

PADEP Climate Change Advisory Committee

Report of CCAC Industry and Waste Subcommittee on Work Plans February 27, 2009

At the I&W Subcommittee's meeting of February 18th, various ideas for new work plans were discussed. The basic document used was the attached list prepared by Malcolm Furman of PADEP. Though discussion, the ideas were divided into categories of:

- Ideas that expand existing work plans under consideration
 - Waste-to Energy, MSW
 - Mine Methane
 - Other Waste Issues
- Ideas that will be developed into a new proposed work plan to be reviewed by the Industry and Waste Subcommittee
 - Waste-to Energy, Sludge Digesters
- Ideas that may best be referred to other Subcommittees
 - Telecommuting –
 - Land Use & Transportation,
 - State & Local Government, or
 - Industry & Waste
 - Battery Backup and Load Shaving and Daily Operation –
 - Electricity GTD or
 - Residential & Commercial
 - Solar Thermal Parity –
 - Electricity GTD or
 - Residential & Commercial
 - Efficiency and Effectiveness Upgrade Tax Credits –
 - Industry & Waste or
 - Residential & Commercial
 - Nuclear Power –
 - Electricity GTD

Ideas for CCAC Industry and Waste Subcommittee Meeting 1-14-09
Malcolm Furman 1-13-09

In the last meeting, participants were asked to propose various ideas for discussion. A few had already been spoken about briefly. Here are some thoughts from my toolkit. I hope this is helpful.

Waste-to-Energy, MSW

DEP has been doing extensive work in an effort to include more waste-to-energy projects and volume in the energy mix. It is shown, using an EPA lifecycle measurement tool, that WTE has environmental and GHG performance superior to landfilling [with recycling and gas usage] over the complete materials management lifecycle – including 30% upfront recycling, reprocessing, mining, power generation [fossil fuel avoidance] and other factors. Comparing power generation [viewing the combustion cycle only] to coal shows WTE emitting about 1/3 the GHG of a coal plant. The EPA report Application of the U.S. Decision Support Tool for Materials and Waste Management, by Susan Thorneloe, Keith Weitz, and Jenna Jambeck, 2006 Thorneloe, from EPA, and Weitz, from RTI, have written numerous works on waste and WTE going back into the 1990's. can be found at: <http://www.wte.org/docs/Thorneloe2006.pdf> This report and others can also be accessed through the IWSA site on Greenhouse Gases. http://www.wte.org/environment/greenhouse_gas.html.

Consideration of using waste [as Refuse Derived Fuel] in standard power stations, especially waste coal CFBs, is also considered as a good way to make use of existing capital and gain the environmental advantages from WTE. These projects would meet all current environmental standards. The subcommittee has already mentioned various methods to promote WTE, including additions/modifications to the AEPS, and tax and other financial incentives to the various participants. That a significant amount of energy is present in the waste currently being landfilled is understood. This is usually thought of as electricity or heat, but research is underway to convert trash to liquid fuel. As such, 20-40 million barrels of liquid fuel [diesel] could be created annually from the waste we landfill once that technology becomes viable.

Waste-to-Energy, Sludge Digesters

PA has numerous on-farm digesters. Some of them take local food waste. They generally produce electrical power for farm use and sale, plus 'treated' liquid and solid fertilizers. There are many digesters at sewage treatment plants, but not at all; nor are they all of the same sophistication. Some generate electrical power; and the sludge is managed in ways: from land application, to incineration, to landfilling. Food businesses have a high stake in the costs associated with their waste. An expansion of digestion-to-power along with production of highest-grade solid and liquid end-products has numerous benefits. Additionally, a regional digester model can offer larger scale and higher technology treatment than the basic on-farm or smaller WWTP units can. In the regional model, the business community can participate as both users and investors.

Mine Methane

Several projects have been funded by PA-DEP and US-DOE to utilize mine methane. This material presents challenges because of its often poor heat content, isolated location, and absolute need for miner safety. Initial success has been seen on both concentrated and dilute streams. Encouraging expanded energy recovery from mine methane could result in numerous benefits.

Other Waste Issues

Recycling of some wastes suffers from regulatory and cost barriers. Bringing more wastes into the recycling stream by removing such barriers [diligently] offers numerous energy and environmental benefits.

Telecommuting

Despite resistance from many quarters to telecommuting, it remains of interest. The U.S. government has had a law in place since 2000 to increase its telecommuting population and it monitors performance annually. Some background and compliance information on this law (§ 359 of Public Law 106-346) can be found at <http://www.opm.gov/pandemic/agency2a-guide.pdf> and the OPM/GSA Website www.telework.gov. While the U.S. and state governments can mandate such programs for their departments, perhaps a tax incentive would work better for the business community. These programs do have challenges; the U.S. is still far from the goals set in the law, but it is progressing. I did a rough calculation that, if 10% of the state's 80,000 employees could be teleworking on any one day, about 16,000 gallons of gasoline could be saved daily [x240 days = almost 4 million per year].

Battery Backup as Load Shaving and Daily Operation

"Battery backup" is usually viewed as an emergency system. Recently it is being regarded as a load shaving measure. For example: A residence or business could install a system [which would charge at night during low-cost periods] and this system would then run the site during high-cost periods, typically mid-afternoon. These peak periods impose high and very high pricing, risk straining the grid, cause peak-power plants to turn on, and use a lot of fuel. By charging at night, lower costs are available, spinning reserve could be better-used, and excess wind power could be taken up at value. Additionally, with controls and communication, these systems could be called on in times of need [a high-value proposition], and they would still provide a large measure of backup power. Incentives for utilities and customers could be tailored to encourage adoption.

Solar Thermal Parity

This concept gives solar thermal [solar hot water] systems parity [in an AEPS setting] with PV, based on the equivalent amount of kilowatt hours saved. Utah enacted The Energy Resource and Carbon Emission Reduction Initiative (S.B. 202) in March 2008 offering such an initiative. This type of incentive can be very advantageous to heat-using businesses like laundries and uniform services in that they could then fully participate in AEPS-type mandates and credits. Solar thermal can also be used by industrial boilers in the same way as economizers to recover lower-grade heat for re-use. In a residential setting solar thermal provides about the same economic benefit [cost avoidance] as PV at about 1/3 the system capital cost.

Efficiency and Effectiveness Upgrade Tax Credits

Allow the capital cost of upgrades, to any facility, which result in lower fuel use or lower emissions to receive a [large] tax credit. Also allow any power produced or sold from this upgrade fraction to be exempt from taxes. The purpose of this idea is to remove the risk from proposed capital improvements, to encourage faster adoption of improvements, and to allow firms more comfort to pursue higher [but greater risk] technologies.

Nuclear Power

Large nuclear stations are seeing an enormous worldwide resurgence. Less noticed are the smaller new plant designs like the 4S from Toshiba and the Hyperion reactor, at 10 and 50MW respectively [1MW powers about 1000 homes] and the PBMR at 165MW. For purposes of distributed generation, reliability, and local investment [guaranteed power for local industries] these units might serve well. There are other small designs as well, and information on these may be found at: <http://www.pbmr.co.za/>, and <http://www.nei.org/keyissues/newnuclearplants/newreactordesigns/>.

Advanced Iron and Steel Making

World steelmakers are pursuing new methods of making iron and steel which use less energy and/or result in lower emissions. Providing various tax and economic incentives to such technologies, and to the PA steel industry, would encourage first-deployment of pilot and fullscale units here, along with establishing engineering and fabricating expertise in the Commonwealth.