bike Lockers	\$247,111

(Source: Ann Elsen, Montgomery County Dept. of Environmental Protection)

There are three options for purchasing wind power--buying a Renewable Energy Certificate (REC), a price hedge, or buying the power directly. The price hedge involves negotiating a strike price based on where the energy market is heading and requires a long period of time to become economically viable. Buying wind power directly is more difficult because wind is intermittent and RECs are required for SIP compliance to show that an offset is occurring. This option also requires a contract term of 20 years or greater to be economically viable. Montgomery County decided to incorporate wind power into their energy portfolio by purchasing RECs.

For purchasing RECs, a price premium is established and then the cost of the wind is determined by the size of the purchase and the length of the contract. Montgomery County benefited in this regard by bringing together buyers from small municipalities into one large buying group with a greater purchasing power. There was a two stage

procurement process to purchase the RECs which required pre-qualification as a purchaser and bidding on a unit price for the RECs. One stipulation was that each member of the County's buying group had to be prepared to pay an extra 5% for their energy for it to be certified as renewable.

The County took several steps to ensure that their REC purchase was offsetting some coal power generation. Offsets were shown in Montgomery County in two separate ways, as a paper trail offset and as a physical offset. For the paper trail offset the County showed, via receipts and certificates, that no emissions were given off by their renewable energy purchase. The physical off-set was utilized to show that by using wind energy in Montgomery County, less coal was burned somewhere else. Under the cap and trade system, the emission credits gained from burning less coal can be sold to another energy generator whose emission levels are too high or the credits can be retired and utilized for SIP compliance. Montgomery County chose to utilize both the paper trail and physical offsets in order to maintain credibility of the credits.

The County also took several measures to validate claims that the purchase of wind energy was improving their local air quality. Looking at levels of NOx and volatile organic compounds (VOCs) emissions in the region, a precursor to groundlevel ozone, they found that Maryland did not have the highest level of emissions. However, the County also measured groundlevel ozone and in this instance found Maryland to have the highest levels of ozone in the region. An explanation for this scenario is that NOx point sources are located west of Maryland near the largest power plants in the country and NOx emissions travel from west to east in the country. This study shows that one way to improve air quality in Maryland would be to develop wind plants near the western power plants in an effort to offset some of the demand for the coal plants.

For other municipalities looking to purchase wind energy through RECs, it is important to realize that not all RECs are the same. Each type of REC has certain general attributes that explain what was used to generate it, what type of emissions result from it, the date it was created, and what state or region it was produced in. Where the REC was produced is important because the municipality will not achieve the same economic benefits if the REC was not generated in their home state.

Offset attributes result from the offset of another generation source. The two types of offset attributes are allowances, which are tradable, quantified, and exist only under cap and trade programs, and measurable offsets, which are determined from the next most likely generation source, are difficult to quantify, and are difficult to define ownership of.

Need for Legislative and Regulatory Coordination of:

- Renewable Portfolio Standard;
- Environmental Disclosure Requirements;
- Registry and/or Tracking System for RECs
- Consumer Protection
- Consumer Education

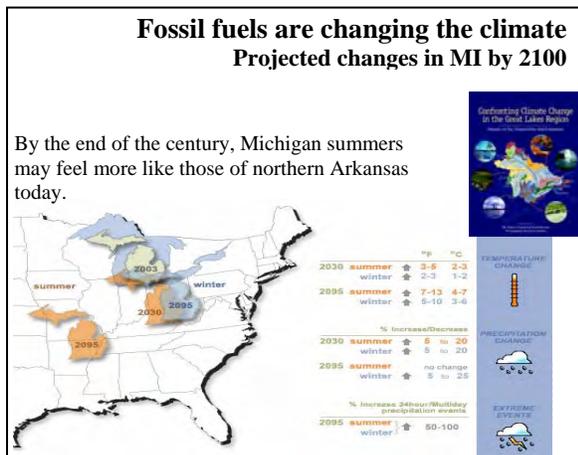
It is also important to separate voluntary and compliance markets for REC purchasing. Customers in the voluntary market purchase RECs because of environmental, political or personal motivations. The compliance market, in contrast, includes only electricity suppliers who purchase RECs to meet a renewable portfolio standard (RPS). It is important to keep these two markets separate because a community REC purchase is excluded from RPS compliance, and the influence of the compliance market damages the structure of the voluntary market, making the voluntary purchase of renewable energy less effective.

In order to keep the REC market viable and credible there need to be separate markets, separate customers, and separate streams of

revenue. This can be achieved with coordination between regulatory and legislative bodies. Development of a tracking system for RECs would help make the market more transparent and protect consumers.

Steve Clemmer - Wind Energy and Compliance in Future Emissions Regimes

The Union of Concerned Scientists believes that the scientific debate over global warming is over and the consensus is that global warming is happening and humans are contributing. The global response to global warming has produced the Kyoto Protocol, EU trading systems, and an acknowledgement at the most recent G8 Summit. U.S. states have responded with regional limits in the form of CO2 limits in California, the New England Regional Greenhouse Gas Initiative, the West Coast Governors Initiative, and renewable energy standards in 21 states and the District of Columbia. Additionally, 174 U.S. cities have agreed to reduce CO2 to the levels mandated in the Kyoto Protocol and a recent Sense of the Senate called for mandatory market-based limits on greenhouse gas emissions.

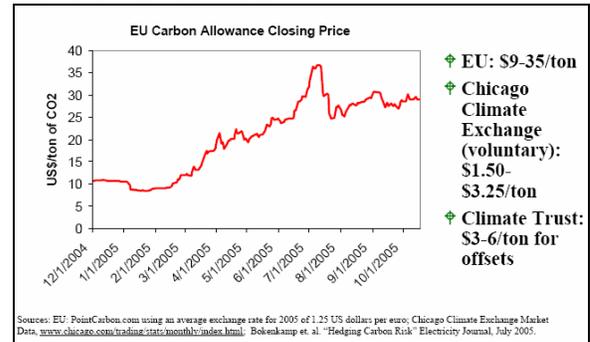


(Source: Steve Clemmer, UCS)

Oil and gas industry leaders, insurance companies, and utilities are beginning to recognize the likelihood of carbon limits and the financial risks they will impose on facilities and consumers alike. General

Electric has pledged to reduce company emissions and 23 global companies, including British Petroleum, British Airways and Ford, have called for a global system to reduce emissions. The cost of CO2 limits have been projected by the U.S. Energy Information Administration (EIA), U.S. Department of Energy (DOE), and others, and carbon allowance market prices are tracked in the European Union and the voluntary Chicago Climate Exchange.

What is the cost of CO2 limits? Current Market Prices



(Source: Steve Clemmer, UCS)

Cost of CO2 compliance will ultimately depend on the level of reductions and availability of affordable low/no carbon alternatives. This situation creates a future market for wind energy, particularly if a national Renewable Energy Standard (RES) is put into effect.

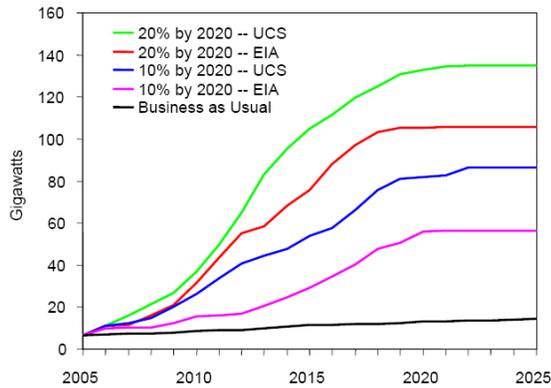
A national Renewable Energy Standard (RES) reduces emission and compliance costs. EIA has developed a plan that requires 20% of the national energy portfolio come from renewable energy and which, if instituted today, would save \$72 billion dollars in total consumer energy bills (not including transportation) by 2020. According to UCS the wind capacity in the U.S. under a 20% RES would increase from approximately 10 gigawatts (GW) to over 130 GW by 2025.

A national RES would change the economics of electricity generation options. New coal plants that are economically feasible without CO2 limits may become too

costly under carbon standards. As support for CO2 reductions increases and states continue to pursue limits on CO2, the prospect for a national RES becomes more of a reality.

The actions of state and local governments in the U.S. indicate that future mandatory limits on greenhouse gases are coming soon. These limits pose financial risks to utilities and ratepayers and will raise cost of fossil fuels to which wind power can provide an affordable hedge. The imposition of CO2 limits at the national, state or local level stands to create a much larger market for wind power in this country.

US wind capacity under a national renewable standard



(Source: UCS, *Renewing America's Economy*, 2004, using EIA model)

About this Issue Forum

The National Wind Coordinating Committee (NWCC) is a collaborative formed in 1994 and comprised of representatives from the utility, wind industry, environmental, consumer, legislatures, and state, federal and tribal government sectors to support the development of an environmentally, economically, and politically sustainable commercial market for wind power.

The issue forum concept was developed to provide members with information about wind interaction topics outside of regularly discussed areas like wildlife, transmission, and siting.

This Brief is intended to make available some of the information from the Issue Forum to NWCC Members, interested parties, and others. Presentations from this session are available online at <http://www.nationalwind.org>.

For more information, or to receive copies of NWCC publications, contact:

National Wind Coordinating Committee
c/o RESOLVE
1255 23rd Street, N.W., Suite 275
Washington, DC 20037
e-mail: nwcc@resolve.org
(888) 764-WIND
www.nationalwind.org

©RESOLVE, Inc. on behalf of the National Wind Coordinating Committee
 All rights reserved.